


## **ANEXO C.06.3**

### **INFORME DEL EFECTO SOMBRAS PRODUCIDO POR LOS AEROGENERADORES**

|  |   |                             |
|--|---|-----------------------------|
|  <b>ICONO SRL</b><br>Tel: (0291) 4556484 - info@iconosrl.com.ar | <b>Estudio de Impacto Ambiental<br/>Adenda</b>              | <b>GREENWIND S.A.</b>       |
| Doc. Nº: CECORTI-IA-2295-06/16   | <b>Central Eólica Corti<br/>Bahía Blanca - Buenos Aires</b> | Fecha: 30/06/2016<br>Rev: A |

## INFORME DEL EFECTO SOMBRAS PRODUCIDO POR LOS AEROGENERADORES

### 1. INTRODUCCIÓN

En el presente informe, se adjunta un documento del programa de cálculo windPRO 3.0.651 *Shadow*, con los resultados obtenidos del efecto sombras producido por los aerogeneradores, en el entorno de la Central Eólica Corti.

El mismo fue suministrado por GREENWIND S.A. y elaborado por VENTUS ENERGÍA S.A.



## SHADOW - Resultado principal

### Cálculo: Restricciones nuevas 14.07

...continúa de la página anterior

|    | hacia Este | hacia Sur | Z    | Datos brutos/Descripción        | Tipo de AG |            |              | Potencia nominal | Diámetro de rotor | Altura buje | Datos de sombra      |       |
|----|------------|-----------|------|---------------------------------|------------|------------|--------------|------------------|-------------------|-------------|----------------------|-------|
|    |            |           |      |                                 | Válido     | Fabricante | Modelo de AG |                  |                   |             | Distancia de cálculo | RPM   |
|    |            |           | [m]  |                                 |            |            | [kW]         | [m]              | [m]               | [m]         | [m]                  | [RPM] |
| 33 | 585 573    | 5 718 868 | 96,3 | GAMESA G114 2650 114.0 !O! h... | Sí         | GAMESA     | G114-2 650   | 2 650            | 114,0             | 93,0        | 2 200                | 0,0   |
| 34 | 584 244    | 5 716 221 | 75,0 | GAMESA G114 2650 114.0 !O! h... | Sí         | GAMESA     | G114-2 650   | 2 650            | 114,0             | 93,0        | 2 200                | 0,0   |
| 35 | 584 535    | 5 716 489 | 77,1 | GAMESA G114 2650 114.0 !O! h... | Sí         | GAMESA     | G114-2 650   | 2 650            | 114,0             | 93,0        | 2 200                | 0,0   |
| 36 | 584 845    | 5 716 809 | 80,2 | GAMESA G114 2650 114.0 !O! h... | Sí         | GAMESA     | G114-2 650   | 2 650            | 114,0             | 93,0        | 2 200                | 0,0   |
| 37 | 585 154    | 5 717 113 | 87,8 | GAMESA G114 2650 114.0 !O! h... | Sí         | GAMESA     | G114-2 650   | 2 650            | 114,0             | 93,0        | 2 200                | 0,0   |
| 38 | 585 431    | 5 717 391 | 90,6 | GAMESA G114 2650 114.0 !O! h... | Sí         | GAMESA     | G114-2 650   | 2 650            | 114,0             | 93,0        | 2 200                | 0,0   |

### Receptor de sombra-Entrada

| Núm.    | Nombre  | hacia Este | hacia Sur | Z    | Anchura | Altura | Altura s.n.t. | Grados desde Sur (sentido reloj) | Inclinación de ventana | Modo de dirección |
|---------|---------|------------|-----------|------|---------|--------|---------------|----------------------------------|------------------------|-------------------|
|         |         |            |           |      | [m]     | [m]    | [m]           | [°]                              | [°]                    |                   |
| Punto 1 | Punto 1 | 583 836    | 5 720 666 | 84,8 | 1,0     | 1,0    | 1,0           | -170,0                           | 90,0                   | Dirección fija    |
| Punto 2 | Punto 2 | 581 808    | 5 718 246 | 87,0 | 1,0     | 1,0    | 1,0           | 0,0                              | 90,0                   | "Modo invernal"   |
| Punto 3 | Punto 3 | 583 406    | 5 718 485 | 96,0 | 1,0     | 1,0    | 1,0           | 0,0                              | 90,0                   | "Modo invernal"   |
| Punto 4 | Punto 4 | 587 478    | 5 717 528 | 95,5 | 1,0     | 1,0    | 1,0           | 0,0                              | 90,0                   | "Modo invernal"   |
| Punto 5 | Punto 5 | 582 023    | 5 717 404 | 86,0 | 1,0     | 1,0    | 1,0           | 0,0                              | 90,0                   | "Modo invernal"   |
| Punto 6 | Punto 6 | 582 283    | 5 716 305 | 77,4 | 1,0     | 1,0    | 1,0           | 0,0                              | 90,0                   | "Modo invernal"   |
| Punto 7 | Punto 7 | 582 782    | 5 715 917 | 82,9 | 1,0     | 1,0    | 1,0           | 0,0                              | 90,0                   | "Modo invernal"   |
| Punto 8 | Punto 8 | 582 862    | 5 715 593 | 81,0 | 1,0     | 1,0    | 1,0           | 0,0                              | 90,0                   | "Modo invernal"   |
| Punto 9 | Punto 9 | 585 444    | 5 721 992 | 93,4 | 1,0     | 1,0    | 1,0           | 0,0                              | 90,0                   | "Modo invernal"   |

### Resultados del cálculo

Receptor de sombra

#### Sombra, caso peor

| Núm.    | Nombre  | Horas de sombra/año | Días de sombra por año | Sombra máx. horas por día |
|---------|---------|---------------------|------------------------|---------------------------|
|         |         | [h/año]             | [días/año]             | [h/día]                   |
| Punto 1 | Punto 1 | 11:52               | 51                     | 0:26                      |
| Punto 2 | Punto 2 | 12:04               | 95                     | 0:14                      |
| Punto 3 | Punto 3 | 0:00                | 0                      | 0:00                      |
| Punto 4 | Punto 4 | 0:39                | 11                     | 0:05                      |
| Punto 5 | Punto 5 | 4:19                | 40                     | 0:11                      |
| Punto 6 | Punto 6 | 9:21                | 76                     | 0:17                      |
| Punto 7 | Punto 7 | 4:36                | 37                     | 0:13                      |
| Punto 8 | Punto 8 | 6:28                | 52                     | 0:13                      |
| Punto 9 | Punto 9 | 0:00                | 0                      | 0:00                      |

Cantidad de Centelleo sobre los receptores de sombra causado por cada AG

| Núm. | Nombre  | Caso peor [h/año] | Esperado [h/año] |
|------|---|-------------------|------------------|
| 1    | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (655) | 0:00              |                  |
| 2    | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (660) | 0:00              |                  |
| 3    | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (661) | 0:00              |                  |
| 4    | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (670) | 10:30             |                  |
| 5    | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (656) | 0:00              |                  |
| 6    | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (664) | 0:00              |                  |
| 7    | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (651) | 7:17              |                  |
| 8    | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (677) | 0:00              |                  |
| 9    | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (665) | 0:00              |                  |
| 10   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (647) | 0:00              |                  |
| 11   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (666) | 0:00              |                  |
| 12   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (667) | 0:00              |                  |
| 13   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (657) | 0:00              |                  |
| 14   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (673) | 1:22              |                  |
| 15   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (678) | 3:21              |                  |
| 16   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (652) | 0:00              |                  |
| 17   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (676) | 0:00              |                  |
| 18   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (668) | 0:00              |                  |
| 19   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (671) | 0:00              |                  |

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## SHADOW - Resultado principal

**Cálculo:** Restricciones nuevas 14.07

...continúa de la página anterior

| Núm. | Nombre  | Caso peor<br>[h/año] | Esperado<br>[h/año] |
|------|---|----------------------|---------------------|
| 20   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (669) | 0:00                 |                     |
| 21   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (672) | 0:00                 |                     |
| 22   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (644) | 0:00                 |                     |
| 23   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (648) | 1:26                 |                     |
| 24   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (640) | 0:00                 |                     |
| 25   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (675) | 0:00                 |                     |
| 26   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (662) | 0:00                 |                     |
| 27   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (642) | 8:54                 |                     |
| 28   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (645) | 4:18                 |                     |
| 29   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (649) | 1:39                 |                     |
| 30   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (653) | 0:00                 |                     |
| 31   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (658) | 0:00                 |                     |
| 32   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (663) | 0:00                 |                     |
| 33   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (674) | 0:00                 |                     |
| 34   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (643) | 8:18                 |                     |
| 35   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (646) | 3:51                 |                     |
| 36   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (650) | 0:00                 |                     |
| 37   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (654) | 0:00                 |                     |
| 38   | GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (659) | 0:39                 |                     |

## SHADOW - Calendario

**Cálculo:** Restricciones nuevas 14.07 **Receptor de sombra:** Punto 1 - Punto 1  
**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                          | Enero          | Febrero        | Marzo          | Abril          | Mayo                   | Junio          |                |
|--------------------------|----------------|----------------|----------------|----------------|------------------------|----------------|----------------|
| 1                        | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:03 | 07:42 (4)<br>08:01 (4) | 07:51<br>18:21 | 08:17<br>17:56 |
| 2                        | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:43 (4)<br>08:00 (4) | 07:51<br>18:20 | 08:18<br>17:55 |
| 3                        | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:44 (4)<br>07:58 (4) | 07:52<br>18:18 | 08:18<br>17:55 |
| 4                        | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:45 (4)<br>07:57 (4) | 07:53<br>18:17 | 08:19<br>17:55 |
| 5                        | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:46 (4)<br>07:54 (4) | 07:54<br>18:16 | 08:19<br>17:54 |
| 6                        | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:47 (4)<br>07:50 (4) | 07:55<br>18:15 | 08:20<br>17:54 |
| 7                        | 05:53<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 |                        | 07:56<br>18:14 | 08:21<br>17:54 |
| 8                        | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 |                        | 07:57<br>18:13 | 08:21<br>17:54 |
| 9                        | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 |                        | 07:58<br>18:12 | 08:22<br>17:54 |
| 10                       | 05:55<br>20:36 | 06:31<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 |                        | 07:59<br>18:11 | 08:22<br>17:54 |
| 11                       | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 |                        | 08:00<br>18:10 | 08:23<br>17:53 |
| 12                       | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:34 | 07:33<br>18:46 |                        | 08:01<br>18:09 | 08:23<br>17:53 |
| 13                       | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:45 |                        | 08:02<br>18:08 | 08:24<br>17:53 |
| 14                       | 06:00<br>20:35 | 06:35<br>20:10 | 07:05<br>19:31 | 07:35<br>18:43 |                        | 08:02<br>18:07 | 08:24<br>17:53 |
| 15                       | 06:01<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:36<br>18:42 |                        | 08:03<br>18:06 | 08:25<br>17:53 |
| 16                       | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 |                        | 08:04<br>18:06 | 08:25<br>17:53 |
| 17                       | 06:03<br>20:34 | 06:39<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 |                        | 08:05<br>18:05 | 08:25<br>17:53 |
| 18                       | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 |                        | 08:06<br>18:04 | 08:26<br>17:54 |
| 19                       | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 |                        | 08:07<br>18:03 | 08:26<br>17:54 |
| 20                       | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 |                        | 08:08<br>18:02 | 08:26<br>17:54 |
| 21                       | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 07:46 (4)              | 08:08<br>18:02 | 08:26<br>17:54 |
| 22                       | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 07:44 (4)              | 08:09<br>18:01 | 08:27<br>17:54 |
| 23                       | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:17 | 07:43<br>18:31 | 07:42 (4)              | 08:10<br>18:00 | 08:27<br>17:55 |
| 24                       | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 07:39 (4)              | 08:11<br>18:00 | 08:27<br>17:55 |
| 25                       | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 07:38 (4)              | 08:12<br>17:59 | 08:27<br>17:55 |
| 26                       | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 07:37 (4)              | 08:12<br>17:59 | 08:27<br>17:55 |
| 27                       | 06:14<br>20:28 | 06:50<br>19:53 | 07:18<br>19:10 | 07:47<br>18:26 | 07:36 (4)              | 08:13<br>17:58 | 08:27<br>17:56 |
| 28                       | 06:15<br>20:27 | 06:51<br>19:51 | 07:19          | 07:48          | 07:35 (4)              | 08:14<br>17:57 | 08:27<br>17:56 |
| 29                       | 06:16<br>20:27 |                | 07:20          | 07:49          | 07:34 (4)              | 08:15<br>17:57 | 08:27<br>17:57 |
| 30                       | 06:18<br>20:26 |                | 07:20          | 07:50          | 07:33 (4)              | 08:15<br>17:57 | 08:27<br>17:57 |
| 31                       | 06:19<br>20:25 |                | 07:21          | 07:51          | 07:32 (4)              | 08:16<br>17:56 |                |
| Horas de sol potenciales | 450            | 380            | 383            | 333            | 73                     | 311            | 285            |
| Total, caso peor         |                | 41             | 239            | 73             |                        |                |                |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

|             |                        |                                  |   |                                       |
|-------------|------------------------|----------------------------------|---|---------------------------------------|
| Día del mes | Salida del sol (hh:mm) | Minutos con sombras de centelleo | Hora inicial (hh:mm), sombras con centelleo | (Primeras sombras de centelleo de AG) |
|             | Puesta de sol (hh:mm)  |                                  | Hora Final (hh:mm), sombras con centelleo   | (Últimas sombras de centelleo de AG)  |

## SHADOW - Calendario

### Cálculo: Restricciones nuevas 14.07 Receptor de sombra: Punto 1 - Punto 1 Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                          | Julio          | Agosto         | Septiembre     | Octubre                | Noviembre      | Diciembre      |
|--------------------------|----------------|----------------|----------------|------------------------|----------------|----------------|
| 1                        | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13         | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                        | 08:27<br>17:58 | 08:10<br>18:20 | 07:31<br>18:47 | 06:43<br>19:14         | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                        | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15         | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                        | 08:27<br>17:59 | 08:08<br>18:22 | 07:28<br>18:49 | 06:40<br>19:16         | 05:58<br>19:48 | 05:38<br>20:20 |
| 5                        | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:17         | 05:57<br>19:49 | 05:38<br>20:21 |
| 6                        | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 07:43 (4)<br>07:46 (4) | 06:37<br>19:17 | 05:55<br>19:50 |
| 7                        | 08:27<br>18:01 | 08:05<br>18:24 | 07:23<br>18:51 | 07:41 (4)<br>07:49 (4) | 06:36<br>19:18 | 05:54<br>19:51 |
| 8                        | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 07:40 (4)<br>07:51 (4) | 06:34<br>19:19 | 05:53<br>19:52 |
| 9                        | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 07:38 (4)<br>07:52 (4) | 06:33<br>19:20 | 05:52<br>19:53 |
| 10                       | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 07:36 (4)<br>07:52 (4) | 06:31<br>19:21 | 05:51<br>19:54 |
| 11                       | 08:25<br>18:03 | 08:01<br>18:28 | 07:17<br>18:55 | 07:35 (4)<br>07:53 (4) | 06:30<br>19:22 | 05:51<br>19:55 |
| 12                       | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 07:33 (4)<br>07:53 (4) | 06:28<br>19:23 | 05:50<br>19:57 |
| 13                       | 08:25<br>18:04 | 07:58<br>18:30 | 07:14<br>18:57 | 07:31 (4)<br>07:53 (4) | 06:27<br>19:24 | 05:49<br>19:58 |
| 14                       | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:58 | 07:30 (4)<br>07:53 (4) | 06:25<br>19:25 | 05:48<br>19:59 |
| 15                       | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 07:28 (4)<br>07:53 (4) | 06:24<br>19:26 | 05:47<br>20:00 |
| 16                       | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 07:27 (4)<br>07:53 (4) | 06:22<br>19:27 | 05:46<br>20:01 |
| 17                       | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 07:26 (4)<br>07:52 (4) | 06:21<br>19:28 | 05:46<br>20:02 |
| 18                       | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 07:26 (4)<br>07:50 (4) | 06:19<br>19:29 | 05:45<br>20:03 |
| 19                       | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 07:27 (4)<br>07:50 (4) | 06:18<br>19:30 | 05:44<br>20:04 |
| 20                       | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 07:27 (4)<br>07:48 (4) | 06:16<br>19:31 | 05:43<br>20:05 |
| 21                       | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 07:29 (4)<br>07:47 (4) | 06:15<br>19:32 | 05:43<br>20:07 |
| 22                       | 08:19<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 07:30 (4)<br>07:44 (4) | 06:14<br>19:33 | 05:42<br>20:08 |
| 23                       | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:06 | 07:33 (4)<br>07:39 (4) | 06:12<br>19:34 | 05:41<br>20:09 |
| 24                       | 08:18<br>18:13 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36         | 06:11<br>19:36 | 05:41<br>20:10 |
| 25                       | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37         | 06:10<br>19:37 | 05:41<br>20:11 |
| 26                       | 08:17<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38         | 06:08<br>19:38 | 05:40<br>20:12 |
| 27                       | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39         | 06:07<br>19:39 | 05:40<br>20:13 |
| 28                       | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40         | 06:06<br>19:40 | 05:39<br>20:14 |
| 29                       | 08:14<br>18:17 | 07:36<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41         | 06:05<br>19:41 | 05:39<br>20:15 |
| 30                       | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42         | 06:03<br>19:42 | 05:39<br>20:16 |
| 31                       | 08:12<br>18:18 | 07:34<br>18:45 | 06:46<br>19:12 | 06:02<br>19:43         | 06:02<br>19:43 | 05:46<br>20:36 |
| Horas de sol potenciales | 302            | 330            | 355            | 406                    | 426            | 459            |
| Total, caso peor         |                |                | 318            | 41                     |                |                |

### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

|             |                        |                                  |   |                                       |
|-------------|------------------------|----------------------------------|---|---------------------------------------|
| Día del mes | Salida del sol (hh:mm) | Minutos con sombras de centelleo | Hora inicial (hh:mm), sombras con centelleo | (Primeras sombras de centelleo de AG) |
|             | Puesta de sol (hh: mm) |                                  | Hora Final (hh:mm), sombras con centelleo   | (Últimas sombras de centelleo de AG)  |

## SHADOW - Calendario

### Cálculo: Restricciones nuevas 14.07Receptor de sombra: Punto 2 - Punto 2 Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                          | Enero          | Febrero        | Marzo         | Abril          | Mayo           | Junio          |  |                    |
|--------------------------|----------------|----------------|---------------|----------------|----------------|----------------|--|--------------------|
| 1                        | 05:47<br>20:37 | 06:20<br>20:24 |               | 06:52<br>19:50 | 07:22<br>19:03 | 07:51<br>18:21 |  | 08:17<br>08:49 (7) |
| 2                        | 05:48<br>20:37 | 06:21<br>20:23 | 6 06:41 (23)  | 06:53<br>19:49 | 07:23<br>19:01 | 07:52<br>18:20 |  | 08:18<br>08:39 (7) |
| 3                        | 05:49<br>20:37 | 06:22<br>20:22 | 6 06:47 (23)  | 06:54<br>19:47 | 07:24<br>19:00 | 07:53<br>18:18 |  | 08:18<br>08:48 (7) |
| 4                        | 05:50<br>20:37 | 06:24<br>20:21 | 7 06:50 (23)  | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 |  | 08:19<br>08:49 (7) |
| 5                        | 05:51<br>20:37 | 06:25<br>20:20 | 7 06:44 (23)  | 06:56<br>19:44 | 07:26<br>18:57 | 07:54<br>18:16 |  | 08:20<br>08:48 (7) |
| 6                        | 05:52<br>20:37 | 06:26<br>20:19 | 6 06:51 (23)  | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 |  | 08:20<br>08:48 (7) |
| 7                        | 05:53<br>20:37 | 06:27<br>20:18 | 6 06:46 (23)  | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 |  | 08:21<br>08:49 (7) |
| 8                        | 05:54<br>20:37 | 06:28<br>20:17 | 5 06:52 (23)  | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 |  | 08:21<br>08:48 (7) |
| 9                        | 05:54<br>20:37 | 06:29<br>20:16 | 4 06:48 (23)  | 07:00<br>19:38 | 07:30<br>18:51 | 07:58<br>18:12 |  | 08:22<br>08:48 (7) |
| 10                       | 05:55<br>20:37 | 06:31<br>20:15 | 8 07:01 (15)  | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 |  | 08:22<br>08:48 (7) |
| 11                       | 05:56<br>20:36 | 06:32<br>20:14 | 11 06:53 (15) | 07:02<br>19:35 | 07:32<br>18:48 | 08:00<br>18:10 |  | 08:23<br>08:45 (7) |
| 12                       | 05:57<br>20:36 | 06:33<br>20:13 | 13 07:05 (15) | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 |  | 08:23<br>08:48 (7) |
| 13                       | 05:59<br>20:36 | 06:34<br>20:11 | 12 07:00 (15) | 07:04<br>19:32 | 07:34<br>18:45 | 08:02<br>18:08 |  | 08:24<br>08:48 (7) |
| 14                       | 06:00<br>20:35 | 06:35<br>20:10 | 12 06:55 (15) | 07:05<br>19:31 | 07:35<br>18:43 | 08:03<br>18:07 |  | 08:24<br>08:48 (7) |
| 15                       | 06:01<br>20:35 | 06:36<br>20:09 | 11 07:06 (15) | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06 |  | 08:25<br>08:48 (7) |
| 16                       | 06:02<br>20:35 | 06:37<br>20:08 | 10 07:07 (15) | 07:07<br>19:28 | 07:37<br>18:40 | 08:04<br>18:06 |  | 08:25<br>08:48 (7) |
| 17                       | 06:03<br>20:34 | 06:39<br>20:07 | 9 06:59 (15)  | 07:08<br>19:26 | 07:38<br>18:39 | 08:05<br>18:05 |  | 08:25<br>08:47 (7) |
| 18                       | 06:04<br>20:34 | 06:40<br>20:05 | 7 07:06 (15)  | 07:09<br>19:24 | 07:38<br>18:38 | 08:06<br>18:04 |  | 08:26<br>08:48 (7) |
| 19                       | 06:05<br>20:33 | 06:41<br>20:04 | 5 07:05 (15)  | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 |  | 08:26<br>08:48 (7) |
| 20                       | 06:06<br>20:33 | 06:42<br>20:03 | 3 07:04 (15)  | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 |  | 08:26<br>08:42 (7) |
| 21                       | 06:07<br>20:32 | 06:43<br>20:01 |               | 07:12<br>19:20 | 07:41<br>18:33 | 7 08:35 (7)    |  | 08:27<br>08:44 (7) |
| 22                       | 06:08<br>20:32 | 06:44<br>20:00 |               | 07:13<br>19:18 | 07:42<br>18:32 | 10 08:34 (7)   |  | 08:27<br>08:33 (7) |
| 23                       | 06:09<br>20:31 | 06:45<br>19:59 |               | 07:14<br>19:17 | 07:43<br>18:31 | 12 08:33 (7)   |  | 08:27<br>08:45 (7) |
| 24                       | 06:11<br>20:30 | 06:46<br>19:57 |               | 07:15<br>19:15 | 07:44<br>18:29 | 13 08:32 (7)   |  | 08:27<br>08:46 (7) |
| 25                       | 06:12<br>20:30 | 06:47<br>19:56 |               | 07:16<br>19:13 | 07:45<br>18:28 | 14 08:31 (7)   |  | 08:27<br>08:33 (7) |
| 26                       | 06:13<br>20:29 | 06:49<br>19:54 |               | 07:17<br>19:12 | 07:46<br>18:27 | 13 08:30 (7)   |  | 08:27<br>08:46 (7) |
| 27                       | 06:14<br>20:28 | 06:50<br>19:53 |               | 07:18<br>19:10 | 07:47<br>18:26 | 13 08:29 (7)   |  | 08:27<br>08:47 (7) |
| 28                       | 06:15<br>20:27 | 06:51<br>19:52 |               | 07:19<br>19:09 | 07:48<br>18:24 | 12 08:28 (7)   |  | 08:27<br>08:48 (7) |
| 29                       | 06:16<br>20:27 |                |               | 07:20<br>19:07 | 07:49<br>18:23 | 12 08:27 (7)   |  | 08:27<br>08:36 (7) |
| 30                       | 06:18<br>20:26 |                |               | 07:21<br>19:06 | 07:50<br>18:22 | 11 08:26 (7)   |  | 08:27<br>08:37 (7) |
| 31                       | 06:19<br>20:25 |                |               | 07:22<br>19:04 |                | 11 08:25 (7)   |  | 08:27<br>08:38 (7) |
| Horas de sol potenciales | 450            | 380            |               | 383            | 333            | 311            |  | 285                |
| Total, caso peor         |                |                | 142           |                |                | 138            |  | 87                 |

### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

|             |                        |                                  |   |   |                                       |                                      |
|-------------|------------------------|----------------------------------|---|---|---------------------------------------|--------------------------------------|
| Día del mes | Salida del sol (hh:mm) | Minutos con sombras de centelleo | Hora inicial (hh:mm), sombras con centelleo | Hora Final (hh:mm), sombras con centelleo | (Primeras sombras de centelleo de AG) | (Últimas sombras de centelleo de AG) |
|-------------|------------------------|----------------------------------|---|---|---------------------------------------|--------------------------------------|



## SHADOW - Calendario

### Cálculo: Restricciones nuevas 14.07 Receptor de sombra: Punto 2 - Punto 2 Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                          | Julio | Agosto       | Septiembre | Octubre | Noviembre | Diciembre     |
|--------------------------|-------|--------------|------------|---------|-----------|---------------|
| 1                        | 08:28 | 08:49 (7)    | 08:11      | 07:32   | 06:45     | 06:01         |
|                          | 17:57 | 3 08:52 (7)  | 18:19      | 18:46   | 19:13     | 11 06:32 (15) |
| 2                        | 08:27 | 08:49 (7)    | 08:10      | 07:31   | 06:43     | 06:19 (23)    |
|                          | 17:58 | 4 08:53 (7)  | 18:20      | 18:47   | 19:14     | 7 06:30 (15)  |
| 3                        | 08:27 | 08:49 (7)    | 08:09      | 07:29   | 06:42     | 05:59         |
|                          | 17:58 | 4 08:53 (7)  | 18:21      | 18:48   | 19:15     | 19:47         |
| 4                        | 08:27 | 08:49 (7)    | 08:08      | 07:28   | 06:40     | 05:58         |
|                          | 17:59 | 5 08:54 (7)  | 18:22      | 18:49   | 19:16     | 19:48         |
| 5                        | 08:27 | 08:49 (7)    | 08:07      | 07:26   | 06:39     | 05:57         |
|                          | 17:59 | 5 08:54 (7)  | 18:23      | 18:50   | 19:17     | 19:49         |
| 6                        | 08:27 | 08:48 (7)    | 08:06      | 07:25   | 06:37     | 05:56         |
|                          | 18:00 | 6 08:54 (7)  | 18:24      | 18:51   | 19:18     | 19:50         |
| 7                        | 08:27 | 08:48 (7)    | 08:05      | 07:23   | 06:36     | 05:54         |
|                          | 18:01 | 7 08:55 (7)  | 18:24      | 18:52   | 19:19     | 19:51         |
| 8                        | 08:26 | 08:48 (7)    | 08:04      | 07:21   | 06:34     | 05:53         |
|                          | 18:01 | 7 08:55 (7)  | 18:25      | 18:52   | 19:20     | 19:52         |
| 9                        | 08:26 | 08:47 (7)    | 08:03      | 07:20   | 06:33     | 05:52         |
|                          | 18:02 | 8 08:55 (7)  | 18:26      | 18:53   | 19:20     | 19:53         |
| 10                       | 08:26 | 08:47 (7)    | 08:02      | 07:18   | 06:31     | 05:52         |
|                          | 18:02 | 9 08:56 (7)  | 18:27      | 18:54   | 19:21     | 19:54         |
| 11                       | 08:25 | 08:47 (7)    | 08:01      | 07:17   | 06:30     | 05:51         |
|                          | 18:03 | 9 08:56 (7)  | 18:28      | 18:55   | 19:22     | 19:56         |
| 12                       | 08:25 | 08:46 (7)    | 07:59      | 07:15   | 06:28     | 05:50         |
|                          | 18:04 | 10 08:56 (7) | 18:29      | 18:56   | 19:23     | 19:57         |
| 13                       | 08:25 | 08:46 (7)    | 07:58      | 07:14   | 06:27     | 05:49         |
|                          | 18:04 | 11 08:57 (7) | 18:30      | 18:57   | 19:24     | 19:58         |
| 14                       | 08:24 | 08:45 (7)    | 07:57      | 07:12   | 06:25     | 05:48         |
|                          | 18:05 | 11 08:56 (7) | 18:31      | 18:58   | 19:25     | 19:59         |
| 15                       | 08:24 | 08:45 (7)    | 07:56      | 07:10   | 06:24     | 05:47         |
|                          | 18:06 | 12 08:57 (7) | 18:31      | 18:59   | 19:26     | 20:00         |
| 16                       | 08:23 | 08:44 (7)    | 07:54      | 07:09   | 06:22     | 05:46         |
|                          | 18:06 | 12 08:56 (7) | 18:32      | 18:59   | 19:27     | 20:01         |
| 17                       | 08:23 | 08:44 (7)    | 07:53      | 07:07   | 06:21     | 05:46         |
|                          | 18:07 | 13 08:57 (7) | 18:33      | 19:00   | 19:28     | 20:02         |
| 18                       | 08:22 | 08:43 (7)    | 07:52      | 07:06   | 06:19     | 05:45         |
|                          | 18:08 | 13 08:56 (7) | 18:34      | 19:01   | 19:29     | 20:03         |
| 19                       | 08:22 | 08:42 (7)    | 07:51      | 07:04   | 06:18     | 05:44         |
|                          | 18:09 | 13 08:55 (7) | 18:35      | 19:02   | 19:30     | 20:04         |
| 20                       | 08:21 | 08:42 (7)    | 07:49      | 07:02   | 06:17     | 05:43         |
|                          | 18:09 | 14 08:56 (7) | 18:36      | 19:03   | 19:31     | 20:06         |
| 21                       | 08:20 | 08:42 (7)    | 07:48      | 07:01   | 06:15     | 05:43         |
|                          | 18:10 | 13 08:55 (7) | 18:37      | 19:04   | 19:33     | 20:07         |
| 22                       | 08:20 | 08:43 (7)    | 07:47      | 06:59   | 06:14     | 06:32 (15)    |
|                          | 18:11 | 11 08:54 (7) | 18:38      | 19:05   | 19:34     | 1 06:33 (15)  |
| 23                       | 08:19 | 08:45 (7)    | 07:45      | 06:58   | 06:12     | 06:31 (15)    |
|                          | 18:12 | 8 08:53 (7)  | 18:38      | 19:06   | 19:35     | 4 06:35 (15)  |
| 24                       | 08:18 | 08:47 (7)    | 07:44      | 06:56   | 06:11     | 06:29 (15)    |
|                          | 18:13 | 4 08:51 (7)  | 18:39      | 19:06   | 19:36     | 6 06:35 (15)  |
| 25                       | 08:17 |              | 07:42      | 06:55   | 06:10     | 06:28 (15)    |
|                          | 18:13 |              | 18:40      | 19:07   | 19:37     | 8 06:36 (15)  |
| 26                       | 08:17 |              | 07:41      | 06:53   | 06:08     | 06:27 (15)    |
|                          | 18:14 |              | 18:41      | 19:08   | 19:38     | 9 06:36 (15)  |
| 27                       | 08:16 |              | 07:39      | 06:51   | 06:07     | 06:26 (15)    |
|                          | 18:15 |              | 18:42      | 19:09   | 19:39     | 10 06:36 (15) |
| 28                       | 08:15 |              | 07:38      | 06:50   | 06:06     | 06:25 (15)    |
|                          | 18:16 |              | 18:43      | 19:10   | 19:40     | 11 06:36 (15) |
| 29                       | 08:14 |              | 07:37      | 06:48   | 06:05     | 06:23 (15)    |
|                          | 18:17 |              | 18:44      | 19:11   | 19:41     | 12 06:35 (15) |
| 30                       | 08:13 |              | 07:35      | 06:47   | 06:03     | 06:22 (15)    |
|                          | 18:18 |              | 18:45      | 19:12   | 19:42     | 13 06:35 (15) |
| 31                       | 08:12 |              | 07:34      |         | 06:02     | 06:21 (15)    |
|                          | 18:18 |              | 18:45      |         | 19:43     | 13 06:34 (15) |
| Horas de sol potenciales | 302   |              |            |         |           |               |
| Total, caso peor         | 212   | 330          | 355        | 406     | 426       | 58            |

#### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

|             |                        |                                  |   |   |                                       |                                      |
|-------------|------------------------|----------------------------------|---|---|---------------------------------------|--------------------------------------|
| Día del mes | Salida del sol (hh:mm) | Minutos con sombras de centelleo | Hora inicial (hh:mm), sombras con centelleo | Hora Final (hh:mm), sombras con centelleo | (Primeras sombras de centelleo de AG) | (Últimas sombras de centelleo de AG) |
|-------------|------------------------|----------------------------------|---|---|---------------------------------------|--------------------------------------|

## SHADOW - Calendario

### Cálculo: Restricciones nuevas 14.07 Receptor de sombra: Punto 3 - Punto 3 Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                          | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|--------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                        | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:03 | 07:51<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                        | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:52<br>18:20 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:31<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                        | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                        | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:28<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48 | 05:38<br>20:20 |
| 5                        | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:20<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:17 | 05:57<br>19:49 | 05:37<br>20:21 |
| 6                        | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 06:37<br>19:18 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                        | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:01 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                        | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                        | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:33<br>19:20 | 05:52<br>19:53 | 05:37<br>20:25 |
| 10                       | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                       | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:01<br>18:28 | 07:17<br>18:55 | 06:30<br>19:22 | 05:51<br>19:55 | 05:37<br>20:26 |
| 12                       | 05:57<br>20:36 | 06:33<br>20:13 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:57 | 05:37<br>20:27 |
| 13                       | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:45 | 08:02<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:30 | 07:14<br>18:57 | 06:27<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                       | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:31 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:58 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                       | 06:01<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 08:24<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                       | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:37<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                       | 06:03<br>20:34 | 06:39<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:31 |
| 18                       | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:54 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                       | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:22<br>18:09 | 07:51<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                       | 06:06<br>20:33 | 06:42<br>20:03 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:06 | 05:40<br>20:32 |
| 21                       | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:27<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                       | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:20<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                       | 06:09<br>20:31 | 06:45<br>19:59 | 07:14<br>19:17 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:55 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:06 | 06:12<br>19:35 | 05:42<br>20:09 | 05:41<br>20:34 |
| 24                       | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                       | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:41<br>20:11 | 05:42<br>20:35 |
| 26                       | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:13<br>17:58 | 08:27<br>17:55 | 08:17<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                       | 06:14<br>20:28 | 06:50<br>19:53 | 07:18<br>19:10 | 07:47<br>18:26 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                       | 06:15<br>20:27 | 06:51<br>19:52 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:28<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                       | 06:16<br>20:27 |                | 07:20<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:28<br>17:57 | 08:14<br>18:17 | 07:37<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                       | 06:18<br>20:26 |                | 07:21<br>19:06 | 07:50<br>18:22 | 08:16<br>17:56 | 08:28<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:47<br>19:12 | 06:03<br>19:42 | 05:39<br>20:16 | 05:46<br>20:36 |
| 31                       | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:34<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Total, caso peor         |                |                |                |                |                |                |                |                |                |                |                |                |

Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

|             |                        |                                  |   |                                       |
|-------------|------------------------|----------------------------------|---|---------------------------------------|
| Día del mes | Salida del sol (hh:mm) |                                  | Hora inicial (hh:mm), sombras con centelleo | (Primeras sombras de centelleo de AG) |
|             | Puesta de sol (hh:mm)  | Minutos con sombras de centelleo | Hora Final (hh:mm), sombras con centelleo   | (Últimas sombras de centelleo de AG)  |

## SHADOW - Calendario

### Cálculo: Restricciones nuevas 14.07 Receptor de sombra: Punto 4 - Punto 4 Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

- Hace sol todo el día, desde la salida hasta la puesta del sol
- El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol
- El AG está siempre en operación

|                          | Enero          | Febrero        | Marzo          | Abril               | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre           | Diciembre      |
|--------------------------|----------------|----------------|----------------|---------------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------------|----------------|
| 1                        | 05:47<br>20:37 | 06:20<br>20:24 | 06:51<br>19:50 | 07:22<br>19:02      | 07:50<br>18:20 | 08:17<br>17:55 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44      | 05:38<br>20:17 |
| 2                        | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:48 | 07:23<br>19:01      | 07:51<br>18:19 | 08:17<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:30<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45      | 05:38<br>20:18 |
| 3                        | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59      | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46      | 05:38<br>20:19 |
| 4                        | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 19:21 (38)<br>07:25 | 07:53<br>18:58 | 08:19<br>18:17 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:15 | 05:57<br>19:47      | 05:37<br>20:20 |
| 5                        | 05:50<br>20:37 | 06:24<br>20:20 | 06:56<br>19:44 | 19:19 (38)<br>07:26 | 07:54<br>18:56 | 08:19<br>18:16 | 08:27<br>17:59 | 08:07<br>18:22 | 07:26<br>18:50 | 06:38<br>19:16 | 18:53 (38)<br>05:56 | 05:37<br>19:49 |
| 6                        | 05:51<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 19:24 (38)<br>07:27 | 07:55<br>18:55 | 08:20<br>18:15 | 08:27<br>17:54 | 08:06<br>18:23 | 07:24<br>18:50 | 06:37<br>19:17 | 18:53 (38)<br>05:55 | 05:37<br>19:50 |
| 7                        | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 19:22 (38)<br>07:28 | 07:56<br>18:53 | 08:21<br>18:14 | 08:26<br>17:54 | 08:05<br>18:00 | 07:23<br>18:24 | 06:35<br>19:18 | 18:53 (38)<br>05:54 | 05:37<br>19:51 |
| 8                        | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 19:21 (38)<br>07:29 | 07:57<br>18:52 | 08:21<br>18:13 | 08:26<br>17:54 | 08:04<br>18:01 | 07:21<br>18:52 | 06:34<br>19:19 | 18:53 (38)<br>05:53 | 05:37<br>19:52 |
| 9                        | 05:54<br>20:36 | 06:29<br>20:16 | 07:00<br>19:38 | 19:19 (38)<br>07:30 | 07:58<br>18:50 | 08:22<br>18:12 | 08:26<br>17:53 | 08:03<br>18:02 | 07:20<br>18:53 | 06:32<br>19:20 | 18:54 (38)<br>05:52 | 05:37<br>20:24 |
| 10                       | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 19:18 (38)<br>07:31 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 18:59 (38)<br>05:51 | 05:37<br>19:54 |
| 11                       | 05:56<br>20:36 | 06:31<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47      | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:00<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55      | 05:37<br>20:26 |
| 12                       | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:33 | 07:33<br>18:46      | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:03 | 07:59<br>18:28 | 07:15<br>18:56 | 06:28<br>19:23 | 05:49<br>19:56      | 05:37<br>20:27 |
| 13                       | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:44      | 08:01<br>18:08 | 08:24<br>17:53 | 08:24<br>18:04 | 07:58<br>18:29 | 07:13<br>18:56 | 06:26<br>19:24 | 05:49<br>19:58      | 05:37<br>20:28 |
| 14                       | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:30 | 07:34<br>18:43      | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:57 | 06:25<br>19:25 | 05:48<br>19:59      | 05:38<br>20:28 |
| 15                       | 06:00<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:35<br>18:41      | 08:03<br>18:06 | 08:24<br>17:53 | 08:24<br>18:05 | 07:56<br>18:31 | 07:10<br>18:58 | 06:23<br>19:26 | 05:47<br>20:00      | 05:38<br>20:29 |
| 16                       | 06:01<br>20:34 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40      | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:09<br>18:32 | 06:22<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01      | 05:38<br>20:30 |
| 17                       | 06:02<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39      | 08:05<br>18:04 | 08:25<br>17:53 | 08:22<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:20<br>19:28 | 05:45<br>20:02      | 05:38<br>20:30 |
| 18                       | 06:04<br>20:34 | 06:39<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37      | 08:06<br>18:04 | 08:26<br>17:53 | 08:22<br>18:08 | 07:52<br>18:34 | 07:05<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03      | 05:39<br>20:31 |
| 19                       | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36      | 08:07<br>18:03 | 08:26<br>17:53 | 08:21<br>18:08 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04      | 05:39<br>20:32 |
| 20                       | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35      | 08:07<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05      | 05:39<br>20:32 |
| 21                       | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:19 | 07:41<br>18:33      | 08:08<br>18:01 | 08:26<br>17:54 | 08:20<br>18:10 | 07:48<br>18:36 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:06      | 05:40<br>20:33 |
| 22                       | 06:08<br>20:31 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32      | 08:09<br>18:01 | 08:27<br>17:54 | 08:19<br>18:11 | 07:46<br>18:37 | 06:59<br>19:04 | 06:14<br>19:33 | 05:42<br>20:08      | 05:40<br>20:33 |
| 23                       | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:30      | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:11 | 07:45<br>18:38 | 06:57<br>19:05 | 06:12<br>19:34 | 05:41<br>20:09      | 05:41<br>20:34 |
| 24                       | 06:10<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29      | 08:11<br>17:59 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:35 | 05:41<br>20:10      | 05:41<br>20:34 |
| 25                       | 06:12<br>20:29 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28      | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:36 | 05:40<br>20:11      | 05:42<br>20:35 |
| 26                       | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27      | 08:12<br>17:58 | 08:27<br>17:55 | 08:16<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12      | 05:43<br>20:35 |
| 27                       | 06:14<br>20:28 | 06:49<br>19:53 | 07:17<br>19:10 | 07:47<br>18:25      | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:39<br>20:13      | 05:43<br>20:35 |
| 28                       | 06:15<br>20:27 | 06:50<br>19:51 | 07:18<br>19:09 | 07:48<br>18:24      | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:14 | 07:38<br>18:43 | 06:49<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14      | 05:44<br>20:36 |
| 29                       | 06:16<br>20:26 | 06:51<br>19:50 | 07:19<br>19:07 | 07:49<br>18:23      | 08:15<br>17:57 | 08:27<br>17:56 | 08:14<br>18:16 | 07:36<br>18:43 | 06:48<br>19:11 | 06:04<br>19:41 | 05:39<br>20:15      | 05:45<br>20:36 |
| 30                       | 06:17<br>20:26 | 06:52<br>19:50 | 07:20<br>19:05 | 07:49<br>18:22      | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:38<br>20:16      | 05:45<br>20:36 |
| 31                       | 06:19<br>20:25 | 06:53<br>19:04 | 07:21<br>19:04 | 07:50<br>18:21      | 08:16<br>17:56 | 08:28<br>17:57 | 08:12<br>18:18 | 07:33<br>18:45 | 06:02<br>19:43 | 06:02<br>19:43 | 05:46<br>20:16      | 05:46<br>20:36 |
| Horas de sol potenciales | 450            | 380            | 383            | 333                 | 311            | 285            | 302            | 330            | 355            | 406            | 426                 | 459            |
| Total, caso peor         |                |                | 21             |                     |                |                |                |                | 18             |                |                     |                |

### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

|             |                        |                       |                                  |   |   |                                       |                                      |
|-------------|------------------------|-----------------------|----------------------------------|---|---|---------------------------------------|--------------------------------------|
| Día del mes | Salida del sol (hh:mm) | Puesta de sol (hh:mm) | Minutos con sombras de centelleo | Hora inicial (hh:mm), sombras con centelleo | Hora Final (hh:mm), sombras con centelleo | (Primeras sombras de centelleo de AG) | (Últimas sombras de centelleo de AG) |
|-------------|------------------------|-----------------------|----------------------------------|---|---|---------------------------------------|--------------------------------------|

## SHADOW - Calendario

### Cálculo: Restricciones nuevas 14.07 Receptor de sombra: Punto 5 - Punto 5 Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

- Hace sol todo el día, desde la salida hasta la puesta del sol
- El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol
- El AG está siempre en operación

|    | Enero                    | Febrero       | Marzo         | Abril | Mayo  | Junio | Julio | Agosto | Septiembre | Octubre | Noviembre | Diciembre  |               |       |
|----|--------------------------|---------------|---------------|-------|-------|-------|-------|--------|------------|---------|-----------|------------|---------------|-------|
| 1  | 05:47                    | 06:20         | 06:40 (27)    | 06:52 | 07:22 | 07:51 | 08:17 | 08:28  | 08:11      | 07:32   | 06:45     | 06:01      | 05:38         |       |
| 2  | 20:37                    | 20:24         | 11 06:51 (27) | 19:50 | 19:03 | 18:21 | 17:56 | 17:57  | 18:19      | 18:46   | 19:13     | 19:44      | 20:17         |       |
| 3  | 05:48                    | 06:21         | 06:41 (27)    | 06:53 | 07:23 | 07:52 | 08:18 | 08:28  | 08:10      | 07:31   | 06:43     | 06:00      | 06:19 (27)    | 05:38 |
| 4  | 20:37                    | 20:23         | 10 06:51 (27) | 19:49 | 19:01 | 18:20 | 17:55 | 17:58  | 18:20      | 18:47   | 19:14     | 19:45      | 2 06:21 (27)  | 20:18 |
| 5  | 05:49                    | 06:22         | 06:43 (27)    | 06:54 | 07:24 | 07:53 | 08:18 | 08:27  | 08:09      | 07:29   | 06:42     | 05:59      | 06:18 (27)    | 05:38 |
| 6  | 20:37                    | 20:22         | 10 06:53 (27) | 19:47 | 19:00 | 18:18 | 17:55 | 17:58  | 18:21      | 18:48   | 19:15     | 19:47      | 4 06:22 (27)  | 20:19 |
| 7  | 05:50                    | 06:24         | 06:44 (27)    | 06:55 | 07:25 | 07:53 | 08:19 | 08:27  | 08:08      | 07:28   | 06:40     | 05:58      | 06:17 (27)    | 05:38 |
| 8  | 20:37                    | 20:21         | 9 06:53 (27)  | 19:46 | 18:58 | 18:17 | 17:55 | 17:59  | 18:22      | 18:49   | 19:16     | 19:48      | 5 06:22 (27)  | 20:20 |
| 9  | 05:51                    | 06:25         | 06:45 (27)    | 06:56 | 07:26 | 07:54 | 08:20 | 08:27  | 08:07      | 07:26   | 06:39     | 05:57      | 06:16 (27)    | 05:37 |
| 10 | 20:37                    | 20:20         | 8 06:53 (27)  | 19:44 | 18:57 | 18:16 | 17:54 | 17:59  | 18:23      | 18:50   | 19:17     | 19:49      | 7 06:23 (27)  | 20:21 |
| 11 | 05:52                    | 06:26         | 06:46 (27)    | 06:57 | 07:27 | 07:55 | 08:20 | 08:27  | 08:06      | 07:25   | 06:37     | 05:55      | 06:15 (27)    | 05:37 |
| 12 | 20:37                    | 20:19         | 7 06:53 (27)  | 19:43 | 18:55 | 18:15 | 17:54 | 18:00  | 18:23      | 18:51   | 19:18     | 19:50      | 8 06:23 (27)  | 20:22 |
| 13 | 05:53                    | 06:27         | 06:47 (27)    | 06:58 | 07:28 | 07:56 | 08:21 | 08:27  | 08:05      | 07:23   | 06:36     | 05:54      | 06:14 (27)    | 05:37 |
| 14 | 20:37                    | 20:18         | 5 06:52 (27)  | 19:41 | 18:53 | 18:14 | 17:54 | 18:01  | 18:24      | 18:52   | 19:19     | 19:51      | 9 06:23 (27)  | 20:23 |
| 15 | 05:53                    | 06:28         | 06:48 (27)    | 06:59 | 07:29 | 07:57 | 08:21 | 08:26  | 08:04      | 07:21   | 06:34     | 05:53      | 06:13 (27)    | 05:37 |
| 16 | 20:37                    | 20:17         | 3 06:51 (27)  | 19:40 | 18:52 | 18:13 | 17:54 | 18:01  | 18:25      | 18:52   | 19:20     | 19:52      | 10 06:23 (27) | 20:24 |
| 17 | 05:54                    | 06:29         | 06:50 (27)    | 07:00 | 07:30 | 07:58 | 08:22 | 08:26  | 08:03      | 07:20   | 06:33     | 05:52      | 06:12 (27)    | 05:37 |
| 18 | 20:37                    | 20:16         | 1 06:51 (27)  | 19:38 | 18:50 | 18:12 | 17:54 | 18:02  | 18:26      | 18:53   | 19:20     | 19:53      | 10 06:22 (27) | 20:25 |
| 19 | 05:55                    | 06:31         | 07:01         | 07:31 | 07:59 | 08:22 | 08:26 | 08:26  | 08:02      | 07:18   | 06:31     | 05:51      | 06:11 (27)    | 05:37 |
| 20 | 20:37                    | 20:15         | 19:37         | 18:49 | 18:11 | 17:54 | 18:02 | 18:02  | 18:27      | 18:54   | 19:21     | 19:54      | 11 06:23 (27) | 20:25 |
| 21 | 05:56                    | 06:32         | 07:02         | 07:32 | 08:00 | 08:23 | 08:25 | 08:25  | 08:01      | 07:17   | 06:30     | 05:51      | 06:10 (27)    | 05:37 |
| 22 | 20:36                    | 20:14         | 19:35         | 18:48 | 18:10 | 17:53 | 18:03 | 18:03  | 18:28      | 18:55   | 19:22     | 19:56      | 11 06:21 (27) | 20:26 |
| 23 | 05:57                    | 06:33         | 07:03         | 07:33 | 08:01 | 08:23 | 08:25 | 08:25  | 07:59      | 07:15   | 06:28     | 05:50      | 06:10 (27)    | 05:38 |
| 24 | 20:36                    | 20:13         | 19:34         | 18:46 | 18:09 | 17:53 | 18:04 | 18:29  | 18:29      | 18:56   | 19:23     | 19:57      | 9 06:19 (27)  | 20:27 |
| 25 | 05:58                    | 06:34         | 07:04         | 07:34 | 08:02 | 08:24 | 08:25 | 08:25  | 07:58      | 07:14   | 06:27     | 05:49      | 06:13 (27)    | 05:38 |
| 26 | 20:36                    | 20:11         | 19:32         | 18:45 | 18:08 | 17:53 | 18:04 | 18:30  | 18:30      | 18:57   | 19:24     | 19:58      | 5 06:18 (27)  | 20:28 |
| 27 | 06:00                    | 06:35         | 07:05         | 07:35 | 08:03 | 08:24 | 08:24 | 07:57  | 07:12      | 06:25   | 05:48     | 05:48      | 05:38         | 20:29 |
| 28 | 20:35                    | 20:10         | 19:31         | 18:43 | 18:07 | 17:53 | 18:05 | 18:30  | 18:58      | 19:25   | 19:59     | 05:47      | 05:38         | 20:29 |
| 29 | 06:01                    | 06:36         | 07:06         | 07:36 | 08:03 | 08:25 | 08:24 | 07:56  | 07:10      | 06:24   | 05:48     | 05:38      | 05:38         | 20:29 |
| 30 | 20:35                    | 20:09         | 19:29         | 18:42 | 18:06 | 17:53 | 18:06 | 18:31  | 18:58      | 19:26   | 19:52     | 05:46      | 05:38         | 20:29 |
| 31 | 06:02                    | 06:37         | 07:07         | 07:37 | 08:04 | 08:25 | 08:23 | 07:54  | 07:09      | 06:22   | 05:46     | 05:38      | 05:38         | 20:29 |
| 32 | 20:35                    | 20:08         | 19:28         | 18:40 | 18:06 | 17:53 | 18:06 | 18:32  | 18:59      | 19:27   | 19:53     | 05:46      | 05:38         | 20:30 |
| 33 | 06:03                    | 06:39         | 07:08         | 07:38 | 08:05 | 08:25 | 08:23 | 07:53  | 07:07      | 06:21   | 05:46     | 05:39      | 05:39         | 20:31 |
| 34 | 20:34                    | 20:07         | 19:26         | 18:39 | 18:05 | 17:53 | 18:07 | 18:33  | 19:00      | 19:28   | 19:54     | 05:46      | 05:39         | 20:31 |
| 35 | 06:04                    | 06:40         | 07:09         | 07:38 | 08:06 | 08:26 | 08:22 | 07:52  | 07:06      | 06:19   | 05:46     | 05:39      | 05:39         | 20:31 |
| 36 | 20:34                    | 20:05         | 19:24         | 18:38 | 18:04 | 17:54 | 18:08 | 18:34  | 19:01      | 19:29   | 19:55     | 05:46      | 05:39         | 20:31 |
| 37 | 06:05                    | 06:41         | 07:10         | 07:39 | 08:07 | 08:26 | 08:22 | 07:51  | 07:04      | 06:18   | 05:46     | 05:39      | 05:39         | 20:31 |
| 38 | 20:33                    | 20:04         | 19:23         | 18:36 | 18:03 | 17:54 | 18:09 | 18:35  | 19:02      | 19:30   | 19:56     | 05:46      | 05:39         | 20:32 |
| 39 | 06:06                    | 06:42         | 07:11         | 07:40 | 08:08 | 08:26 | 08:21 | 07:49  | 07:02      | 06:17   | 05:46     | 05:40      | 05:40         | 20:32 |
| 40 | 20:33                    | 20:03         | 5 07:08 (28)  | 19:21 | 18:35 | 18:02 | 17:54 | 18:09  | 18:36      | 19:03   | 19:31     | 19:57      | 05:40         | 20:32 |
| 41 | 06:01                    | 06:36         | 07:03 (28)    | 07:12 | 07:41 | 08:09 | 08:27 | 08:20  | 07:48      | 07:01   | 06:15     | 05:40      | 05:40         | 20:32 |
| 42 | 20:32                    | 20:01         | 7 07:10 (28)  | 19:20 | 18:33 | 18:02 | 17:54 | 18:10  | 18:37      | 19:04   | 19:33     | 19:59      | 05:40         | 20:33 |
| 43 | 06:08                    | 06:44         | 07:04 (28)    | 07:13 | 07:42 | 08:09 | 08:27 | 08:20  | 07:47      | 06:59   | 06:14     | 05:41      | 05:41         | 20:33 |
| 44 | 20:32                    | 20:00         | 7 07:11 (28)  | 19:18 | 18:32 | 18:01 | 17:54 | 18:11  | 18:38      | 19:05   | 19:34     | 19:60 (28) | 05:41         | 20:33 |
| 45 | 06:09                    | 06:45         | 07:05 (28)    | 07:14 | 07:43 | 08:10 | 08:27 | 08:19  | 07:45      | 06:58   | 06:12     | 05:42      | 05:41         | 20:33 |
| 46 | 20:31                    | 19:59         | 6 07:11 (28)  | 19:17 | 18:31 | 18:00 | 17:55 | 18:12  | 18:38      | 19:06   | 19:35     | 20:09      | 05:41         | 20:34 |
| 47 | 06:11                    | 06:46         | 07:06 (28)    | 07:15 | 07:44 | 08:11 | 08:27 | 08:18  | 07:44      | 06:56   | 06:11     | 05:41      | 05:41         | 20:34 |
| 48 | 20:30                    | 19:57         | 6 07:12 (28)  | 19:15 | 18:29 | 18:00 | 17:55 | 18:13  | 18:39      | 19:06   | 19:36     | 20:10      | 05:41         | 20:34 |
| 49 | 06:12                    | 06:47         | 07:07 (28)    | 07:16 | 07:45 | 08:12 | 08:27 | 08:17  | 07:42      | 06:55   | 06:10     | 05:41      | 05:41         | 20:34 |
| 50 | 20:30                    | 19:56         | 4 07:11 (28)  | 19:13 | 18:28 | 17:59 | 17:55 | 18:13  | 18:40      | 19:07   | 19:37     | 20:11      | 05:41         | 20:35 |
| 51 | 06:13                    | 06:49         | 07:08 (28)    | 07:17 | 07:46 | 08:13 | 08:27 | 08:17  | 07:41      | 06:53   | 06:08     | 05:40      | 05:43         | 20:35 |
| 52 | 20:29                    | 19:54         | 3 07:11 (28)  | 19:12 | 18:27 | 17:59 | 17:55 | 18:14  | 18:41      | 19:08   | 19:38     | 20:12      | 05:43         | 20:35 |
| 53 | 06:14                    | 06:50         | 07:10 (28)    | 07:18 | 07:47 | 08:13 | 08:28 | 08:16  | 07:39      | 06:51   | 06:07     | 05:40      | 05:43         | 20:36 |
| 54 | 20:28                    | 19:53         | 1 07:11 (28)  | 19:10 | 18:26 | 17:58 | 17:56 | 18:15  | 18:42      | 19:09   | 19:39     | 20:13      | 05:43         | 20:36 |
| 55 | 06:15                    | 06:51         | 07:19         | 07:48 | 08:14 | 08:28 | 08:15 | 07:38  | 06:50      | 06:06   | 05:39     | 05:39      | 05:44         | 20:36 |
| 56 | 20:27                    | 19:52         | 19:09         | 18:24 | 17:57 | 17:56 | 18:16 | 18:43  | 19:10      | 19:40   | 20:14     | 05:44      | 05:44         | 20:36 |
| 57 | 06:16                    | 06:40 (27)    | 07:20         | 07:49 | 08:15 | 08:28 | 08:14 | 07:37  | 06:48      | 06:05   | 05:39     | 05:39      | 05:45         | 20:36 |
| 58 | 20:27                    | 6 06:46 (27)  | 19:07         | 18:23 | 17:57 | 17:57 | 18:17 | 18:44  | 19:11      | 19:41   | 20:15     | 05:45      | 05:45         | 20:36 |
| 59 | 06:18                    | 06:38 (27)    | 07:21         | 07:50 | 08:16 | 08:28 | 08:13 | 07:35  | 06:47      | 06:03   | 05:39     | 05:39      | 05:46         | 20:36 |
| 60 | 20:26                    | 10 06:48 (27) | 19:06         | 18:22 | 17:57 | 17:57 | 18:17 | 18:45  | 19:12      | 19:42   | 20:16     | 05:46      | 05:46         | 20:36 |
| 61 | 06:19                    | 06:39 (27)    | 07:22         | 07:51 | 08:16 | 08:28 | 08:12 | 07:34  | 06:47      | 06:02   | 05:39     | 05:46      | 05:46         | 20:37 |
| 62 | 20:25                    | 11 06:50 (27) | 19:04         | 18:20 | 17:56 | 17:56 | 18:18 | 18:45  | 19:12      | 19:43   | 20:17     | 05:46      | 05:46         | 20:37 |
| 63 | Horas de sol potenciales | 450           | 380           | 383   | 333   | 311   | 285   | 302    | 330        | 355     | 406       | 38         | 426           | 459   |
| 64 | Total, caso peor         | 27            | 103           | 383   | 333   | 311   | 285   | 302    | 330        | 355     | 406       | 38         | 426           | 459   |

### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

|             |                        |                       |                                  |   |   |                                       |                                      |
|-------------|------------------------|-----------------------|----------------------------------|---|---|---------------------------------------|--------------------------------------|
| Día del mes | Salida del sol (hh:mm) | Puesta de sol (hh:mm) | Minutos con sombras de centelleo | Hora inicial (hh:mm), sombras con centelleo | Hora Final (hh:mm), sombras con centelleo | (Primeras sombras de centelleo de AG) | (Últimas sombras de centelleo de AG) |
|-------------|------------------------|-----------------------|----------------------------------|---|---|---------------------------------------|--------------------------------------|

## SHADOW - Calendario

### Cálculo: Restricciones nuevas 14.07 Receptor de sombra: Punto 6 - Punto 6 Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                          | Enero          | Febrero        | Marzo          | Abril          | Mayo                | Junio               |
|--------------------------|----------------|----------------|----------------|----------------|---------------------|---------------------|
| 1                        | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:03 | 07:51<br>18:21      | 08:12 (27)<br>17:56 |
| 2                        | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:52<br>18:20      | 08:12 (27)<br>17:55 |
| 3                        | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>19:00 | 07:53<br>18:18      | 08:13 (27)<br>17:55 |
| 4                        | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17      | 08:14 (27)<br>17:55 |
| 5                        | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16      | 08:15 (27)<br>17:54 |
| 6                        | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15      | 08:16 (27)<br>17:54 |
| 7                        | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14      | 08:17 (27)<br>17:54 |
| 8                        | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13      | 08:18 (27)<br>17:54 |
| 9                        | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12      | 08:19 (27)<br>17:54 |
| 10                       | 05:55<br>20:37 | 06:31<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11      | 08:20 (27)<br>17:53 |
| 11                       | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:48 | 08:00<br>18:10      | 08:21 (27)<br>17:53 |
| 12                       | 05:57<br>20:36 | 06:33<br>20:13 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09      | 08:22 (27)<br>17:53 |
| 13                       | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:45 | 08:02<br>18:08      | 08:23 (27)<br>17:53 |
| 14                       | 05:59<br>20:36 | 06:35<br>20:10 | 07:05<br>19:31 | 07:35<br>18:43 | 08:03<br>18:07      | 08:23 (28)<br>17:53 |
| 15                       | 06:01<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06      | 08:24 (28)<br>17:53 |
| 16                       | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:28 | 07:37<br>18:40 | 08:04<br>18:05      | 08:25 (28)<br>17:53 |
| 17                       | 06:03<br>20:34 | 06:39<br>20:07 | 07:08<br>19:26 | 07:38<br>18:39 | 08:05<br>18:05      | 08:25<br>17:53      |
| 18                       | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04      | 08:28 (29)<br>17:54 |
| 19                       | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03      | 08:28 (29)<br>17:54 |
| 20                       | 06:06<br>20:33 | 06:42<br>20:03 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02      | 08:29 (29)<br>17:54 |
| 21                       | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:09<br>18:02      | 08:30 (29)<br>17:54 |
| 22                       | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01      | 08:31 (29)<br>17:54 |
| 23                       | 06:09<br>20:31 | 06:45<br>19:59 | 07:14<br>19:17 | 07:43<br>18:31 | 08:10<br>18:00      | 08:32 (29)<br>17:55 |
| 24                       | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00      | 08:32 (29)<br>17:55 |
| 25                       | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59      | 08:33 (29)<br>17:55 |
| 26                       | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:13<br>17:58      | 08:34 (29)<br>17:55 |
| 27                       | 06:14<br>20:28 | 06:50<br>19:53 | 07:18<br>19:10 | 07:47<br>18:26 | 08:13<br>17:58      | 08:37 (29)<br>17:56 |
| 28                       | 06:15<br>20:28 | 06:51<br>19:52 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57      | 08:36 (29)<br>17:56 |
| 29                       | 06:16<br>20:27 |                | 07:20<br>19:07 | 07:49<br>18:23 | 08:14 (27)<br>17:57 | 08:36 (29)<br>17:57 |
| 30                       | 06:18<br>20:26 |                | 07:21<br>19:06 | 07:50<br>18:22 | 08:26 (27)<br>17:57 | 08:37 (29)<br>17:57 |
| 31                       | 06:19<br>20:25 |                | 07:22<br>19:04 |                | 08:13 (27)<br>17:56 | 08:16<br>17:57      |
| Horas de sol potenciales | 450            | 380            | 383            | 333            | 311                 | 285                 |
| Total, caso peor         |                |                | 32             | 33             | 214                 |                     |

#### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

|             |                        |                                  |   |                                       |
|-------------|------------------------|----------------------------------|---|---------------------------------------|
| Día del mes | Salida del sol (hh:mm) | Minutos con sombras de centelleo | Hora inicial (hh:mm), sombras con centelleo | (Primeras sombras de centelleo de AG) |
|             | Puesta de sol (hh:mm)  |                                  | Hora Final (hh:mm), sombras con centelleo   | (Últimas sombras de centelleo de AG)  |

## SHADOW - Calendario

### Cálculo: Restricciones nuevas 14.07 Receptor de sombra: Punto 6 - Punto 6 Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                          | Julio          | Agosto                   | Septiembre                  | Octubre        | Noviembre      | Diciembre                  |                |
|--------------------------|----------------|--------------------------|-----------------------------|----------------|----------------|----------------------------|----------------|
| 1                        | 08:28<br>17:57 | 08:11<br>18:19           | 8 08:32 (27)<br>08:40 (28)  | 07:32<br>18:46 | 06:45<br>19:13 | 5 07:03 (34)<br>19:44      | 06:01<br>20:17 |
| 2                        | 08:28<br>17:58 | 08:10<br>18:20           | 9 08:31 (27)<br>08:40 (28)  | 07:31<br>18:47 | 06:43<br>19:14 | 6 07:01 (34)<br>07:07 (34) | 06:00<br>19:45 |
| 3                        | 08:27<br>17:58 | 08:09<br>18:21           | 9 08:30 (27)<br>08:39 (28)  | 07:29<br>18:48 | 06:42<br>19:15 | 6 06:59 (34)<br>07:05 (34) | 05:59<br>19:47 |
| 4                        | 08:27<br>17:59 | 08:08<br>18:22           | 10 08:28 (27)<br>08:38 (27) | 07:28<br>18:49 | 06:40<br>19:16 | 6 06:58 (34)<br>07:04 (34) | 05:58<br>19:48 |
| 5                        | 08:27<br>17:59 | 08:07<br>18:23           | 11 08:27 (27)<br>08:38 (27) | 07:26<br>18:50 | 06:39<br>19:17 | 3 06:58 (34)<br>07:01 (34) | 05:57<br>19:49 |
| 6                        | 08:27<br>18:00 | 08:06<br>18:23           | 12 08:26 (27)<br>08:38 (27) | 07:25<br>18:51 | 06:37<br>19:18 |                            | 05:55<br>19:50 |
| 7                        | 08:27<br>18:01 | 08:05<br>18:24           | 14 08:25 (27)<br>08:39 (27) | 07:23<br>18:51 | 06:36<br>19:19 |                            | 05:54<br>19:51 |
| 8                        | 08:26<br>18:01 | 08:04<br>18:25           | 15 08:24 (27)<br>08:39 (27) | 07:21<br>18:52 | 06:34<br>19:20 |                            | 05:53<br>19:52 |
| 9                        | 08:26<br>18:02 | 08:03<br>18:26           | 16 08:23 (27)<br>08:39 (27) | 07:20<br>18:53 | 06:33<br>19:20 |                            | 05:52<br>19:53 |
| 10                       | 08:26<br>18:02 | 08:02<br>18:27           | 16 08:22 (27)<br>08:38 (27) | 07:18<br>18:54 | 06:31<br>19:21 |                            | 05:51<br>19:54 |
| 11                       | 08:26<br>18:03 | 08:01<br>18:28           | 17 08:20 (27)<br>08:37 (27) | 07:17<br>18:55 | 06:30<br>19:22 |                            | 05:51<br>19:56 |
| 12                       | 08:25<br>18:04 | 07:59<br>18:29           | 16 08:20 (27)<br>08:36 (27) | 07:15<br>18:56 | 06:28<br>19:23 |                            | 05:50<br>19:57 |
| 13                       | 08:25<br>18:04 | 07:58<br>18:30           | 14 08:21 (27)<br>08:35 (27) | 07:14<br>18:57 | 06:27<br>19:24 |                            | 05:49<br>19:58 |
| 14                       | 08:24<br>18:05 | 07:57<br>18:30           | 11 08:23 (27)<br>08:34 (27) | 07:12<br>18:58 | 06:25<br>19:25 |                            | 05:48<br>19:59 |
| 15                       | 08:24<br>18:06 | 08:45 (29)<br>08:46 (29) | 07:56<br>18:31              | 07:10<br>18:58 | 06:24<br>19:26 |                            | 05:47<br>20:00 |
| 16                       | 08:23<br>18:06 | 08:44 (29)<br>08:46 (29) | 07:55<br>18:32              | 07:09<br>18:59 | 06:22<br>19:27 |                            | 05:46<br>20:01 |
| 17                       | 08:23<br>18:07 | 08:44 (29)<br>08:47 (29) | 07:53<br>18:33              | 07:07<br>19:00 | 06:21<br>19:28 |                            | 05:45<br>20:02 |
| 18                       | 08:22<br>18:08 | 08:43 (29)<br>08:47 (29) | 07:52<br>18:34              | 07:06<br>19:01 | 06:19<br>19:29 |                            | 05:45<br>20:03 |
| 19                       | 08:22<br>18:09 | 08:42 (29)<br>08:46 (29) | 07:51<br>18:35              | 07:04<br>19:02 | 06:18<br>19:30 |                            | 05:44<br>20:05 |
| 20                       | 08:21<br>18:09 | 08:42 (29)<br>08:47 (29) | 07:49<br>18:36              | 07:02<br>19:03 | 06:16<br>19:31 |                            | 05:43<br>20:06 |
| 21                       | 08:20<br>18:10 | 08:41 (29)<br>08:47 (29) | 07:48<br>18:37              | 07:01<br>19:04 | 06:15<br>19:33 |                            | 05:43<br>20:07 |
| 22                       | 08:20<br>18:11 | 08:40 (29)<br>08:46 (29) | 07:47<br>18:37              | 06:59<br>19:05 | 06:14<br>19:34 |                            | 05:42<br>20:08 |
| 23                       | 08:19<br>18:12 | 08:40 (29)<br>08:46 (29) | 07:45<br>18:38              | 06:58<br>19:06 | 06:12<br>19:35 |                            | 05:42<br>20:09 |
| 24                       | 08:18<br>18:13 | 08:39 (29)<br>08:45 (29) | 07:44<br>18:39              | 06:56<br>19:06 | 06:11<br>19:36 |                            | 05:41<br>20:10 |
| 25                       | 08:17<br>18:13 | 08:38 (29)<br>08:44 (29) | 07:42<br>18:40              | 06:54<br>19:07 | 06:10<br>19:37 |                            | 05:41<br>20:11 |
| 26                       | 08:17<br>18:14 | 07:41<br>18:41           |                             | 06:53<br>19:08 | 06:08<br>19:38 |                            | 05:40<br>20:12 |
| 27                       | 08:16<br>18:15 | 08:36 (28)<br>08:37 (28) | 07:39<br>18:42              | 06:51<br>19:09 | 06:07<br>19:39 |                            | 05:40<br>20:13 |
| 28                       | 08:15<br>18:16 | 08:35 (28)<br>08:37 (28) | 07:38<br>18:43              | 06:50<br>19:10 | 06:06<br>19:40 |                            | 05:39<br>20:14 |
| 29                       | 08:14<br>18:17 | 08:35 (28)<br>08:39 (28) | 07:37<br>18:44              | 06:48<br>19:11 | 06:05<br>19:41 | 07:06 (34)<br>07:08 (34)   | 05:39<br>20:15 |
| 30                       | 08:13<br>18:17 | 08:34 (28)<br>08:39 (28) | 07:35<br>18:44              | 06:47<br>19:12 | 06:03<br>19:42 | 07:04 (34)<br>07:08 (34)   | 05:39<br>20:16 |
| 31                       | 08:12<br>18:18 | 08:33 (27)<br>08:39 (28) | 07:34<br>18:45              |                | 06:02<br>19:43 |                            | 05:46<br>20:37 |
| Horas de sol potenciales | 302            | 330                      | 355                         | 406            | 426            | 459                        |                |
| Total, caso peor         | 67             | 183                      | 6                           | 26             |                |                            |                |

#### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

|             |                        |                        |                                  |   |   |                                       |                                      |
|-------------|------------------------|------------------------|----------------------------------|---|---|---------------------------------------|--------------------------------------|
| Día del mes | Salida del sol (hh:mm) | Puesta de sol (hh: mm) | Minutos con sombras de centelleo | Hora inicial (hh:mm), sombras con centelleo | Hora Final (hh:mm), sombras con centelleo | (Primeras sombras de centelleo de AG) | (Últimas sombras de centelleo de AG) |
|-------------|------------------------|------------------------|----------------------------------|---|---|---------------------------------------|--------------------------------------|

## SHADOW - Calendario

### Cálculo: Restricciones nuevas 14.07 Receptor de sombra: Punto 7 - Punto 7 Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                          | Enero | Febrero | Marzo | Abril | Mayo          | Junio | Julio | Agosto | Septiembre   | Octubre       | Noviembre     | Diciembre |       |
|--------------------------|-------|---------|-------|-------|---------------|-------|-------|--------|--------------|---------------|---------------|-----------|-------|
| 1                        | 05:47 | 06:20   | 06:52 | 07:22 | 07:51         | 08:17 | 08:28 | 08:11  | 07:32        | 07:51 (34)    | 06:45         | 06:01     | 05:38 |
|                          | 20:37 | 20:24   | 19:50 | 19:03 | 18:21         | 17:56 | 17:57 | 18:19  | 18:46        | 7 07:58 (34)  | 19:13         | 19:44     | 20:17 |
| 2                        | 05:48 | 06:21   | 06:53 | 07:23 | 07:52         | 08:18 | 08:28 | 08:10  | 07:31        | 07:49 (34)    | 06:43         | 06:00     | 05:38 |
|                          | 20:37 | 20:23   | 19:49 | 19:01 | 18:20         | 17:55 | 17:58 | 18:20  | 18:47        | 9 07:58 (34)  | 19:14         | 19:45     | 20:18 |
| 3                        | 05:49 | 06:22   | 06:54 | 07:24 | 07:53         | 08:18 | 08:27 | 08:09  | 07:29        | 07:48 (34)    | 06:42         | 05:59     | 05:38 |
|                          | 20:37 | 20:22   | 19:47 | 19:00 | 18:18         | 17:55 | 17:58 | 18:21  | 18:48        | 10 07:58 (34) | 19:15         | 19:47     | 20:19 |
| 4                        | 05:50 | 06:23   | 06:55 | 07:25 | 7 07:48 (34)  | 07:53 | 08:19 | 08:27  | 08:08        | 07:28         | 07:46 (34)    | 06:40     | 05:58 |
|                          | 20:37 | 20:21   | 19:46 | 18:58 | 9 07:57 (34)  | 18:17 | 17:55 | 17:59  | 18:22        | 18:49         | 11 07:57 (34) | 19:16     | 19:48 |
| 5                        | 05:51 | 06:25   | 06:56 | 07:26 | 7 07:46 (34)  | 07:54 | 08:20 | 08:27  | 08:07        | 07:26         | 07:44 (34)    | 06:39     | 05:57 |
|                          | 20:37 | 20:20   | 19:44 | 18:56 | 13 07:59 (34) | 18:16 | 17:54 | 17:59  | 18:23        | 18:50         | 12 07:56 (34) | 19:17     | 19:49 |
| 6                        | 05:52 | 06:26   | 06:57 | 07:27 | 7 07:47 (34)  | 07:55 | 08:20 | 08:27  | 08:06        | 07:25         | 07:43 (34)    | 06:37     | 05:55 |
|                          | 20:37 | 20:19   | 19:43 | 18:55 | 12 07:59 (34) | 18:15 | 17:54 | 18:00  | 18:23        | 18:51         | 12 07:55 (34) | 19:18     | 19:50 |
| 7                        | 05:52 | 06:27   | 06:58 | 07:28 | 7 07:48 (34)  | 07:56 | 08:21 | 08:27  | 08:05        | 07:23         | 07:41 (34)    | 06:36     | 05:54 |
|                          | 20:37 | 20:18   | 19:41 | 18:53 | 12 08:00 (34) | 18:14 | 17:54 | 18:00  | 18:24        | 18:51         | 13 07:54 (34) | 19:19     | 19:51 |
| 8                        | 05:53 | 06:28   | 06:59 | 07:29 | 7 07:49 (34)  | 07:57 | 08:21 | 08:26  | 08:04        | 07:21         | 07:43 (34)    | 06:34     | 05:53 |
|                          | 20:37 | 20:17   | 19:40 | 18:52 | 11 08:00 (34) | 18:13 | 17:54 | 18:01  | 18:25        | 18:52         | 9 07:52 (34)  | 19:19     | 19:52 |
| 9                        | 05:54 | 06:29   | 07:00 | 07:30 | 7 07:50 (34)  | 07:58 | 08:22 | 08:26  | 08:03        | 07:20         | 06:33         | 05:52     | 05:37 |
|                          | 20:37 | 20:16   | 19:38 | 18:50 | 10 08:00 (34) | 18:12 | 17:54 | 18:02  | 18:26        | 18:53         | 19:20         | 19:53     | 20:25 |
| 10                       | 05:55 | 06:30   | 07:01 | 07:31 | 7 07:51 (34)  | 07:59 | 08:22 | 08:26  | 08:02        | 07:18         | 06:31         | 05:51     | 05:37 |
|                          | 20:37 | 20:15   | 19:37 | 18:49 | 9 08:00 (34)  | 18:11 | 17:53 | 18:02  | 18:27        | 18:54         | 19:21         | 19:54     | 20:26 |
| 11                       | 05:56 | 06:32   | 07:02 | 07:32 | 7 07:52 (34)  | 08:00 | 08:23 | 08:25  | 08:01        | 07:17         | 06:30         | 05:50     | 05:37 |
|                          | 20:36 | 20:14   | 19:35 | 18:47 | 7 07:59 (34)  | 18:10 | 17:53 | 18:03  | 18:28        | 18:55         | 19:22         | 19:56     | 20:26 |
| 12                       | 05:57 | 06:33   | 07:03 | 07:33 | 7 07:53 (34)  | 08:01 | 08:23 | 08:25  | 07:59        | 07:15         | 06:28         | 05:50     | 05:37 |
|                          | 20:36 | 20:13   | 19:34 | 18:46 | 5 07:58 (34)  | 18:09 | 17:53 | 18:04  | 18:29        | 18:56         | 19:23         | 19:57     | 20:27 |
| 13                       | 05:58 | 06:34   | 07:04 | 07:34 | 7 07:54 (34)  | 08:02 | 08:24 | 08:25  | 07:58        | 07:14         | 06:27         | 05:49     | 05:38 |
|                          | 20:36 | 20:11   | 19:32 | 18:45 | 3 07:57 (34)  | 18:08 | 17:53 | 18:04  | 18:30        | 18:57         | 19:24         | 19:58     | 20:28 |
| 14                       | 05:59 | 06:35   | 07:05 | 07:35 | 08:03         | 08:24 | 08:24 | 07:57  | 07:12        | 07:12         | 06:25         | 05:48     | 05:38 |
|                          | 20:35 | 20:10   | 19:31 | 18:43 | 18:07         | 17:53 | 18:05 | 18:30  | 18:58        | 19:25         | 19:25         | 19:59     | 20:29 |
| 15                       | 06:01 | 06:36   | 07:06 | 07:36 | 08:03         | 08:25 | 08:24 | 07:56  | 07:10        | 07:10         | 06:24         | 05:47     | 05:38 |
|                          | 20:35 | 20:09   | 19:29 | 18:42 | 18:06         | 17:53 | 18:06 | 18:31  | 18:58        | 19:26         | 19:26         | 20:00     | 20:29 |
| 16                       | 06:02 | 06:37   | 07:07 | 07:37 | 08:04         | 08:25 | 08:23 | 07:54  | 07:09        | 07:09         | 06:22         | 05:46     | 05:38 |
|                          | 20:35 | 20:08   | 19:27 | 18:40 | 18:05         | 17:53 | 18:06 | 18:32  | 1 08:15 (35) | 18:59         | 19:27         | 20:01     | 20:30 |
| 17                       | 06:03 | 06:39   | 07:08 | 07:38 | 08:05         | 08:25 | 08:23 | 07:53  | 07:07        | 07:07         | 06:21         | 05:45     | 05:39 |
|                          | 20:34 | 20:06   | 19:26 | 18:39 | 18:05         | 17:53 | 18:07 | 18:33  | 2 08:15 (35) | 19:00         | 19:28         | 20:02     | 20:31 |
| 18                       | 06:04 | 06:40   | 07:09 | 07:38 | 08:06         | 08:26 | 08:22 | 07:52  | 07:06        | 07:06         | 06:19         | 05:45     | 05:39 |
|                          | 20:34 | 20:05   | 19:24 | 18:37 | 18:04         | 17:54 | 18:08 | 18:34  | 4 08:15 (35) | 19:01         | 19:29         | 20:03     | 20:31 |
| 19                       | 06:05 | 06:41   | 07:10 | 07:39 | 7 07:59 (35)  | 08:07 | 08:22 | 07:51  | 07:04        | 07:04         | 06:18         | 05:44     | 05:39 |
|                          | 20:33 | 20:04   | 19:23 | 18:36 | 7 08:06 (35)  | 18:03 | 17:54 | 18:09  | 18:35        | 5 08:15 (35)  | 19:30         | 20:04     | 20:32 |
| 20                       | 06:06 | 06:42   | 07:11 | 07:40 | 8 08:00 (35)  | 08:08 | 08:26 | 08:21  | 07:49        | 07:49         | 06:16         | 05:43     | 05:40 |
|                          | 20:33 | 20:03   | 19:21 | 18:35 | 8 08:08 (35)  | 18:02 | 17:54 | 18:09  | 18:36        | 6 08:14 (35)  | 19:31         | 20:06     | 20:32 |
| 21                       | 06:07 | 06:43   | 07:12 | 07:41 | 8 08:01 (35)  | 08:09 | 08:27 | 08:20  | 07:48        | 07:48         | 06:15         | 05:43     | 05:40 |
|                          | 20:32 | 20:01   | 19:20 | 18:33 | 8 08:09 (35)  | 18:02 | 17:54 | 18:10  | 18:37        | 7 08:14 (35)  | 19:33         | 20:07     | 20:33 |
| 22                       | 06:08 | 06:44   | 07:13 | 07:42 | 7 08:02 (35)  | 08:09 | 08:27 | 08:20  | 07:47        | 07:47         | 06:14         | 05:42     | 05:41 |
|                          | 20:32 | 20:00   | 19:18 | 18:32 | 7 08:09 (35)  | 18:01 | 17:54 | 18:11  | 18:37        | 8 08:14 (35)  | 19:34         | 20:08     | 20:33 |
| 23                       | 06:09 | 06:45   | 07:14 | 07:43 | 6 08:03 (35)  | 08:10 | 08:27 | 08:19  | 07:45        | 07:45         | 06:12         | 05:42     | 05:41 |
|                          | 20:31 | 19:59   | 19:17 | 18:31 | 6 08:09 (35)  | 18:00 | 17:54 | 18:12  | 18:38        | 8 08:12 (35)  | 19:35         | 20:09     | 20:34 |
| 24                       | 06:11 | 06:46   | 07:15 | 07:44 | 5 08:04 (35)  | 08:11 | 08:27 | 08:18  | 07:44        | 07:44         | 06:11         | 05:41     | 05:42 |
|                          | 20:30 | 19:57   | 19:15 | 18:29 | 5 08:09 (35)  | 18:00 | 17:55 | 18:12  | 18:39        | 6 08:04 (35)  | 19:36         | 20:10     | 20:34 |
| 25                       | 06:12 | 06:47   | 07:16 | 07:45 | 4 08:05 (35)  | 08:12 | 08:27 | 08:17  | 07:42        | 07:42         | 06:10         | 05:40     | 05:42 |
|                          | 20:30 | 19:56   | 19:13 | 18:28 | 4 08:09 (35)  | 17:59 | 17:55 | 18:13  | 18:40        | 06:54         | 19:37         | 20:11     | 20:35 |
| 26                       | 06:13 | 06:48   | 07:17 | 07:46 | 2 08:06 (35)  | 08:13 | 08:27 | 08:17  | 07:41        | 07:41         | 06:53         | 05:40     | 05:43 |
|                          | 20:29 | 19:54   | 19:12 | 18:27 | 2 08:08 (35)  | 17:58 | 17:55 | 18:14  | 18:41        | 19:08         | 19:38         | 20:12     | 20:35 |
| 27                       | 06:14 | 06:50   | 07:18 | 07:47 | 08:13         | 08:28 | 08:16 | 07:39  | 07:39        | 07:39         | 06:51         | 05:40     | 05:43 |
|                          | 20:28 | 19:53   | 19:10 | 18:26 | 17:58         | 17:56 | 18:15 | 18:42  | 19:09        | 19:09         | 19:39         | 20:13     | 20:36 |
| 28                       | 06:15 | 06:51   | 07:19 | 07:48 | 08:14         | 08:28 | 08:15 | 07:38  | 07:38        | 07:38         | 06:50         | 05:39     | 05:44 |
|                          | 20:27 | 19:52   | 19:09 | 18:24 | 17:57         | 17:56 | 18:16 | 18:43  | 19:10        | 19:10         | 19:40         | 20:14     | 20:36 |
| 29                       | 06:16 | 06:52   | 07:20 | 07:49 | 08:15         | 08:28 | 08:14 | 07:37  | 07:37        | 07:37         | 06:48         | 05:39     | 05:45 |
|                          | 20:27 | 19:07   | 18:23 | 17:57 | 17:57         | 17:56 | 18:17 | 18:44  | 19:11        | 19:11         | 19:41         | 20:15     | 20:36 |
| 30                       | 06:18 | 06:54   | 07:21 | 07:50 | 08:16         | 08:28 | 08:13 | 07:35  | 07:35        | 07:35         | 06:47         | 05:39     | 05:45 |
|                          | 20:26 | 19:06   | 18:22 | 17:56 | 17:56         | 17:57 | 18:17 | 18:44  | 3 07:54 (34) | 19:12         | 19:42         | 20:16     | 20:36 |
| 31                       | 06:19 | 06:55   | 07:21 | 07:50 | 08:16         | 08:28 | 08:12 | 07:34  | 07:34        | 07:34         | 06:47         | 05:39     | 05:45 |
|                          | 20:25 | 19:04   | 18:20 | 17:56 | 17:56         | 17:57 | 18:18 | 18:45  | 5 07:57 (34) | 19:12         | 19:43         | 20:17     | 20:37 |
| Horas de sol potenciales | 450   | 380     | 383   | 333   | 311           | 285   | 302   | 330    | 355          | 83            | 406           | 426       | 459   |
| Total, caso peor         |       |         |       | 138   |               |       |       |        | 55           |               |               |           |       |

### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

Día del mes      Salida del sol (hh:mm)      Puesta de sol (hh:mm)      Minutos con sombras de centelleo      Hora inicial (hh:mm), sombras con centelleo      Hora Final (hh:mm), sombras con centelleo      (Primeras sombras de centelleo de AG)      (Últimas sombras de centelleo de AG)

## SHADOW - Calendario

### Cálculo: Restricciones nuevas 14.07 Receptor de sombra: Punto 8 - Punto 8 Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                          | Enero | Febrero | Marzo | Abril | Mayo  | Junio         | Julio | Agosto | Septiembre   | Octubre       | Noviembre | Diciembre |       |       |
|--------------------------|-------|---------|-------|-------|-------|---------------|-------|--------|--------------|---------------|-----------|-----------|-------|-------|
| 1                        | 05:47 | 06:20   | 06:52 | 07:22 | 07:51 | 08:17 (34)    | 08:17 | 08:28  | 08:11        | 08:32 (34)    | 07:32     | 06:45     | 06:01 | 05:38 |
|                          | 20:37 | 20:24   | 19:50 | 19:03 | 18:21 | 6 08:23 (34)  | 17:56 | 17:57  | 18:19        | 6 08:38 (34)  | 18:46     | 19:13     | 19:44 | 20:17 |
| 2                        | 05:48 | 06:21   | 06:53 | 07:23 | 07:52 | 08:15 (34)    | 08:18 | 08:28  | 08:10        | 08:31 (34)    | 07:31     | 06:43     | 06:00 | 05:38 |
|                          | 20:37 | 20:23   | 19:49 | 19:01 | 18:20 | 10 08:25 (34) | 17:55 | 17:58  | 18:20        | 8 08:39 (34)  | 18:47     | 19:14     | 19:45 | 20:18 |
| 3                        | 05:49 | 06:22   | 06:54 | 07:24 | 07:53 | 08:13 (34)    | 08:18 | 08:27  | 08:09        | 08:30 (34)    | 07:29     | 06:42     | 05:59 | 05:38 |
|                          | 20:37 | 20:22   | 19:47 | 18:59 | 18:18 | 13 08:26 (34) | 17:55 | 17:58  | 18:21        | 9 08:39 (34)  | 18:48     | 19:15     | 19:47 | 20:19 |
| 4                        | 05:50 | 06:23   | 06:55 | 07:25 | 07:53 | 08:14 (34)    | 08:20 | 08:27  | 08:08        | 08:28 (34)    | 07:28     | 06:40     | 05:58 | 05:38 |
|                          | 20:37 | 20:21   | 19:46 | 18:58 | 18:17 | 13 08:27 (34) | 17:55 | 17:59  | 18:22        | 10 08:38 (34) | 18:49     | 19:16     | 19:48 | 20:20 |
| 5                        | 05:51 | 06:25   | 06:56 | 07:26 | 07:54 | 08:15 (34)    | 08:20 | 08:27  | 08:07        | 08:27 (34)    | 07:26     | 06:39     | 05:56 | 05:37 |
|                          | 20:37 | 20:20   | 19:44 | 18:56 | 18:16 | 13 08:28 (34) | 17:54 | 17:59  | 18:23        | 11 08:38 (34) | 18:50     | 19:17     | 19:49 | 20:21 |
| 6                        | 05:52 | 06:26   | 06:57 | 07:27 | 07:55 | 08:16 (34)    | 08:20 | 08:27  | 08:06        | 08:26 (34)    | 07:25     | 06:37     | 05:55 | 05:37 |
|                          | 20:37 | 20:19   | 19:43 | 18:55 | 18:15 | 12 08:28 (34) | 17:54 | 18:00  | 18:23        | 12 08:38 (34) | 18:51     | 19:18     | 19:50 | 20:22 |
| 7                        | 05:52 | 06:27   | 06:58 | 07:28 | 07:56 | 08:17 (34)    | 08:21 | 08:27  | 08:05        | 08:25 (34)    | 07:23     | 06:36     | 05:54 | 05:37 |
|                          | 20:37 | 20:18   | 19:41 | 18:53 | 18:14 | 11 08:28 (34) | 17:54 | 18:00  | 18:24        | 12 08:37 (34) | 18:51     | 19:19     | 19:51 | 20:23 |
| 8                        | 05:53 | 06:28   | 06:59 | 07:29 | 07:57 | 08:18 (34)    | 08:21 | 08:27  | 08:04        | 08:24 (34)    | 07:21     | 06:34     | 05:53 | 05:37 |
|                          | 20:37 | 20:17   | 19:40 | 18:52 | 18:13 | 11 08:29 (34) | 17:54 | 18:01  | 18:25        | 13 08:37 (34) | 18:52     | 19:19     | 19:52 | 20:24 |
| 9                        | 05:54 | 06:29   | 07:00 | 07:30 | 07:58 | 08:19 (34)    | 08:22 | 08:27  | 08:03        | 08:23 (34)    | 07:20     | 06:33     | 05:52 | 05:37 |
|                          | 20:37 | 20:16   | 19:38 | 18:50 | 18:12 | 10 08:29 (34) | 17:54 | 18:02  | 18:26        | 13 08:36 (34) | 18:53     | 19:20     | 19:53 | 20:25 |
| 10                       | 05:55 | 06:30   | 07:01 | 07:31 | 07:59 | 08:20 (34)    | 08:22 | 08:26  | 08:02        | 08:23 (34)    | 07:18     | 06:31     | 05:51 | 05:37 |
|                          | 20:37 | 20:15   | 19:37 | 18:49 | 18:11 | 8 08:28 (34)  | 17:53 | 18:02  | 18:27        | 12 08:35 (34) | 18:54     | 19:21     | 19:54 | 20:26 |
| 11                       | 05:56 | 06:32   | 07:02 | 07:32 | 08:00 | 08:21 (34)    | 08:23 | 08:25  | 08:01        | 08:24 (34)    | 07:17     | 06:30     | 05:50 | 05:37 |
|                          | 20:36 | 20:14   | 19:35 | 18:47 | 18:10 | 7 08:28 (34)  | 17:53 | 18:03  | 18:28        | 9 08:33 (34)  | 18:55     | 19:22     | 19:56 | 20:26 |
| 12                       | 05:57 | 06:33   | 07:03 | 07:33 | 08:01 | 08:22 (34)    | 08:23 | 08:25  | 07:59        | 08:27 (34)    | 07:15     | 06:28     | 05:50 | 05:37 |
|                          | 20:36 | 20:13   | 19:34 | 18:46 | 18:09 | 6 08:28 (34)  | 17:53 | 18:04  | 18:29        | 2 08:29 (34)  | 18:56     | 19:23     | 19:57 | 20:27 |
| 13                       | 05:58 | 06:34   | 07:04 | 07:34 | 08:02 | 08:23 (34)    | 08:24 | 08:25  | 07:58        | 07:14         | 06:27     | 05:49     | 05:38 |       |
|                          | 20:36 | 20:11   | 19:32 | 18:45 | 18:08 | 4 08:27 (34)  | 17:53 | 18:04  | 18:30        | 07:12         | 06:25     | 05:48     | 05:38 |       |
| 14                       | 05:59 | 06:35   | 07:05 | 07:35 | 08:03 | 08:23 (34)    | 08:24 | 08:24  | 07:57        | 07:12         | 06:25     | 05:48     | 05:38 |       |
|                          | 20:35 | 20:10   | 19:31 | 18:43 | 18:07 | 7 08:30 (35)  | 17:53 | 18:05  | 18:30        | 07:12         | 06:25     | 05:48     | 05:38 |       |
| 15                       | 06:00 | 06:36   | 07:06 | 07:36 | 08:03 | 08:24 (35)    | 08:25 | 08:24  | 07:56        | 07:10         | 06:24     | 05:47     | 05:38 |       |
|                          | 20:35 | 20:09   | 19:29 | 18:42 | 18:06 | 8 08:32 (35)  | 17:53 | 18:06  | 18:31        | 07:10         | 06:24     | 05:47     | 05:38 |       |
| 16                       | 06:02 | 06:37   | 07:07 | 07:37 | 08:04 | 08:25 (35)    | 08:25 | 08:23  | 07:54        | 07:09         | 06:22     | 05:46     | 05:38 |       |
|                          | 20:35 | 20:08   | 19:27 | 18:40 | 18:05 | 8 08:33 (35)  | 17:53 | 18:06  | 18:32        | 07:09         | 06:22     | 05:46     | 05:38 |       |
| 17                       | 06:03 | 06:38   | 07:08 | 07:38 | 08:05 | 08:26 (35)    | 08:25 | 08:23  | 07:53        | 07:07         | 06:21     | 05:45     | 05:39 |       |
|                          | 20:34 | 20:06   | 19:26 | 18:39 | 18:05 | 8 08:34 (35)  | 17:53 | 18:07  | 18:33        | 07:07         | 06:21     | 05:45     | 05:39 |       |
| 18                       | 06:04 | 06:40   | 07:09 | 07:38 | 08:06 | 08:27 (35)    | 08:26 | 08:22  | 07:52        | 07:06         | 06:19     | 05:45     | 05:39 |       |
|                          | 20:34 | 20:05   | 19:24 | 18:37 | 18:04 | 7 08:34 (35)  | 17:53 | 18:08  | 1 08:44 (35) | 18:34         | 07:04     | 06:18     | 05:44 | 05:39 |
| 19                       | 06:05 | 06:41   | 07:10 | 07:39 | 08:07 | 08:28 (35)    | 08:26 | 08:22  | 07:51        | 07:04         | 06:18     | 05:44     | 05:39 |       |
|                          | 20:33 | 20:04   | 19:23 | 18:36 | 18:03 | 7 08:35 (35)  | 17:54 | 18:09  | 2 08:44 (35) | 18:35         | 07:02     | 06:16     | 05:43 | 05:40 |
| 20                       | 06:06 | 06:42   | 07:11 | 07:40 | 08:08 | 08:29 (35)    | 08:26 | 08:21  | 07:49        | 07:02         | 06:16     | 05:43     | 05:40 |       |
|                          | 20:33 | 20:03   | 19:21 | 18:35 | 18:02 | 6 08:35 (35)  | 17:54 | 18:09  | 3 08:45 (35) | 18:36         | 07:03     | 06:15     | 05:43 | 05:40 |
| 21                       | 06:07 | 06:43   | 07:12 | 07:41 | 08:09 | 08:30 (35)    | 08:27 | 08:20  | 07:48        | 07:01         | 06:15     | 05:43     | 05:40 |       |
|                          | 20:32 | 20:01   | 19:20 | 18:33 | 18:02 | 6 08:36 (35)  | 17:54 | 18:10  | 4 08:45 (35) | 18:37         | 07:01     | 06:15     | 05:43 | 05:40 |
| 22                       | 06:08 | 06:44   | 07:13 | 07:42 | 08:09 | 08:31 (35)    | 08:27 | 08:20  | 07:47        | 07:01         | 06:15     | 05:43     | 05:40 |       |
|                          | 20:32 | 20:00   | 19:18 | 18:32 | 18:01 | 5 08:36 (35)  | 17:54 | 18:11  | 5 08:45 (35) | 18:37         | 07:01     | 06:15     | 05:43 | 05:40 |
| 23                       | 06:09 | 06:45   | 07:14 | 07:43 | 08:10 | 08:32 (35)    | 08:27 | 08:19  | 07:45        | 07:01         | 06:15     | 05:43     | 05:40 |       |
|                          | 20:31 | 19:59   | 19:17 | 18:31 | 18:00 | 4 08:36 (35)  | 17:54 | 18:12  | 6 08:46 (35) | 18:38         | 07:01     | 06:15     | 05:43 | 05:40 |
| 24                       | 06:11 | 06:46   | 07:15 | 07:44 | 08:11 | 08:32 (35)    | 08:27 | 08:18  | 07:44        | 07:01         | 06:15     | 05:43     | 05:40 |       |
|                          | 20:30 | 19:57   | 19:15 | 18:29 | 18:00 | 3 08:35 (35)  | 17:55 | 18:12  | 7 08:46 (35) | 18:39         | 07:01     | 06:15     | 05:43 | 05:40 |
| 25                       | 06:12 | 06:47   | 07:16 | 07:45 | 08:12 | 08:33 (35)    | 08:27 | 08:17  | 07:42        | 07:01         | 06:15     | 05:43     | 05:40 |       |
|                          | 20:30 | 19:56   | 19:13 | 18:28 | 17:59 | 2 08:35 (35)  | 17:55 | 18:13  | 7 08:45 (35) | 18:40         | 07:01     | 06:15     | 05:43 | 05:40 |
| 26                       | 06:13 | 06:48   | 07:17 | 07:46 | 08:13 | 08:34 (35)    | 08:27 | 08:17  | 07:41        | 07:01         | 06:15     | 05:43     | 05:40 |       |
|                          | 20:29 | 19:54   | 19:12 | 18:27 | 17:58 | 1 08:35 (35)  | 17:55 | 18:14  | 8 08:45 (35) | 18:41         | 07:01     | 06:15     | 05:43 | 05:40 |
| 27                       | 06:14 | 06:50   | 07:18 | 07:47 | 08:13 | 08:35 (35)    | 08:27 | 08:16  | 07:39        | 07:01         | 06:15     | 05:43     | 05:40 |       |
|                          | 20:28 | 19:53   | 19:10 | 18:26 | 17:58 | 08:36 (35)    | 08:27 | 18:15  | 8 08:44 (35) | 18:42         | 07:01     | 06:15     | 05:43 | 05:40 |
| 28                       | 06:15 | 06:51   | 07:19 | 07:48 | 08:14 | 08:36 (35)    | 08:27 | 08:15  | 07:38        | 07:01         | 06:15     | 05:43     | 05:40 |       |
|                          | 20:27 | 19:52   | 19:09 | 18:24 | 17:57 | 08:37 (35)    | 08:27 | 18:16  | 8 08:43 (35) | 18:43         | 07:01     | 06:15     | 05:43 | 05:40 |
| 29                       | 06:16 | 06:52   | 07:20 | 07:49 | 08:15 | 08:38 (35)    | 08:27 | 08:14  | 07:37        | 07:01         | 06:15     | 05:43     | 05:40 |       |
|                          | 20:27 | 19:52   | 19:09 | 18:24 | 17:57 | 08:39 (35)    | 08:27 | 18:17  | 8 08:43 (35) | 18:44         | 07:01     | 06:15     | 05:43 | 05:40 |
| 30                       | 06:18 | 06:54   | 07:22 | 07:50 | 08:16 | 08:39 (35)    | 08:27 | 08:13  | 07:35        | 07:01         | 06:15     | 05:43     | 05:40 |       |
|                          | 20:26 | 19:51   | 19:06 | 18:22 | 17:56 | 08:40 (35)    | 08:27 | 18:17  | 3 08:37 (34) | 18:44         | 07:01     | 06:15     | 05:43 | 05:40 |
| 31                       | 06:19 | 06:55   | 07:23 | 07:51 | 08:17 | 08:41 (35)    | 08:27 | 08:12  | 07:34        | 07:01         | 06:15     | 05:43     | 05:40 |       |
|                          | 20:25 | 19:50   | 19:04 | 18:19 | 17:56 | 5 08:38 (34)  | 18:45 | 18:18  | 4 08:38 (34) | 18:45         | 07:01     | 06:15     | 05:43 | 05:40 |
| Horas de sol potenciales | 450   | 380     | 383   | 333   | 311   | 285           | 302   | 330    | 330          | 355           | 406       | 426       | 459   |       |
| Total, caso peor         |       |         |       |       | 196   |               | 75    | 117    |              |               |           |           |       |       |

### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

|             |                        |                       |                                  |   |   |                                       |                                      |
|-------------|------------------------|-----------------------|----------------------------------|---|---|---------------------------------------|--------------------------------------|
| Día del mes | Salida del sol (hh:mm) | Puesta de sol (hh:mm) | Minutos con sombras de centelleo | Hora inicial (hh:mm), sombras con centelleo | Hora Final (hh:mm), sombras con centelleo | (Primeras sombras de centelleo de AG) | (Últimas sombras de centelleo de AG) |
|-------------|------------------------|-----------------------|----------------------------------|---|---|---------------------------------------|--------------------------------------|



## SHADOW - Calendario

**Cálculo:** Restricciones nuevas 14.07 **Receptor de sombra:** Punto 9 - Punto 9  
**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                          | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|--------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                        | 05:47<br>20:36 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:02 | 07:50<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                        | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:48 | 07:23<br>19:01 | 07:51<br>18:19 | 08:17<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:30<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                        | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                        | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:58<br>19:47 | 05:38<br>20:20 |
| 5                        | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:16 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                        | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                        | 05:53<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:26<br>18:01 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                        | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                        | 05:54<br>20:36 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:24 |
| 10                       | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                       | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:00<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                       | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:56 | 05:37<br>20:27 |
| 13                       | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:45 | 08:01<br>18:08 | 08:24<br>17:53 | 08:24<br>18:04 | 07:58<br>18:30 | 07:13<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                       | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:30 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:57 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                       | 06:01<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:35<br>18:42 | 08:03<br>18:06 | 08:24<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                       | 06:02<br>20:34 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                       | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:22<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:30 |
| 18                       | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:54 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                       | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                       | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 | 08:07<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                       | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:26<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:06 | 05:40<br>20:33 |
| 22                       | 06:08<br>20:31 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:19<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                       | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:55 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 | 05:42<br>20:09 | 05:41<br>20:34 |
| 24                       | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:35 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                       | 06:12<br>20:29 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:41<br>20:11 | 05:42<br>20:35 |
| 26                       | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:16<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                       | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:26 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                       | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                       | 06:16<br>20:26 |                | 07:19<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:27<br>17:57 | 08:14<br>18:17 | 07:36<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                       | 06:18<br>20:26 |                | 07:20<br>19:06 | 07:49<br>18:22 | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:39<br>20:16 | 05:46<br>20:36 |
| 31                       | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:33<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Total, caso peor         |                |                |                |                |                |                |                |                |                |                |                |                |

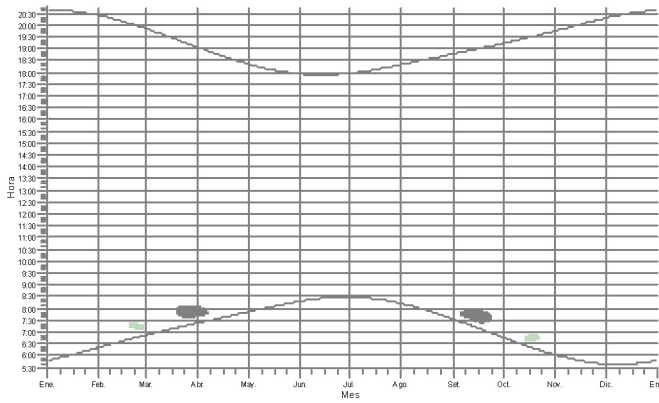
**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

|             |                        |                                  |   |                                       |
|-------------|------------------------|----------------------------------|---|---------------------------------------|
| Día del mes | Salida del sol (hh:mm) |                                  | Hora inicial (hh:mm), sombras con centelleo | (Primeras sombras de centelleo de AG) |
|             | Puesta de sol (hh:mm)  | Minutos con sombras de centelleo | Hora Final (hh:mm), sombras con centelleo   | (Últimas sombras de centelleo de AG)  |

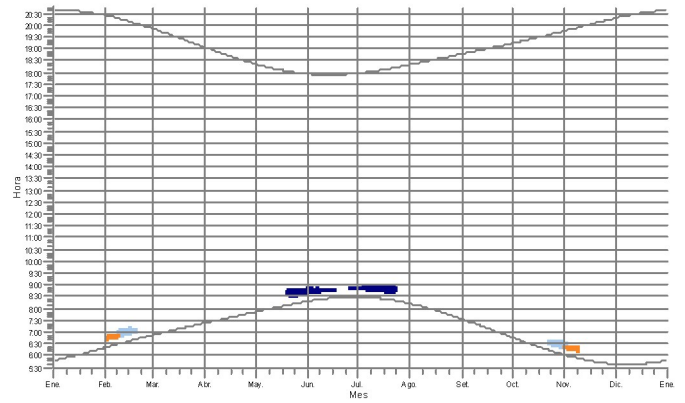
## SHADOW - Calendario, gráfico

Cálculo: Restricciones nuevas 14.07

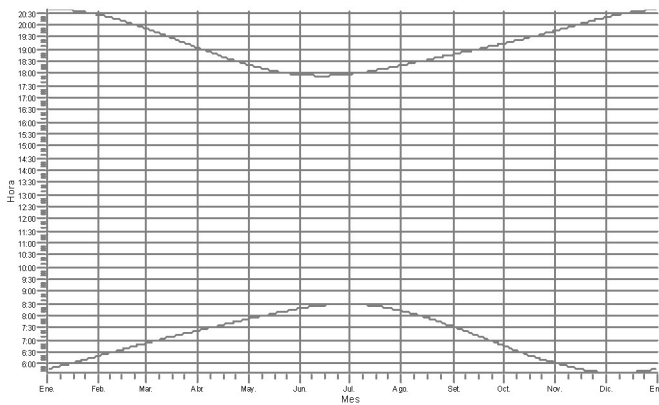
Punto 1: Punto 1



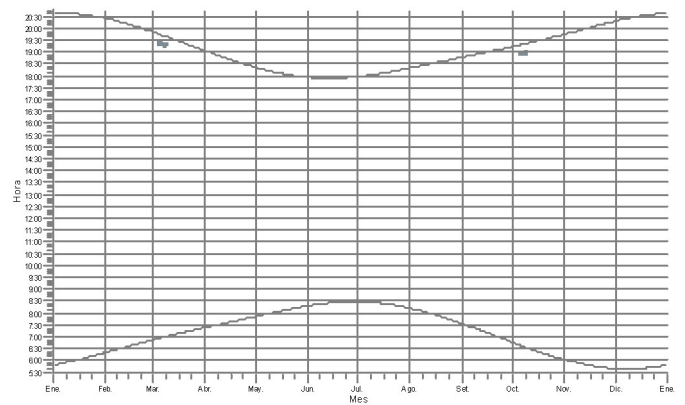
Punto 2: Punto 2



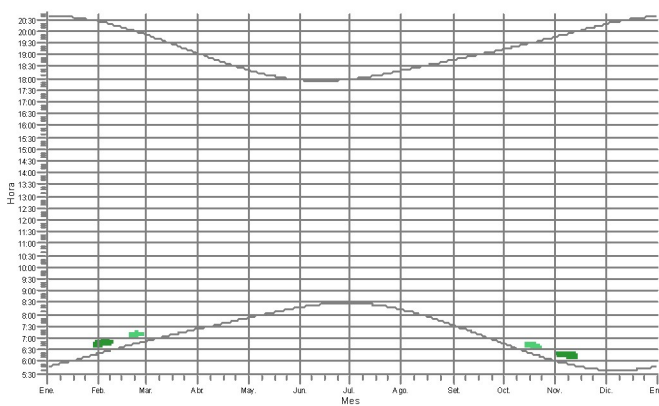
Punto 3: Punto 3



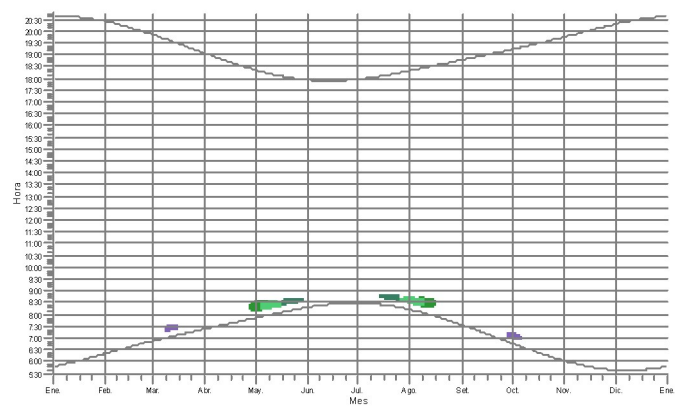
Punto 4: Punto 4



Punto 5: Punto 5



Punto 6: Punto 6



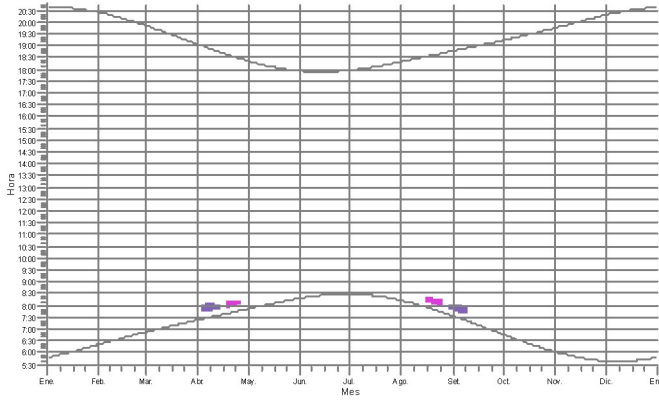
AGs

- |  |  |  |
|--|--|--|
| <ul style="list-style-type: none"> <li>4: GAMESA G114 2650 114.0 IOI hub: 93,0 m (TOT: 150,0 m) (670)</li> <li>7: GAMESA G114 2650 114.0 IOI hub: 93,0 m (TOT: 150,0 m) (651)</li> <li>14: GAMESA G114 2650 114.0 IOI hub: 93,0 m (TOT: 150,0 m) (673)</li> <li>15: GAMESA G114 2650 114.0 IOI hub: 93,0 m (TOT: 150,0 m) (678)</li> </ul> | <ul style="list-style-type: none"> <li>23: GAMESA G114 2650 114.0 IOI hub: 93,0 m (TOT: 150,0 m) (648)</li> <li>27: GAMESA G114 2650 114.0 IOI hub: 93,0 m (TOT: 150,0 m) (642)</li> <li>28: GAMESA G114 2650 114.0 IOI hub: 93,0 m (TOT: 150,0 m) (645)</li> <li>29: GAMESA G114 2650 114.0 IOI hub: 93,0 m (TOT: 150,0 m) (649)</li> </ul> | <ul style="list-style-type: none"> <li>34: GAMESA G114 2650 114.0 IOI hub: 93,0 m (TOT: 150,0 m) (643)</li> <li>38: GAMESA G114 2650 114.0 IOI hub: 93,0 m (TOT: 150,0 m) (659)</li> </ul> |
|--|--|--|

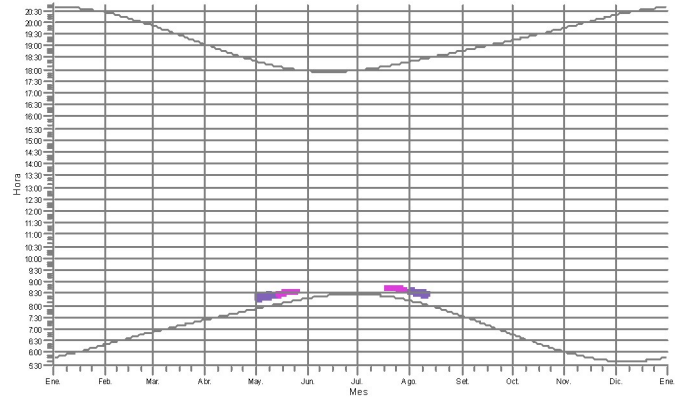
## SHADOW - Calendario, gráfico

**Cálculo:** Restricciones nuevas 14.07

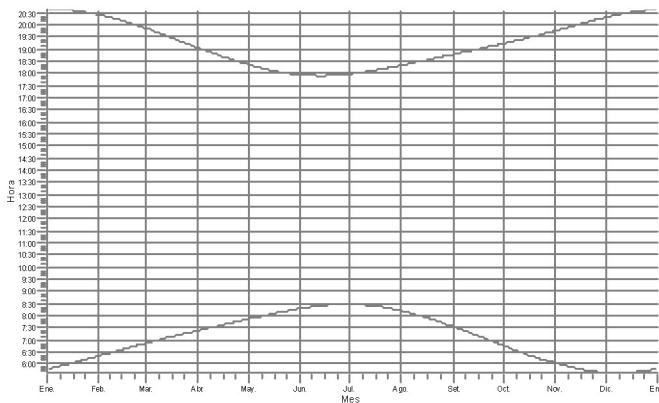
Punto 7: Punto 7



Punto 8: Punto 8



Punto 9: Punto 9



AGS

34: GAMESA G114 2650 114.0 IO! hub: 93,0 m (TOT: 150,0 m) (643)

35: GAMESA G114 2650 114.0 IO! hub: 93,0 m (TOT: 150,0 m) (646)

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 1 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (655)  
**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:03 | 07:51<br>18:21 | 08:17<br>17:56 | 08:28<br>17:58 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:52<br>18:20 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:31<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>19:00 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:47 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:24<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:28<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48 | 05:38<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:57 | 07:54<br>18:16 | 08:20<br>17:54 | 08:27<br>18:00 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:17 | 05:57<br>19:49 | 05:38<br>20:21 |
| 6                                 | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:24 | 07:25<br>18:51 | 06:37<br>19:18 | 05:56<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:53<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:01 | 08:05<br>18:24 | 07:23<br>18:52 | 06:36<br>19:19 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:54<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:51 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:33<br>19:20 | 05:52<br>19:53 | 05:37<br>20:25 |
| 10                                | 05:55<br>20:36 | 06:31<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:54 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:52<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:48 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:01<br>18:28 | 07:17<br>18:55 | 06:30<br>19:22 | 05:51<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:13 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:57 | 05:38<br>20:27 |
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| 14                                | 06:00<br>20:35 | 06:35<br>20:10 | 07:05<br>19:31 | 07:35<br>18:43 | 08:03<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:31 | 07:12<br>18:58 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:29 |
| 15                                | 06:01<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:28 | 07:37<br>18:40 | 08:04<br>18:06 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:39<br>20:06 | 07:08<br>19:26 | 07:38<br>18:39 | 08:05<br>18:05 | 08:25<br>17:54 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:46<br>20:02 | 05:39<br>20:31 |
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| 20                                | 06:06<br>20:33 | 06:42<br>20:03 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:17<br>19:31 | 05:43<br>20:06 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:09<br>18:02 | 08:27<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:20<br>18:11 | 07:47<br>18:38 | 06:59<br>19:05 | 06:14<br>19:34 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:10<br>20:31 | 06:45<br>19:59 | 07:14<br>19:17 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:55 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:06 | 06:12<br>19:35 | 05:42<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:13 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:55<br>19:07 | 06:10<br>19:37 | 05:41<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:49<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:13<br>17:59 | 08:27<br>17:56 | 08:17<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:50<br>19:53 | 07:18<br>19:10 | 07:47<br>18:26 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:44<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:52 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:58 | 08:28<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:27 |                | 07:20<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:28<br>17:57 | 08:14<br>18:17 | 07:37<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:18<br>20:26 |                | 07:21<br>19:06 | 07:50<br>18:22 | 08:16<br>17:57 | 08:28<br>17:57 | 08:13<br>18:18 | 07:35<br>18:45 | 06:47<br>19:12 | 06:03<br>19:42 | 05:39<br>20:16 | 05:46<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:22<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:34<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

Día del mes      Salida del sol (hh:mm)      Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm)      Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 2 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (660)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero | Febrero | Marzo | Abril | Mayo  | Junio | Julio | Agosto | Septiembre | Octubre | Noviembre | Diciembre |
|-----------------------------------|-------|---------|-------|-------|-------|-------|-------|--------|------------|---------|-----------|-----------|
| 1                                 | 05:47 | 06:20   | 06:52 | 07:22 | 07:51 | 08:17 | 08:27 | 08:11  | 07:32      | 06:45   | 06:01     | 05:38     |
|                                   | 20:37 | 20:24   | 19:50 | 19:03 | 18:21 | 17:56 | 17:57 | 18:19  | 18:46      | 19:13   | 19:44     | 20:17     |
| 2                                 | 05:48 | 06:21   | 06:53 | 07:23 | 07:52 | 08:18 | 08:27 | 08:10  | 07:31      | 06:43   | 06:00     | 05:38     |
|                                   | 20:37 | 20:23   | 19:49 | 19:01 | 18:20 | 17:55 | 17:58 | 18:20  | 18:47      | 19:14   | 19:45     | 20:18     |
| 3                                 | 05:49 | 06:22   | 06:54 | 07:24 | 07:52 | 08:18 | 08:27 | 08:09  | 07:29      | 06:42   | 05:59     | 05:38     |
|                                   | 20:37 | 20:22   | 19:47 | 19:00 | 18:18 | 17:55 | 17:58 | 18:21  | 18:48      | 19:15   | 19:47     | 20:19     |
| 4                                 | 05:50 | 06:24   | 06:55 | 07:25 | 07:53 | 08:19 | 08:27 | 08:08  | 07:28      | 06:40   | 05:58     | 05:38     |
|                                   | 20:37 | 20:21   | 19:46 | 18:58 | 18:17 | 17:55 | 17:59 | 18:22  | 18:49      | 19:16   | 19:48     | 20:20     |
| 5                                 | 05:51 | 06:25   | 06:56 | 07:26 | 07:54 | 08:20 | 08:27 | 08:07  | 07:26      | 06:39   | 05:57     | 05:38     |
|                                   | 20:37 | 20:20   | 19:44 | 18:57 | 18:16 | 17:54 | 17:59 | 18:23  | 18:50      | 19:17   | 19:49     | 20:21     |
| 6                                 | 05:52 | 06:26   | 06:57 | 07:27 | 07:55 | 08:20 | 08:27 | 08:06  | 07:25      | 06:37   | 05:56     | 05:37     |
|                                   | 20:37 | 20:19   | 19:43 | 18:55 | 18:15 | 17:54 | 18:00 | 18:24  | 18:51      | 19:18   | 19:50     | 20:22     |
| 7                                 | 05:53 | 06:27   | 06:58 | 07:28 | 07:56 | 08:21 | 08:27 | 08:05  | 07:23      | 06:36   | 05:54     | 05:37     |
|                                   | 20:37 | 20:18   | 19:41 | 18:53 | 18:14 | 17:54 | 18:01 | 18:24  | 18:52      | 19:19   | 19:51     | 20:23     |
| 8                                 | 05:54 | 06:28   | 06:59 | 07:29 | 07:57 | 08:21 | 08:26 | 08:04  | 07:21      | 06:34   | 05:53     | 05:37     |
|                                   | 20:37 | 20:17   | 19:40 | 18:52 | 18:13 | 17:54 | 18:01 | 18:25  | 18:52      | 19:19   | 19:52     | 20:24     |
| 9                                 | 05:54 | 06:29   | 07:00 | 07:30 | 07:58 | 08:22 | 08:26 | 08:03  | 07:20      | 06:33   | 05:52     | 05:37     |
|                                   | 20:37 | 20:16   | 19:38 | 18:50 | 18:12 | 17:54 | 18:02 | 18:26  | 18:53      | 19:20   | 19:53     | 20:25     |
| 10                                | 05:55 | 06:31   | 07:01 | 07:31 | 07:59 | 08:22 | 08:26 | 08:02  | 07:18      | 06:31   | 05:52     | 05:37     |
|                                   | 20:36 | 20:15   | 19:37 | 18:49 | 18:11 | 17:54 | 18:02 | 18:27  | 18:54      | 19:21   | 19:54     | 20:25     |
| 11                                | 05:56 | 06:32   | 07:02 | 07:32 | 08:00 | 08:23 | 08:25 | 08:01  | 07:17      | 06:30   | 05:51     | 05:37     |
|                                   | 20:36 | 20:14   | 19:35 | 18:48 | 18:10 | 17:53 | 18:03 | 18:28  | 18:55      | 19:22   | 19:55     | 20:26     |
| 12                                | 05:57 | 06:33   | 07:03 | 07:33 | 08:01 | 08:23 | 08:25 | 07:59  | 07:15      | 06:28   | 05:50     | 05:38     |
|                                   | 20:36 | 20:13   | 19:34 | 18:46 | 18:09 | 17:53 | 18:04 | 18:29  | 18:56      | 19:23   | 19:57     | 20:27     |
| 13                                | 05:59 | 06:34   | 07:04 | 07:34 | 08:02 | 08:24 | 08:25 | 07:58  | 07:14      | 06:27   | 05:49     | 05:38     |
|                                   | 20:36 | 20:11   | 19:32 | 18:45 | 18:08 | 17:53 | 18:04 | 18:30  | 18:57      | 19:24   | 19:58     | 20:28     |
| 14                                | 06:00 | 06:35   | 07:05 | 07:35 | 08:02 | 08:24 | 08:24 | 07:57  | 07:12      | 06:25   | 05:48     | 05:38     |
|                                   | 20:35 | 20:10   | 19:31 | 18:43 | 18:07 | 17:53 | 18:05 | 18:31  | 18:58      | 19:25   | 19:59     | 20:28     |
| 15                                | 06:01 | 06:36   | 07:06 | 07:36 | 08:03 | 08:25 | 08:24 | 07:56  | 07:10      | 06:24   | 05:47     | 05:38     |
|                                   | 20:35 | 20:09   | 19:29 | 18:42 | 18:06 | 17:53 | 18:06 | 18:31  | 18:58      | 19:26   | 20:00     | 20:29     |
| 16                                | 06:02 | 06:37   | 07:07 | 07:37 | 08:04 | 08:25 | 08:23 | 07:54  | 07:09      | 06:22   | 05:46     | 05:38     |
|                                   | 20:35 | 20:08   | 19:28 | 18:40 | 18:06 | 17:53 | 18:06 | 18:32  | 18:59      | 19:27   | 20:01     | 20:30     |
| 17                                | 06:03 | 06:39   | 07:08 | 07:37 | 08:05 | 08:25 | 08:23 | 07:53  | 07:07      | 06:21   | 05:46     | 05:39     |
|                                   | 20:34 | 20:06   | 19:26 | 18:39 | 18:05 | 17:54 | 18:07 | 18:33  | 19:00      | 19:28   | 20:02     | 20:31     |
| 18                                | 06:04 | 06:40   | 07:09 | 07:38 | 08:06 | 08:26 | 08:22 | 07:52  | 07:06      | 06:19   | 05:45     | 05:39     |
|                                   | 20:34 | 20:05   | 19:24 | 18:38 | 18:04 | 17:54 | 18:08 | 18:34  | 19:01      | 19:29   | 20:03     | 20:31     |
| 19                                | 06:05 | 06:41   | 07:10 | 07:39 | 08:07 | 08:26 | 08:22 | 07:51  | 07:04      | 06:18   | 05:44     | 05:39     |
|                                   | 20:33 | 20:04   | 19:23 | 18:36 | 18:03 | 17:54 | 18:09 | 18:35  | 19:02      | 19:30   | 20:04     | 20:32     |
| 20                                | 06:06 | 06:42   | 07:11 | 07:40 | 08:08 | 08:26 | 08:21 | 07:49  | 07:02      | 06:17   | 05:43     | 05:40     |
|                                   | 20:33 | 20:03   | 19:21 | 18:35 | 18:02 | 17:54 | 18:09 | 18:36  | 19:03      | 19:31   | 20:06     | 20:32     |
| 21                                | 06:07 | 06:43   | 07:12 | 07:41 | 08:09 | 08:27 | 08:20 | 07:48  | 07:01      | 06:15   | 05:43     | 05:40     |
|                                   | 20:32 | 20:01   | 19:20 | 18:33 | 18:02 | 17:54 | 18:10 | 18:37  | 19:04      | 19:32   | 20:07     | 20:33     |
| 22                                | 06:08 | 06:44   | 07:13 | 07:42 | 08:09 | 08:27 | 08:20 | 07:46  | 06:59      | 06:14   | 05:42     | 05:41     |
|                                   | 20:32 | 20:00   | 19:18 | 18:32 | 18:01 | 17:54 | 18:11 | 18:38  | 19:05      | 19:34   | 20:08     | 20:33     |
| 23                                | 06:10 | 06:45   | 07:14 | 07:43 | 08:10 | 08:27 | 08:19 | 07:45  | 06:58      | 06:12   | 05:42     | 05:41     |
|                                   | 20:31 | 19:59   | 19:17 | 18:31 | 18:00 | 17:55 | 18:12 | 18:38  | 19:06      | 19:35   | 20:09     | 20:34     |
| 24                                | 06:11 | 06:46   | 07:15 | 07:44 | 08:11 | 08:27 | 08:18 | 07:44  | 06:56      | 06:11   | 05:41     | 05:42     |
|                                   | 20:30 | 19:57   | 19:15 | 18:29 | 18:00 | 17:55 | 18:13 | 18:39  | 19:06      | 19:36   | 20:10     | 20:34     |
| 25                                | 06:12 | 06:47   | 07:16 | 07:45 | 08:12 | 08:27 | 08:17 | 07:42  | 06:54      | 06:10   | 05:41     | 05:42     |
|                                   | 20:30 | 19:56   | 19:13 | 18:28 | 17:59 | 17:55 | 18:13 | 18:40  | 19:07      | 19:37   | 20:11     | 20:35     |
| 26                                | 06:13 | 06:49   | 07:17 | 07:46 | 08:13 | 08:27 | 08:17 | 07:41  | 06:53      | 06:08   | 05:40     | 05:43     |
|                                   | 20:29 | 19:54   | 19:12 | 18:27 | 17:59 | 17:56 | 18:14 | 18:41  | 19:08      | 19:38   | 20:12     | 20:35     |
| 27                                | 06:14 | 06:50   | 07:18 | 07:47 | 08:13 | 08:27 | 08:16 | 07:39  | 06:51      | 06:07   | 05:40     | 05:44     |
|                                   | 20:28 | 19:53   | 19:10 | 18:26 | 17:58 | 17:56 | 18:15 | 18:42  | 19:09      | 19:39   | 20:13     | 20:35     |
| 28                                | 06:15 | 06:51   | 07:19 | 07:48 | 08:14 | 08:28 | 08:15 | 07:38  | 06:50      | 06:06   | 05:39     | 05:44     |
|                                   | 20:27 | 19:52   | 19:09 | 18:24 | 17:58 | 17:56 | 18:16 | 18:43  | 19:10      | 19:40   | 20:14     | 20:36     |
| 29                                | 06:16 |         | 07:20 | 07:49 | 08:15 | 08:28 | 08:14 | 07:37  | 06:48      | 06:05   | 05:39     | 05:45     |
|                                   | 20:27 |         | 19:07 | 18:23 | 17:57 | 17:57 | 18:17 | 18:44  | 19:11      | 19:41   | 20:15     | 20:36     |
| 30                                | 06:18 |         | 07:21 | 07:50 | 08:16 | 08:28 | 08:13 | 07:35  | 06:47      | 06:03   | 05:39     | 05:46     |
|                                   | 20:26 |         | 19:06 | 18:22 | 17:57 | 17:57 | 18:18 | 18:45  | 19:12      | 19:42   | 20:16     | 20:36     |
| 31                                | 06:19 |         | 07:21 |       | 08:16 |       | 08:12 | 07:34  |            | 06:02   |           | 05:46     |
|                                   | 20:25 |         | 19:04 |       | 17:56 |       | 18:18 | 18:45  |            | 19:43   |           | 20:36     |
| Horas de sol potenciales          | 450   | 380     | 383   | 333   | 311   | 285   | 302   | 330    | 355        | 406     | 426       | 459       |
| Suma de los minutos con centelleo | 0     | 0       | 0     | 0     | 0     | 0     | 0     | 0      | 0          | 0       | 0         | 0         |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 3 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (661)  
**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                                   | Enero | Febrero | Marzo | Abril | Mayo  | Junio | Julio | Agosto | Septiembre | Octubre | Noviembre | Diciembre |
|-----------------------------------|-------|---------|-------|-------|-------|-------|-------|--------|------------|---------|-----------|-----------|
| 1                                 | 05:47 | 06:20   | 06:52 | 07:22 | 07:51 | 08:17 | 08:27 | 08:11  | 07:32      | 06:45   | 06:01     | 05:38     |
|                                   | 20:37 | 20:24   | 19:50 | 19:03 | 18:21 | 17:56 | 17:57 | 18:19  | 18:46      | 19:13   | 19:44     | 20:17     |
| 2                                 | 05:48 | 06:21   | 06:53 | 07:23 | 07:51 | 08:18 | 08:27 | 08:10  | 07:31      | 06:43   | 06:00     | 05:38     |
|                                   | 20:37 | 20:23   | 19:49 | 19:01 | 18:20 | 17:55 | 17:58 | 18:20  | 18:47      | 19:14   | 19:45     | 20:18     |
| 3                                 | 05:49 | 06:22   | 06:54 | 07:24 | 07:52 | 08:18 | 08:27 | 08:09  | 07:29      | 06:42   | 05:59     | 05:38     |
|                                   | 20:37 | 20:22   | 19:47 | 19:00 | 18:18 | 17:55 | 17:58 | 18:21  | 18:48      | 19:15   | 19:46     | 20:19     |
| 4                                 | 05:50 | 06:24   | 06:55 | 07:25 | 07:53 | 08:19 | 08:27 | 08:08  | 07:28      | 06:40   | 05:58     | 05:38     |
|                                   | 20:37 | 20:21   | 19:46 | 18:58 | 18:17 | 17:55 | 17:59 | 18:22  | 18:49      | 19:16   | 19:48     | 20:20     |
| 5                                 | 05:51 | 06:25   | 06:56 | 07:26 | 07:54 | 08:19 | 08:27 | 08:07  | 07:26      | 06:39   | 05:57     | 05:38     |
|                                   | 20:37 | 20:20   | 19:44 | 18:56 | 18:16 | 17:54 | 17:59 | 18:23  | 18:50      | 19:17   | 19:49     | 20:21     |
| 6                                 | 05:52 | 06:26   | 06:57 | 07:27 | 07:55 | 08:20 | 08:27 | 08:06  | 07:24      | 06:37   | 05:55     | 05:37     |
|                                   | 20:37 | 20:19   | 19:43 | 18:55 | 18:15 | 17:54 | 18:00 | 18:23  | 18:51      | 19:18   | 19:50     | 20:22     |
| 7                                 | 05:53 | 06:27   | 06:58 | 07:28 | 07:56 | 08:21 | 08:27 | 08:05  | 07:23      | 06:36   | 05:54     | 05:37     |
|                                   | 20:37 | 20:18   | 19:41 | 18:53 | 18:14 | 17:54 | 18:01 | 18:24  | 18:51      | 19:18   | 19:51     | 20:23     |
| 8                                 | 05:54 | 06:28   | 06:59 | 07:29 | 07:57 | 08:21 | 08:26 | 08:04  | 07:21      | 06:34   | 05:53     | 05:37     |
|                                   | 20:37 | 20:17   | 19:40 | 18:52 | 18:13 | 17:54 | 18:01 | 18:25  | 18:52      | 19:19   | 19:52     | 20:24     |
| 9                                 | 05:54 | 06:29   | 07:00 | 07:30 | 07:58 | 08:22 | 08:26 | 08:03  | 07:20      | 06:33   | 05:52     | 05:37     |
|                                   | 20:37 | 20:16   | 19:38 | 18:50 | 18:12 | 17:54 | 18:02 | 18:26  | 18:53      | 19:20   | 19:53     | 20:25     |
| 10                                | 05:55 | 06:31   | 07:01 | 07:31 | 07:59 | 08:22 | 08:26 | 08:02  | 07:18      | 06:31   | 05:51     | 05:37     |
|                                   | 20:36 | 20:15   | 19:37 | 18:49 | 18:11 | 17:54 | 18:02 | 18:27  | 18:54      | 19:21   | 19:54     | 20:25     |
| 11                                | 05:56 | 06:32   | 07:02 | 07:32 | 08:00 | 08:23 | 08:25 | 08:01  | 07:17      | 06:30   | 05:51     | 05:37     |
|                                   | 20:36 | 20:14   | 19:35 | 18:48 | 18:10 | 17:53 | 18:03 | 18:28  | 18:55      | 19:22   | 19:55     | 20:26     |
| 12                                | 05:57 | 06:33   | 07:03 | 07:33 | 08:01 | 08:23 | 08:25 | 07:59  | 07:15      | 06:28   | 05:50     | 05:38     |
|                                   | 20:36 | 20:13   | 19:34 | 18:46 | 18:09 | 17:53 | 18:04 | 18:29  | 18:56      | 19:23   | 19:57     | 20:27     |
| 13                                | 05:58 | 06:34   | 07:04 | 07:34 | 08:02 | 08:24 | 08:25 | 07:58  | 07:14      | 06:27   | 05:49     | 05:38     |
|                                   | 20:36 | 20:11   | 19:32 | 18:45 | 18:08 | 17:53 | 18:04 | 18:30  | 18:57      | 19:24   | 19:58     | 20:28     |
| 14                                | 06:00 | 06:35   | 07:05 | 07:35 | 08:02 | 08:24 | 08:24 | 07:57  | 07:12      | 06:25   | 05:48     | 05:38     |
|                                   | 20:35 | 20:10   | 19:31 | 18:43 | 18:07 | 17:53 | 18:05 | 18:30  | 18:58      | 19:25   | 19:59     | 20:28     |
| 15                                | 06:01 | 06:36   | 07:06 | 07:36 | 08:03 | 08:25 | 08:24 | 07:56  | 07:10      | 06:24   | 05:47     | 05:38     |
|                                   | 20:35 | 20:09   | 19:29 | 18:42 | 18:06 | 17:53 | 18:06 | 18:31  | 18:58      | 19:26   | 20:00     | 20:29     |
| 16                                | 06:02 | 06:37   | 07:07 | 07:37 | 08:04 | 08:25 | 08:23 | 07:54  | 07:09      | 06:22   | 05:46     | 05:38     |
|                                   | 20:35 | 20:08   | 19:27 | 18:40 | 18:06 | 17:53 | 18:06 | 18:32  | 18:59      | 19:27   | 20:01     | 20:30     |
| 17                                | 06:03 | 06:39   | 07:08 | 07:37 | 08:05 | 08:25 | 08:23 | 07:53  | 07:07      | 06:21   | 05:46     | 05:39     |
|                                   | 20:34 | 20:06   | 19:26 | 18:39 | 18:05 | 17:53 | 18:07 | 18:33  | 19:00      | 19:28   | 20:02     | 20:30     |
| 18                                | 06:04 | 06:40   | 07:09 | 07:38 | 08:06 | 08:26 | 08:22 | 07:52  | 07:06      | 06:19   | 05:45     | 05:39     |
|                                   | 20:34 | 20:05   | 19:24 | 18:37 | 18:04 | 17:54 | 18:08 | 18:34  | 19:01      | 19:29   | 20:03     | 20:31     |
| 19                                | 06:05 | 06:41   | 07:10 | 07:39 | 08:07 | 08:26 | 08:21 | 07:50  | 07:04      | 06:18   | 05:44     | 05:39     |
|                                   | 20:33 | 20:04   | 19:23 | 18:36 | 18:03 | 17:54 | 18:09 | 18:35  | 19:02      | 19:30   | 20:04     | 20:32     |
| 20                                | 06:06 | 06:42   | 07:11 | 07:40 | 08:08 | 08:26 | 08:21 | 07:49  | 07:02      | 06:16   | 05:43     | 05:40     |
|                                   | 20:33 | 20:03   | 19:21 | 18:35 | 18:02 | 17:54 | 18:09 | 18:36  | 19:03      | 19:31   | 20:05     | 20:32     |
| 21                                | 06:07 | 06:43   | 07:12 | 07:41 | 08:08 | 08:27 | 08:20 | 07:48  | 07:01      | 06:15   | 05:43     | 05:40     |
|                                   | 20:32 | 20:01   | 19:20 | 18:33 | 18:02 | 17:54 | 18:10 | 18:37  | 19:04      | 19:32   | 20:07     | 20:33     |
| 22                                | 06:08 | 06:44   | 07:13 | 07:42 | 08:09 | 08:27 | 08:20 | 07:46  | 06:59      | 06:14   | 05:42     | 05:41     |
|                                   | 20:32 | 20:00   | 19:18 | 18:32 | 18:01 | 17:54 | 18:11 | 18:37  | 19:05      | 19:33   | 20:08     | 20:33     |
| 23                                | 06:09 | 06:45   | 07:14 | 07:43 | 08:10 | 08:27 | 08:19 | 07:45  | 06:58      | 06:12   | 05:42     | 05:41     |
|                                   | 20:31 | 19:58   | 19:17 | 18:31 | 18:00 | 17:55 | 18:12 | 18:38  | 19:06      | 19:35   | 20:09     | 20:34     |
| 24                                | 06:11 | 06:46   | 07:15 | 07:44 | 08:11 | 08:27 | 08:18 | 07:44  | 06:56      | 06:11   | 05:41     | 05:42     |
|                                   | 20:30 | 19:57   | 19:15 | 18:29 | 18:00 | 17:55 | 18:13 | 18:39  | 19:06      | 19:36   | 20:10     | 20:34     |
| 25                                | 06:12 | 06:47   | 07:16 | 07:45 | 08:12 | 08:27 | 08:17 | 07:42  | 06:54      | 06:10   | 05:41     | 05:42     |
|                                   | 20:30 | 19:56   | 19:13 | 18:28 | 17:59 | 17:55 | 18:13 | 18:40  | 19:07      | 19:37   | 20:11     | 20:35     |
| 26                                | 06:13 | 06:48   | 07:17 | 07:46 | 08:12 | 08:27 | 08:17 | 07:41  | 06:53      | 06:08   | 05:40     | 05:43     |
|                                   | 20:29 | 19:54   | 19:12 | 18:27 | 17:59 | 17:55 | 18:14 | 18:41  | 19:08      | 19:38   | 20:12     | 20:35     |
| 27                                | 06:14 | 06:50   | 07:18 | 07:47 | 08:13 | 08:27 | 08:16 | 07:39  | 06:51      | 06:07   | 05:40     | 05:44     |
|                                   | 20:28 | 19:53   | 19:10 | 18:26 | 17:58 | 17:56 | 18:15 | 18:42  | 19:09      | 19:39   | 20:13     | 20:35     |
| 28                                | 06:15 | 06:51   | 07:19 | 07:48 | 08:14 | 08:27 | 08:15 | 07:38  | 06:50      | 06:06   | 05:39     | 05:44     |
|                                   | 20:27 | 19:51   | 19:09 | 18:24 | 17:57 | 17:56 | 18:16 | 18:43  | 19:10      | 19:40   | 20:14     | 20:36     |
| 29                                | 06:16 |         | 07:20 | 07:49 | 08:15 | 08:27 | 08:14 | 07:37  | 06:48      | 06:05   | 05:39     | 05:45     |
|                                   | 20:27 |         | 19:07 | 18:23 | 17:57 | 17:57 | 18:17 | 18:44  | 19:11      | 19:41   | 20:15     | 20:36     |
| 30                                | 06:18 |         | 07:21 | 07:50 | 08:15 | 08:27 | 08:13 | 07:35  | 06:47      | 06:03   | 05:39     | 05:46     |
|                                   | 20:26 |         | 19:06 | 18:22 | 17:57 | 17:57 | 18:17 | 18:44  | 19:12      | 19:42   | 20:16     | 20:36     |
| 31                                | 06:19 |         | 07:21 |       | 08:16 |       | 08:12 | 07:34  |            | 06:02   |           | 05:46     |
|                                   | 20:25 |         | 19:04 |       | 17:56 |       | 18:18 | 18:45  |            | 19:43   |           | 20:36     |
| Horas de sol potenciales          | 450   | 380     | 383   | 333   | 311   | 285   | 302   | 330    | 355        | 406     | 426       | 459       |
| Suma de los minutos con centelleo | 0     | 0       | 0     | 0     | 0     | 0     | 0     | 0      | 0          | 0       | 0         | 0         |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 4 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (670)  
**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |                |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:03 | 07:50<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |                |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:17<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:30<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |                |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |                |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:58<br>19:47 | 05:38<br>20:20 |                |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:17 | 05:56<br>19:49 | 05:37<br>20:21 |                |
| 6                                 | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 07:43-07:46/3  | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:26<br>18:01 | 08:05<br>18:24 | 07:23<br>18:51 | 07:41-07:49/8  | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 07:40-07:51/11 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:36 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 07:38-07:52/14 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:24 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 07:36-07:52/16 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:00<br>18:28 | 07:17<br>18:55 | 07:35-07:53/18 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 07:33-07:53/20 | 06:28<br>19:23 | 05:50<br>19:56 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:45 | 08:01<br>18:08 | 08:24<br>17:53 | 08:24<br>18:04 | 07:58<br>18:30 | 07:13<br>18:57 | 07:31-07:53/22 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:30 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:57 | 07:30-07:53/23 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:01<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:35<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 07:28-07:53/25 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 07:27-07:53/26 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 07:26-07:52/26 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:30 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:54 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 07:26-07:50/24 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 07:27-07:50/23 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 07:27-07:48/21 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:26<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 07:29-07:47/18 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:31 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:26<br>17:54 | 08:19<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 07:30-07:44/14 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:55 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 07:33-07:39/6  | 06:12<br>19:34 | 05:42<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 |                | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 |                | 06:10<br>19:37 | 05:41<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:16<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 |                | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:26 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 |                | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 |                | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:26 |                | 07:19<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:27<br>17:57 | 08:14<br>18:17 | 07:36<br>18:44 | 06:48<br>19:11 |                | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:18<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 |                | 06:03<br>19:42 | 05:39<br>20:16 | 05:46<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 | 07:51<br>18:21 | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:33<br>18:45 |                |                | 06:02<br>19:43 | 05:46<br>20:16 | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 318            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 239            | 73             | 0              | 0              | 0              | 0              | 0              | 318            | 0              | 0              | 0              |

### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

Día del mes      Salida del sol (hh:mm)      Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm)      Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 5 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (656)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero | Febrero | Marzo | Abril | Mayo  | Junio | Julio | Agosto | Septiembre | Octubre | Noviembre | Diciembre |
|-----------------------------------|-------|---------|-------|-------|-------|-------|-------|--------|------------|---------|-----------|-----------|
| 1                                 | 05:47 | 06:20   | 06:52 | 07:22 | 07:51 | 08:17 | 08:27 | 08:11  | 07:32      | 06:45   | 06:01     | 05:38     |
|                                   | 20:37 | 20:24   | 19:50 | 19:03 | 18:21 | 17:56 | 17:57 | 18:19  | 18:46      | 19:13   | 19:44     | 20:17     |
| 2                                 | 05:48 | 06:21   | 06:53 | 07:23 | 07:52 | 08:18 | 08:27 | 08:10  | 07:31      | 06:43   | 06:00     | 05:38     |
|                                   | 20:37 | 20:23   | 19:49 | 19:01 | 18:20 | 17:55 | 17:58 | 18:20  | 18:47      | 19:14   | 19:45     | 20:18     |
| 3                                 | 05:49 | 06:22   | 06:54 | 07:24 | 07:52 | 08:18 | 08:27 | 08:09  | 07:29      | 06:42   | 05:59     | 05:38     |
|                                   | 20:37 | 20:22   | 19:47 | 19:00 | 18:18 | 17:55 | 17:58 | 18:21  | 18:48      | 19:15   | 19:47     | 20:19     |
| 4                                 | 05:50 | 06:24   | 06:55 | 07:25 | 07:53 | 08:19 | 08:27 | 08:08  | 07:28      | 06:40   | 05:58     | 05:38     |
|                                   | 20:37 | 20:21   | 19:46 | 18:58 | 18:17 | 17:55 | 17:59 | 18:22  | 18:49      | 19:16   | 19:48     | 20:20     |
| 5                                 | 05:51 | 06:25   | 06:56 | 07:26 | 07:54 | 08:20 | 08:27 | 08:07  | 07:26      | 06:39   | 05:57     | 05:38     |
|                                   | 20:37 | 20:20   | 19:44 | 18:56 | 18:16 | 17:54 | 17:59 | 18:23  | 18:50      | 19:17   | 19:49     | 20:21     |
| 6                                 | 05:52 | 06:26   | 06:57 | 07:27 | 07:55 | 08:20 | 08:27 | 08:06  | 07:25      | 06:37   | 05:55     | 05:37     |
|                                   | 20:37 | 20:19   | 19:43 | 18:55 | 18:15 | 17:54 | 18:00 | 18:23  | 18:51      | 19:18   | 19:50     | 20:22     |
| 7                                 | 05:53 | 06:27   | 06:58 | 07:28 | 07:56 | 08:21 | 08:27 | 08:05  | 07:23      | 06:36   | 05:54     | 05:37     |
|                                   | 20:37 | 20:18   | 19:41 | 18:53 | 18:14 | 17:54 | 18:01 | 18:24  | 18:51      | 19:19   | 19:51     | 20:23     |
| 8                                 | 05:53 | 06:28   | 06:59 | 07:29 | 07:57 | 08:21 | 08:26 | 08:04  | 07:21      | 06:34   | 05:53     | 05:37     |
|                                   | 20:37 | 20:17   | 19:40 | 18:52 | 18:13 | 17:54 | 18:01 | 18:25  | 18:52      | 19:19   | 19:52     | 20:24     |
| 9                                 | 05:54 | 06:29   | 07:00 | 07:30 | 07:58 | 08:22 | 08:26 | 08:03  | 07:20      | 06:33   | 05:52     | 05:37     |
|                                   | 20:37 | 20:16   | 19:38 | 18:50 | 18:12 | 17:54 | 18:02 | 18:26  | 18:53      | 19:20   | 19:53     | 20:25     |
| 10                                | 05:55 | 06:31   | 07:01 | 07:31 | 07:59 | 08:22 | 08:26 | 08:02  | 07:18      | 06:31   | 05:51     | 05:37     |
|                                   | 20:36 | 20:15   | 19:37 | 18:49 | 18:11 | 17:54 | 18:02 | 18:27  | 18:54      | 19:21   | 19:54     | 20:25     |
| 11                                | 05:56 | 06:32   | 07:02 | 07:32 | 08:00 | 08:23 | 08:25 | 08:01  | 07:17      | 06:30   | 05:51     | 05:37     |
|                                   | 20:36 | 20:14   | 19:35 | 18:48 | 18:10 | 17:53 | 18:03 | 18:28  | 18:55      | 19:22   | 19:55     | 20:26     |
| 12                                | 05:57 | 06:33   | 07:03 | 07:33 | 08:01 | 08:23 | 08:25 | 07:59  | 07:15      | 06:28   | 05:50     | 05:38     |
|                                   | 20:36 | 20:13   | 19:34 | 18:46 | 18:09 | 17:53 | 18:04 | 18:29  | 18:56      | 19:23   | 19:57     | 20:27     |
| 13                                | 05:58 | 06:34   | 07:04 | 07:34 | 08:02 | 08:24 | 08:25 | 07:58  | 07:14      | 06:27   | 05:49     | 05:38     |
|                                   | 20:36 | 20:11   | 19:32 | 18:45 | 18:08 | 17:53 | 18:04 | 18:30  | 18:57      | 19:24   | 19:58     | 20:28     |
| 14                                | 06:00 | 06:35   | 07:05 | 07:35 | 08:02 | 08:24 | 08:24 | 07:57  | 07:12      | 06:25   | 05:48     | 05:38     |
|                                   | 20:35 | 20:10   | 19:31 | 18:43 | 18:07 | 17:53 | 18:05 | 18:30  | 18:58      | 19:25   | 19:59     | 20:29     |
| 15                                | 06:01 | 06:36   | 07:06 | 07:36 | 08:03 | 08:25 | 08:24 | 07:56  | 07:10      | 06:24   | 05:47     | 05:38     |
|                                   | 20:35 | 20:09   | 19:29 | 18:42 | 18:06 | 17:53 | 18:06 | 18:31  | 18:58      | 19:26   | 20:00     | 20:29     |
| 16                                | 06:02 | 06:37   | 07:07 | 07:37 | 08:04 | 08:25 | 08:23 | 07:54  | 07:09      | 06:22   | 05:46     | 05:38     |
|                                   | 20:35 | 20:08   | 19:27 | 18:40 | 18:06 | 17:53 | 18:06 | 18:32  | 18:59      | 19:27   | 20:01     | 20:30     |
| 17                                | 06:03 | 06:39   | 07:08 | 07:37 | 08:05 | 08:25 | 08:23 | 07:53  | 07:07      | 06:21   | 05:46     | 05:39     |
|                                   | 20:34 | 20:06   | 19:26 | 18:39 | 18:05 | 17:53 | 18:07 | 18:33  | 19:00      | 19:28   | 20:02     | 20:31     |
| 18                                | 06:04 | 06:40   | 07:09 | 07:38 | 08:06 | 08:26 | 08:22 | 07:52  | 07:06      | 06:19   | 05:45     | 05:39     |
|                                   | 20:34 | 20:05   | 19:24 | 18:38 | 18:04 | 17:54 | 18:08 | 18:34  | 19:01      | 19:29   | 20:03     | 20:31     |
| 19                                | 06:05 | 06:41   | 07:10 | 07:39 | 08:07 | 08:26 | 08:22 | 07:51  | 07:04      | 06:18   | 05:44     | 05:39     |
|                                   | 20:33 | 20:04   | 19:23 | 18:36 | 18:03 | 17:54 | 18:09 | 18:35  | 19:02      | 19:30   | 20:04     | 20:32     |
| 20                                | 06:06 | 06:42   | 07:11 | 07:40 | 08:08 | 08:26 | 08:21 | 07:49  | 07:02      | 06:16   | 05:43     | 05:40     |
|                                   | 20:33 | 20:03   | 19:21 | 18:35 | 18:02 | 17:54 | 18:09 | 18:36  | 19:03      | 19:31   | 20:06     | 20:32     |
| 21                                | 06:07 | 06:43   | 07:12 | 07:41 | 08:09 | 08:27 | 08:20 | 07:48  | 07:01      | 06:15   | 05:43     | 05:40     |
|                                   | 20:32 | 20:01   | 19:20 | 18:33 | 18:02 | 17:54 | 18:10 | 18:37  | 19:04      | 19:32   | 20:07     | 20:33     |
| 22                                | 06:08 | 06:44   | 07:13 | 07:42 | 08:09 | 08:27 | 08:20 | 07:46  | 06:59      | 06:14   | 05:42     | 05:41     |
|                                   | 20:32 | 20:00   | 19:18 | 18:32 | 18:01 | 17:54 | 18:11 | 18:37  | 19:05      | 19:34   | 20:08     | 20:33     |
| 23                                | 06:09 | 06:45   | 07:14 | 07:43 | 08:10 | 08:27 | 08:19 | 07:45  | 06:58      | 06:12   | 05:42     | 05:41     |
|                                   | 20:31 | 19:59   | 19:17 | 18:31 | 18:00 | 17:55 | 18:12 | 18:38  | 19:06      | 19:35   | 20:09     | 20:34     |
| 24                                | 06:11 | 06:46   | 07:15 | 07:44 | 08:11 | 08:27 | 08:18 | 07:44  | 06:56      | 06:11   | 05:41     | 05:42     |
|                                   | 20:30 | 19:57   | 19:15 | 18:29 | 18:00 | 17:55 | 18:13 | 18:39  | 19:06      | 19:36   | 20:10     | 20:34     |
| 25                                | 06:12 | 06:47   | 07:16 | 07:45 | 08:12 | 08:27 | 08:17 | 07:42  | 06:54      | 06:10   | 05:41     | 05:42     |
|                                   | 20:30 | 19:56   | 19:13 | 18:28 | 17:59 | 17:55 | 18:13 | 18:40  | 19:07      | 19:37   | 20:11     | 20:35     |
| 26                                | 06:13 | 06:48   | 07:17 | 07:46 | 08:13 | 08:27 | 08:17 | 07:41  | 06:53      | 06:08   | 05:40     | 05:43     |
|                                   | 20:29 | 19:54   | 19:12 | 18:27 | 17:59 | 17:55 | 18:14 | 18:41  | 19:08      | 19:38   | 20:12     | 20:35     |
| 27                                | 06:14 | 06:50   | 07:18 | 07:47 | 08:13 | 08:27 | 08:16 | 07:39  | 06:51      | 06:07   | 05:40     | 05:44     |
|                                   | 20:28 | 19:53   | 19:10 | 18:26 | 17:58 | 17:56 | 18:15 | 18:42  | 19:09      | 19:39   | 20:13     | 20:35     |
| 28                                | 06:15 | 06:51   | 07:19 | 07:48 | 08:14 | 08:28 | 08:15 | 07:38  | 06:50      | 06:06   | 05:39     | 05:44     |
|                                   | 20:27 | 19:52   | 19:09 | 18:24 | 17:57 | 17:56 | 18:16 | 18:43  | 19:10      | 19:40   | 20:14     | 20:36     |
| 29                                | 06:16 |         | 07:20 | 07:49 | 08:15 | 08:28 | 08:14 | 07:37  | 06:48      | 06:05   | 05:39     | 05:45     |
|                                   | 20:27 |         | 19:07 | 18:23 | 17:57 | 17:57 | 18:17 | 18:44  | 19:11      | 19:41   | 20:15     | 20:36     |
| 30                                | 06:18 |         | 07:21 | 07:50 | 08:16 | 08:28 | 08:13 | 07:35  | 06:47      | 06:03   | 05:39     | 05:46     |
|                                   | 20:26 |         | 19:06 | 18:22 | 17:57 | 17:57 | 18:17 | 18:44  | 19:12      | 19:42   | 20:16     | 20:36     |
| 31                                | 06:19 |         | 07:21 |       | 08:16 |       | 08:12 | 07:34  |            | 06:02   |           | 05:46     |
|                                   | 20:25 |         | 19:04 |       | 17:56 |       | 18:18 | 18:45  |            | 19:43   |           | 20:36     |
| Horas de sol potenciales          | 450   | 380     | 383   | 333   | 311   | 285   | 302   | 330    | 355        | 406     | 426       | 459       |
| Suma de los minutos con centelleo | 0     | 0       | 0     | 0     | 0     | 0     | 0     | 0      | 0          | 0       | 0         | 0         |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo



## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 6 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (664)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero | Febrero | Marzo | Abril | Mayo  | Junio | Julio | Agosto | Septiembre | Octubre | Noviembre | Diciembre |
|-----------------------------------|-------|---------|-------|-------|-------|-------|-------|--------|------------|---------|-----------|-----------|
| 1                                 | 05:47 | 06:20   | 06:52 | 07:22 | 07:51 | 08:17 | 08:27 | 08:11  | 07:32      | 06:45   | 06:01     | 05:38     |
|                                   | 20:37 | 20:24   | 19:50 | 19:03 | 18:21 | 17:56 | 17:57 | 18:19  | 18:46      | 19:13   | 19:44     | 20:17     |
| 2                                 | 05:48 | 06:21   | 06:53 | 07:23 | 07:52 | 08:18 | 08:27 | 08:10  | 07:31      | 06:43   | 06:00     | 05:38     |
|                                   | 20:37 | 20:23   | 19:49 | 19:01 | 18:20 | 17:55 | 17:58 | 18:20  | 18:47      | 19:14   | 19:45     | 20:18     |
| 3                                 | 05:49 | 06:22   | 06:54 | 07:24 | 07:52 | 08:18 | 08:27 | 08:09  | 07:29      | 06:42   | 05:59     | 05:38     |
|                                   | 20:37 | 20:22   | 19:47 | 19:00 | 18:18 | 17:55 | 17:58 | 18:21  | 18:48      | 19:15   | 19:46     | 20:19     |
| 4                                 | 05:50 | 06:24   | 06:55 | 07:25 | 07:53 | 08:19 | 08:27 | 08:08  | 07:28      | 06:40   | 05:58     | 05:38     |
|                                   | 20:37 | 20:21   | 19:46 | 18:58 | 18:17 | 17:55 | 17:59 | 18:22  | 18:49      | 19:16   | 19:48     | 20:20     |
| 5                                 | 05:51 | 06:25   | 06:56 | 07:26 | 07:54 | 08:20 | 08:27 | 08:07  | 07:26      | 06:39   | 05:57     | 05:38     |
|                                   | 20:37 | 20:20   | 19:44 | 18:56 | 18:16 | 17:54 | 17:59 | 18:23  | 18:50      | 19:17   | 19:49     | 20:21     |
| 6                                 | 05:52 | 06:26   | 06:57 | 07:27 | 07:55 | 08:20 | 08:27 | 08:06  | 07:25      | 06:37   | 05:55     | 05:37     |
|                                   | 20:37 | 20:19   | 19:43 | 18:55 | 18:15 | 17:54 | 18:00 | 18:23  | 18:51      | 19:18   | 19:50     | 20:22     |
| 7                                 | 05:53 | 06:27   | 06:58 | 07:28 | 07:56 | 08:21 | 08:27 | 08:05  | 07:23      | 06:36   | 05:54     | 05:37     |
|                                   | 20:37 | 20:18   | 19:41 | 18:53 | 18:14 | 17:54 | 18:01 | 18:24  | 18:51      | 19:18   | 19:51     | 20:23     |
| 8                                 | 05:53 | 06:28   | 06:59 | 07:29 | 07:57 | 08:21 | 08:26 | 08:04  | 07:21      | 06:34   | 05:53     | 05:37     |
|                                   | 20:37 | 20:17   | 19:40 | 18:52 | 18:13 | 17:54 | 18:01 | 18:25  | 18:52      | 19:19   | 19:52     | 20:24     |
| 9                                 | 05:54 | 06:29   | 07:00 | 07:30 | 07:58 | 08:22 | 08:26 | 08:03  | 07:20      | 06:33   | 05:52     | 05:37     |
|                                   | 20:37 | 20:16   | 19:38 | 18:50 | 18:12 | 17:54 | 18:02 | 18:26  | 18:53      | 19:20   | 19:53     | 20:25     |
| 10                                | 05:55 | 06:31   | 07:01 | 07:31 | 07:59 | 08:22 | 08:26 | 08:02  | 07:18      | 06:31   | 05:51     | 05:37     |
|                                   | 20:36 | 20:15   | 19:37 | 18:49 | 18:11 | 17:54 | 18:02 | 18:27  | 18:54      | 19:21   | 19:54     | 20:25     |
| 11                                | 05:56 | 06:32   | 07:02 | 07:32 | 08:00 | 08:23 | 08:25 | 08:01  | 07:17      | 06:30   | 05:51     | 05:37     |
|                                   | 20:36 | 20:14   | 19:35 | 18:48 | 18:10 | 17:53 | 18:03 | 18:28  | 18:55      | 19:22   | 19:55     | 20:26     |
| 12                                | 05:57 | 06:33   | 07:03 | 07:33 | 08:01 | 08:23 | 08:25 | 07:59  | 07:15      | 06:28   | 05:50     | 05:38     |
|                                   | 20:36 | 20:13   | 19:34 | 18:46 | 18:09 | 17:53 | 18:04 | 18:29  | 18:56      | 19:23   | 19:57     | 20:27     |
| 13                                | 05:58 | 06:34   | 07:04 | 07:34 | 08:02 | 08:24 | 08:25 | 07:58  | 07:14      | 06:27   | 05:49     | 05:38     |
|                                   | 20:36 | 20:11   | 19:32 | 18:45 | 18:08 | 17:53 | 18:04 | 18:30  | 18:57      | 19:24   | 19:58     | 20:28     |
| 14                                | 06:00 | 06:35   | 07:05 | 07:35 | 08:02 | 08:24 | 08:24 | 07:57  | 07:12      | 06:25   | 05:48     | 05:38     |
|                                   | 20:35 | 20:10   | 19:31 | 18:43 | 18:07 | 17:53 | 18:05 | 18:30  | 18:58      | 19:25   | 19:59     | 20:28     |
| 15                                | 06:01 | 06:36   | 07:06 | 07:36 | 08:03 | 08:25 | 08:24 | 07:56  | 07:10      | 06:24   | 05:47     | 05:38     |
|                                   | 20:35 | 20:09   | 19:29 | 18:42 | 18:06 | 17:53 | 18:06 | 18:31  | 18:58      | 19:26   | 20:00     | 20:29     |
| 16                                | 06:02 | 06:37   | 07:07 | 07:37 | 08:04 | 08:25 | 08:23 | 07:54  | 07:09      | 06:22   | 05:46     | 05:38     |
|                                   | 20:35 | 20:08   | 19:27 | 18:40 | 18:06 | 17:53 | 18:06 | 18:32  | 18:59      | 19:27   | 20:01     | 20:30     |
| 17                                | 06:03 | 06:39   | 07:08 | 07:37 | 08:05 | 08:25 | 08:23 | 07:53  | 07:07      | 06:21   | 05:46     | 05:39     |
|                                   | 20:34 | 20:06   | 19:26 | 18:39 | 18:05 | 17:53 | 18:07 | 18:33  | 19:00      | 19:28   | 20:02     | 20:31     |
| 18                                | 06:04 | 06:40   | 07:09 | 07:38 | 08:06 | 08:26 | 08:22 | 07:52  | 07:06      | 06:19   | 05:45     | 05:39     |
|                                   | 20:34 | 20:05   | 19:24 | 18:37 | 18:04 | 17:54 | 18:08 | 18:34  | 19:01      | 19:29   | 20:03     | 20:31     |
| 19                                | 06:05 | 06:41   | 07:10 | 07:39 | 08:07 | 08:26 | 08:22 | 07:51  | 07:04      | 06:18   | 05:44     | 05:39     |
|                                   | 20:33 | 20:04   | 19:23 | 18:36 | 18:03 | 17:54 | 18:09 | 18:35  | 19:02      | 19:30   | 20:04     | 20:32     |
| 20                                | 06:06 | 06:42   | 07:11 | 07:40 | 08:08 | 08:26 | 08:21 | 07:49  | 07:02      | 06:16   | 05:43     | 05:40     |
|                                   | 20:33 | 20:03   | 19:21 | 18:35 | 18:02 | 17:54 | 18:09 | 18:36  | 19:03      | 19:31   | 20:06     | 20:32     |
| 21                                | 06:07 | 06:43   | 07:12 | 07:41 | 08:08 | 08:27 | 08:20 | 07:48  | 07:01      | 06:15   | 05:43     | 05:40     |
|                                   | 20:32 | 20:01   | 19:20 | 18:33 | 18:02 | 17:54 | 18:10 | 18:37  | 19:04      | 19:32   | 20:07     | 20:33     |
| 22                                | 06:08 | 06:44   | 07:13 | 07:42 | 08:09 | 08:27 | 08:20 | 07:46  | 06:59      | 06:14   | 05:42     | 05:41     |
|                                   | 20:32 | 20:00   | 19:18 | 18:32 | 18:01 | 17:54 | 18:11 | 18:37  | 19:05      | 19:34   | 20:08     | 20:33     |
| 23                                | 06:09 | 06:45   | 07:14 | 07:43 | 08:10 | 08:27 | 08:19 | 07:45  | 06:58      | 06:12   | 05:42     | 05:41     |
|                                   | 20:31 | 19:59   | 19:17 | 18:31 | 18:00 | 17:55 | 18:12 | 18:38  | 19:06      | 19:35   | 20:09     | 20:34     |
| 24                                | 06:11 | 06:46   | 07:15 | 07:44 | 08:11 | 08:27 | 08:18 | 07:44  | 06:56      | 06:11   | 05:41     | 05:42     |
|                                   | 20:30 | 19:57   | 19:15 | 18:29 | 18:00 | 17:55 | 18:13 | 18:39  | 19:06      | 19:36   | 20:10     | 20:34     |
| 25                                | 06:12 | 06:47   | 07:16 | 07:45 | 08:12 | 08:27 | 08:17 | 07:42  | 06:54      | 06:10   | 05:41     | 05:42     |
|                                   | 20:30 | 19:56   | 19:13 | 18:28 | 17:59 | 17:55 | 18:13 | 18:40  | 19:07      | 19:37   | 20:11     | 20:35     |
| 26                                | 06:13 | 06:48   | 07:17 | 07:46 | 08:13 | 08:27 | 08:17 | 07:41  | 06:53      | 06:08   | 05:40     | 05:43     |
|                                   | 20:29 | 19:54   | 19:12 | 18:27 | 17:59 | 17:55 | 18:14 | 18:41  | 19:08      | 19:38   | 20:12     | 20:35     |
| 27                                | 06:14 | 06:50   | 07:18 | 07:47 | 08:13 | 08:27 | 08:16 | 07:39  | 06:51      | 06:07   | 05:40     | 05:44     |
|                                   | 20:28 | 19:53   | 19:10 | 18:26 | 17:58 | 17:56 | 18:15 | 18:42  | 19:09      | 19:39   | 20:13     | 20:35     |
| 28                                | 06:15 | 06:51   | 07:19 | 07:48 | 08:14 | 08:28 | 08:15 | 07:38  | 06:50      | 06:06   | 05:39     | 05:44     |
|                                   | 20:27 | 19:52   | 19:09 | 18:24 | 17:57 | 17:56 | 18:16 | 18:43  | 19:10      | 19:40   | 20:14     | 20:36     |
| 29                                | 06:16 |         | 07:20 | 07:49 | 08:15 | 08:28 | 08:14 | 07:37  | 06:48      | 06:05   | 05:39     | 05:45     |
|                                   | 20:27 |         | 19:07 | 18:23 | 17:57 | 17:57 | 18:17 | 18:44  | 19:11      | 19:41   | 20:15     | 20:36     |
| 30                                | 06:18 |         | 07:21 | 07:50 | 08:16 | 08:28 | 08:13 | 07:35  | 06:47      | 06:03   | 05:39     | 05:46     |
|                                   | 20:26 |         | 19:06 | 18:22 | 17:57 | 17:57 | 18:17 | 18:44  | 19:12      | 19:42   | 20:16     | 20:36     |
| 31                                | 06:19 |         | 07:21 |       | 08:16 |       | 08:12 | 07:34  |            | 06:02   |           | 05:46     |
|                                   | 20:25 |         | 19:04 |       | 17:56 |       | 18:18 | 18:45  |            | 19:43   |           | 20:36     |
| Horas de sol potenciales          | 450   | 380     | 383   | 333   | 311   | 285   | 302   | 330    | 355        | 406     | 426       | 459       |
| Suma de los minutos con centelleo | 0     | 0       | 0     | 0     | 0     | 0     | 0     | 0      | 0          | 0       | 0         | 0         |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 7 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (651)  
**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

- Hace sol todo el día, desde la salida hasta la puesta del sol
- El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol
- El AG está siempre en operación

|                                   | Enero | Febrero | Marzo | Abril | Mayo           | Junio          | Julio          | Agosto | Septiembre     | Octubre | Noviembre | Diciembre |       |       |
|-----------------------------------|-------|---------|-------|-------|----------------|----------------|----------------|--------|----------------|---------|-----------|-----------|-------|-------|
| 1                                 | 05:47 | 06:20   | 06:52 | 07:22 | 07:51          | 08:17          | 08:39-08:49/10 | 08:27  | 08:49-08:52/3  | 08:11   | 07:32     | 06:45     | 06:01 | 05:38 |
|                                   | 20:37 | 20:24   | 19:50 | 19:03 | 18:21          | 17:56          |                | 17:57  |                | 18:19   | 18:46     | 19:13     | 19:44 | 20:17 |
| 2                                 | 05:48 | 06:21   | 06:53 | 07:23 | 07:52          | 08:18          | 08:39-08:48/9  | 08:27  | 08:49-08:53/4  | 08:10   | 07:31     | 06:43     | 06:00 | 05:38 |
|                                   | 20:37 | 20:23   | 19:49 | 19:01 | 18:20          | 17:55          |                | 17:58  |                | 18:20   | 18:47     | 19:14     | 19:45 | 20:18 |
| 3                                 | 05:49 | 06:22   | 06:54 | 07:24 | 07:52          | 08:18          | 08:40-08:48/8  | 08:27  | 08:49-08:53/4  | 08:09   | 07:29     | 06:42     | 05:59 | 05:38 |
|                                   | 20:37 | 20:22   | 19:47 | 19:00 | 18:18          | 17:55          |                | 17:58  |                | 18:21   | 18:48     | 19:15     | 19:46 | 20:19 |
| 4                                 | 05:50 | 06:23   | 06:55 | 07:25 | 07:53          | 08:19          | 08:41-08:49/8  | 08:27  | 08:49-08:54/5  | 08:08   | 07:28     | 06:40     | 05:58 | 05:38 |
|                                   | 20:37 | 20:21   | 19:46 | 18:58 | 18:17          | 17:55          |                | 17:59  |                | 18:22   | 18:49     | 19:16     | 19:48 | 20:20 |
| 5                                 | 05:51 | 06:25   | 06:56 | 07:26 | 07:54          | 08:20          | 08:41-08:48/7  | 08:27  | 08:49-08:54/5  | 08:07   | 07:26     | 06:39     | 05:57 | 05:37 |
|                                   | 20:37 | 20:20   | 19:44 | 18:56 | 18:16          | 17:54          |                | 17:59  |                | 18:23   | 18:50     | 19:17     | 19:49 | 20:21 |
| 6                                 | 05:52 | 06:26   | 06:57 | 07:27 | 07:55          | 08:20          | 08:42-08:48/6  | 08:27  | 08:48-08:54/6  | 08:06   | 07:24     | 06:37     | 05:55 | 05:37 |
|                                   | 20:37 | 20:19   | 19:43 | 18:55 | 18:15          | 17:54          |                | 18:00  |                | 18:23   | 18:51     | 19:18     | 19:50 | 20:22 |
| 7                                 | 05:53 | 06:27   | 06:58 | 07:28 | 07:56          | 08:21          | 08:43-08:49/6  | 08:27  | 08:48-08:55/7  | 08:05   | 07:23     | 06:36     | 05:54 | 05:37 |
|                                   | 20:37 | 20:18   | 19:41 | 18:53 | 18:14          | 17:54          |                | 18:01  |                | 18:24   | 18:51     | 19:18     | 19:51 | 20:23 |
| 8                                 | 05:53 | 06:28   | 06:59 | 07:29 | 07:57          | 08:21          | 08:43-08:48/5  | 08:26  | 08:48-08:55/7  | 08:04   | 07:21     | 06:34     | 05:53 | 05:37 |
|                                   | 20:37 | 20:17   | 19:40 | 18:52 | 18:13          | 17:54          |                | 18:01  |                | 18:25   | 18:52     | 19:19     | 19:52 | 20:24 |
| 9                                 | 05:54 | 06:29   | 07:00 | 07:30 | 07:58          | 08:22          | 08:44-08:48/4  | 08:26  | 08:47-08:55/8  | 08:03   | 07:20     | 06:33     | 05:52 | 05:37 |
|                                   | 20:37 | 20:16   | 19:38 | 18:50 | 18:12          | 17:54          |                | 18:02  |                | 18:26   | 18:53     | 19:20     | 19:53 | 20:25 |
| 10                                | 05:55 | 06:31   | 07:01 | 07:31 | 07:59          | 08:22          | 08:44-08:48/4  | 08:26  | 08:47-08:56/9  | 08:02   | 07:18     | 06:31     | 05:51 | 05:37 |
|                                   | 20:36 | 20:15   | 19:37 | 18:49 | 18:11          | 17:54          |                | 18:02  |                | 18:27   | 18:54     | 19:21     | 19:54 | 20:25 |
| 11                                | 05:56 | 06:32   | 07:02 | 07:32 | 08:00          | 08:23          | 08:45-08:48/3  | 08:25  | 08:47-08:56/9  | 08:01   | 07:17     | 06:30     | 05:51 | 05:37 |
|                                   | 20:36 | 20:14   | 19:35 | 18:47 | 18:10          | 17:53          |                | 18:03  |                | 18:28   | 18:55     | 19:22     | 19:55 | 20:26 |
| 12                                | 05:57 | 06:33   | 07:03 | 07:33 | 08:01          | 08:23          | 08:45-08:48/3  | 08:25  | 08:46-08:56/10 | 07:59   | 07:15     | 06:28     | 05:50 | 05:38 |
|                                   | 20:36 | 20:13   | 19:34 | 18:46 | 18:09          | 17:53          |                | 18:04  |                | 18:29   | 18:56     | 19:23     | 19:57 | 20:27 |
| 13                                | 05:58 | 06:34   | 07:04 | 07:34 | 08:02          | 08:24          | 08:46-08:48/2  | 08:25  | 08:46-08:57/11 | 07:58   | 07:14     | 06:27     | 05:49 | 05:38 |
|                                   | 20:36 | 20:11   | 19:32 | 18:45 | 18:08          | 17:53          |                | 18:04  |                | 18:30   | 18:57     | 19:24     | 19:58 | 20:28 |
| 14                                | 06:00 | 06:35   | 07:05 | 07:35 | 08:02          | 08:24          | 08:46-08:48/2  | 08:24  | 08:45-08:56/11 | 07:57   | 07:12     | 06:25     | 05:48 | 05:38 |
|                                   | 20:35 | 20:10   | 19:31 | 18:43 | 18:07          | 17:53          |                | 18:05  |                | 18:30   | 18:58     | 19:25     | 19:59 | 20:28 |
| 15                                | 06:01 | 06:36   | 07:06 | 07:36 | 08:03          | 08:25          | 08:47-08:48/1  | 08:24  | 08:45-08:57/12 | 07:56   | 07:10     | 06:24     | 05:47 | 05:38 |
|                                   | 20:35 | 20:09   | 19:29 | 18:42 | 18:06          | 17:53          |                | 18:06  |                | 18:31   | 18:58     | 19:26     | 20:00 | 20:29 |
| 16                                | 06:02 | 06:37   | 07:07 | 07:37 | 08:04          | 08:25          | 08:47-08:48/1  | 08:23  | 08:44-08:56/12 | 07:54   | 07:09     | 06:22     | 05:46 | 05:38 |
|                                   | 20:35 | 20:08   | 19:27 | 18:40 | 18:06          | 17:53          |                | 18:06  |                | 18:32   | 18:59     | 19:27     | 20:01 | 20:30 |
| 17                                | 06:03 | 06:39   | 07:08 | 07:37 | 08:05          | 08:25          | 08:47-08:48/1  | 08:23  | 08:44-08:57/13 | 07:53   | 07:07     | 06:21     | 05:45 | 05:39 |
|                                   | 20:34 | 20:06   | 19:26 | 18:39 | 18:05          | 17:53          |                | 18:07  |                | 18:33   | 19:00     | 19:28     | 20:02 | 20:31 |
| 18                                | 06:04 | 06:40   | 07:09 | 07:38 | 08:06          | 08:26          | 08:43-08:56/13 | 07:52  | 07:06          | 06:19   | 05:45     | 05:39     |       |       |
|                                   | 20:34 | 20:05   | 19:24 | 18:37 | 18:04          | 17:54          |                | 18:08  |                | 18:34   | 19:01     | 19:29     | 20:03 | 20:31 |
| 19                                | 06:05 | 06:41   | 07:10 | 07:39 | 08:07          | 08:26          | 08:42-08:55/13 | 07:51  | 07:04          | 06:18   | 05:44     | 05:39     |       |       |
|                                   | 20:33 | 20:04   | 19:23 | 18:36 | 18:03          | 17:54          |                | 18:09  |                | 18:35   | 19:02     | 19:30     | 20:04 | 20:32 |
| 20                                | 06:06 | 06:42   | 07:11 | 07:40 | 08:08          | 08:35-08:42/7  | 08:26          | 08:21  | 08:42-08:56/14 | 07:49   | 07:02     | 06:16     | 05:43 | 05:40 |
|                                   | 20:33 | 20:03   | 19:21 | 18:35 | 18:02          | 17:54          |                | 18:09  |                | 18:36   | 19:03     | 19:31     | 20:06 | 20:32 |
| 21                                | 06:07 | 06:43   | 07:12 | 07:41 | 08:08          | 08:34-08:44/10 | 08:27          | 08:20  | 08:42-08:55/13 | 07:48   | 07:01     | 06:15     | 05:43 | 05:40 |
|                                   | 20:32 | 20:01   | 19:20 | 18:33 | 18:02          | 17:54          |                | 18:10  |                | 18:37   | 19:04     | 19:32     | 20:07 | 20:33 |
| 22                                | 06:08 | 06:44   | 07:13 | 07:42 | 08:09          | 08:33-08:45/12 | 08:27          | 08:20  | 08:43-08:54/11 | 07:46   | 06:59     | 06:14     | 05:42 | 05:41 |
|                                   | 20:32 | 20:00   | 19:18 | 18:32 | 18:01          | 17:54          |                | 18:11  |                | 18:37   | 19:05     | 19:33     | 20:08 | 20:33 |
| 23                                | 06:09 | 06:45   | 07:14 | 07:43 | 08:10          | 08:33-08:46/13 | 08:27          | 08:19  | 08:45-08:53/8  | 07:45   | 06:58     | 06:12     | 05:42 | 05:41 |
|                                   | 20:31 | 19:59   | 19:17 | 18:31 | 18:00          | 17:55          |                | 18:12  |                | 18:38   | 19:06     | 19:35     | 20:09 | 20:34 |
| 24                                | 06:11 | 06:46   | 07:15 | 07:44 | 08:11          | 08:32-08:46/14 | 08:27          | 08:18  | 08:47-08:51/4  | 07:44   | 06:56     | 06:11     | 05:41 | 05:42 |
|                                   | 20:30 | 19:57   | 19:15 | 18:29 | 18:00          | 17:55          |                | 18:13  |                | 18:39   | 19:06     | 19:36     | 20:10 | 20:34 |
| 25                                | 06:12 | 06:47   | 07:16 | 07:45 | 08:12          | 08:33-08:46/13 | 08:27          | 08:17  |                | 07:42   | 06:54     | 06:10     | 05:41 | 05:42 |
|                                   | 20:30 | 19:56   | 19:13 | 18:28 | 17:59          | 17:55          |                | 18:13  |                | 18:40   | 19:07     | 19:37     | 20:11 | 20:35 |
| 26                                | 06:13 | 06:48   | 07:17 | 07:46 | 08:13          | 08:34-08:47/13 | 08:27          | 08:17  |                | 07:41   | 06:53     | 06:08     | 05:40 | 05:43 |
|                                   | 20:29 | 19:54   | 19:12 | 18:27 | 17:59          | 17:55          |                | 18:14  |                | 18:41   | 19:08     | 19:38     | 20:12 | 20:35 |
| 27                                | 06:14 | 06:50   | 07:18 | 07:47 | 08:13          | 08:35-08:47/12 | 08:27          | 08:16  |                | 07:39   | 06:51     | 06:07     | 05:40 | 05:43 |
|                                   | 20:28 | 19:53   | 19:10 | 18:26 | 17:58          | 17:56          |                | 18:15  |                | 18:42   | 19:09     | 19:39     | 20:13 | 20:35 |
| 28                                | 06:15 | 06:51   | 07:19 | 07:48 | 08:14          | 08:36-08:48/12 | 08:28          | 08:15  |                | 07:38   | 06:50     | 06:06     | 05:39 | 05:44 |
|                                   | 20:27 | 19:52   | 19:09 | 18:24 | 17:57          | 17:56          |                | 18:16  |                | 18:43   | 19:10     | 19:40     | 20:14 | 20:36 |
| 29                                | 06:16 | 07:20   | 07:49 | 08:15 | 08:36-08:47/11 | 08:28          | 08:49-08:51/2  | 08:14  |                | 07:37   | 06:48     | 06:05     | 05:39 | 05:45 |
|                                   | 20:27 | 19:07   | 18:23 | 17:57 | 17:57          | 17:57          |                | 18:17  |                | 18:44   | 19:11     | 19:41     | 20:15 | 20:36 |
| 30                                | 06:18 | 07:21   | 07:50 | 08:15 | 08:37-08:48/11 | 08:28          | 08:49-08:51/2  | 08:13  |                | 07:35   | 06:47     | 06:03     | 05:39 | 05:46 |
|                                   | 20:26 | 19:06   | 18:22 | 17:57 | 17:57          | 17:57          |                | 18:17  |                | 18:44   | 19:12     | 19:42     | 20:16 | 20:36 |
| 31                                | 06:19 | 07:21   | 07:50 | 08:15 | 08:38-08:48/10 |                |                | 08:12  |                | 07:34   | 06:47     | 06:02     | 05:40 | 05:46 |
|                                   | 20:25 | 19:04   | 18:21 | 17:56 | 17:56          | 17:56          |                | 18:18  |                | 18:45   | 19:13     | 19:43     | 20:17 | 20:36 |
| Horas de sol potenciales          | 450   | 380     | 383   | 333   | 311            | 285            |                | 302    |                | 330     | 355       | 406       | 426   | 459   |
| Suma de los minutos con centelleo | 0     | 0       | 0     | 0     | 138            | 87             |                | 212    |                | 0       | 0         | 0         | 0     | 0     |

### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

Día del mes Salida del sol (hh:mm) Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 8 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (677)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero | Febrero | Marzo | Abril | Mayo  | Junio | Julio | Agosto | Septiembre | Octubre | Noviembre | Diciembre |
|-----------------------------------|-------|---------|-------|-------|-------|-------|-------|--------|------------|---------|-----------|-----------|
| 1                                 | 05:47 | 06:20   | 06:52 | 07:22 | 07:51 | 08:17 | 08:27 | 08:11  | 07:32      | 06:45   | 06:01     | 05:38     |
|                                   | 20:37 | 20:24   | 19:50 | 19:03 | 18:21 | 17:56 | 17:57 | 18:19  | 18:46      | 19:13   | 19:44     | 20:17     |
| 2                                 | 05:48 | 06:21   | 06:53 | 07:23 | 07:51 | 08:18 | 08:27 | 08:10  | 07:31      | 06:43   | 06:00     | 05:38     |
|                                   | 20:37 | 20:23   | 19:49 | 19:01 | 18:20 | 17:55 | 17:58 | 18:20  | 18:47      | 19:14   | 19:45     | 20:18     |
| 3                                 | 05:49 | 06:22   | 06:54 | 07:24 | 07:52 | 08:18 | 08:27 | 08:09  | 07:29      | 06:42   | 05:59     | 05:38     |
|                                   | 20:37 | 20:22   | 19:47 | 18:59 | 18:18 | 17:55 | 17:58 | 18:21  | 18:48      | 19:15   | 19:46     | 20:19     |
| 4                                 | 05:50 | 06:23   | 06:55 | 07:25 | 07:53 | 08:19 | 08:27 | 08:08  | 07:28      | 06:40   | 05:58     | 05:38     |
|                                   | 20:37 | 20:21   | 19:46 | 18:58 | 18:17 | 17:55 | 17:59 | 18:22  | 18:49      | 19:16   | 19:48     | 20:20     |
| 5                                 | 05:51 | 06:25   | 06:56 | 07:26 | 07:54 | 08:19 | 08:27 | 08:07  | 07:26      | 06:39   | 05:56     | 05:37     |
|                                   | 20:37 | 20:20   | 19:44 | 18:56 | 18:16 | 17:54 | 17:59 | 18:23  | 18:50      | 19:17   | 19:49     | 20:21     |
| 6                                 | 05:52 | 06:26   | 06:57 | 07:27 | 07:55 | 08:20 | 08:27 | 08:06  | 07:24      | 06:37   | 05:55     | 05:37     |
|                                   | 20:37 | 20:19   | 19:43 | 18:55 | 18:15 | 17:54 | 18:00 | 18:23  | 18:51      | 19:17   | 19:50     | 20:22     |
| 7                                 | 05:52 | 06:27   | 06:58 | 07:28 | 07:56 | 08:21 | 08:27 | 08:05  | 07:23      | 06:36   | 05:54     | 05:37     |
|                                   | 20:37 | 20:18   | 19:41 | 18:53 | 18:14 | 17:54 | 18:01 | 18:24  | 18:51      | 19:18   | 19:51     | 20:23     |
| 8                                 | 05:53 | 06:28   | 06:59 | 07:29 | 07:57 | 08:21 | 08:26 | 08:04  | 07:21      | 06:34   | 05:53     | 05:37     |
|                                   | 20:37 | 20:17   | 19:40 | 18:52 | 18:13 | 17:54 | 18:01 | 18:25  | 18:52      | 19:19   | 19:52     | 20:24     |
| 9                                 | 05:54 | 06:29   | 07:00 | 07:30 | 07:58 | 08:22 | 08:26 | 08:03  | 07:20      | 06:33   | 05:52     | 05:37     |
|                                   | 20:37 | 20:16   | 19:38 | 18:50 | 18:12 | 17:54 | 18:02 | 18:26  | 18:53      | 19:20   | 19:53     | 20:25     |
| 10                                | 05:55 | 06:30   | 07:01 | 07:31 | 07:59 | 08:22 | 08:26 | 08:02  | 07:18      | 06:31   | 05:51     | 05:37     |
|                                   | 20:36 | 20:15   | 19:37 | 18:49 | 18:11 | 17:53 | 18:02 | 18:27  | 18:54      | 19:21   | 19:54     | 20:25     |
| 11                                | 05:56 | 06:32   | 07:02 | 07:32 | 08:00 | 08:23 | 08:25 | 08:01  | 07:17      | 06:29   | 05:50     | 05:37     |
|                                   | 20:36 | 20:14   | 19:35 | 18:47 | 18:10 | 17:53 | 18:03 | 18:28  | 18:55      | 19:22   | 19:55     | 20:26     |
| 12                                | 05:57 | 06:33   | 07:03 | 07:33 | 08:01 | 08:23 | 08:25 | 07:59  | 07:15      | 06:28   | 05:50     | 05:37     |
|                                   | 20:36 | 20:13   | 19:34 | 18:46 | 18:09 | 17:53 | 18:04 | 18:29  | 18:56      | 19:23   | 19:57     | 20:27     |
| 13                                | 05:58 | 06:34   | 07:04 | 07:34 | 08:02 | 08:24 | 08:25 | 07:58  | 07:14      | 06:27   | 05:49     | 05:38     |
|                                   | 20:36 | 20:11   | 19:32 | 18:45 | 18:08 | 17:53 | 18:04 | 18:30  | 18:57      | 19:24   | 19:58     | 20:28     |
| 14                                | 05:59 | 06:35   | 07:05 | 07:35 | 08:02 | 08:24 | 08:24 | 07:57  | 07:12      | 06:25   | 05:48     | 05:38     |
|                                   | 20:35 | 20:10   | 19:31 | 18:43 | 18:07 | 17:53 | 18:05 | 18:30  | 18:58      | 19:25   | 19:59     | 20:28     |
| 15                                | 06:01 | 06:36   | 07:06 | 07:36 | 08:03 | 08:25 | 08:24 | 07:56  | 07:10      | 06:24   | 05:47     | 05:38     |
|                                   | 20:35 | 20:09   | 19:29 | 18:42 | 18:06 | 17:53 | 18:06 | 18:31  | 18:58      | 19:26   | 20:00     | 20:29     |
| 16                                | 06:02 | 06:37   | 07:07 | 07:36 | 08:04 | 08:25 | 08:23 | 07:54  | 07:09      | 06:22   | 05:46     | 05:38     |
|                                   | 20:35 | 20:08   | 19:27 | 18:40 | 18:05 | 17:53 | 18:06 | 18:32  | 18:59      | 19:27   | 20:01     | 20:30     |
| 17                                | 06:03 | 06:38   | 07:08 | 07:37 | 08:05 | 08:25 | 08:23 | 07:53  | 07:07      | 06:21   | 05:45     | 05:39     |
|                                   | 20:34 | 20:06   | 19:26 | 18:39 | 18:05 | 17:53 | 18:07 | 18:33  | 19:00      | 19:28   | 20:02     | 20:30     |
| 18                                | 06:04 | 06:40   | 07:09 | 07:38 | 08:06 | 08:26 | 08:22 | 07:52  | 07:06      | 06:19   | 05:45     | 05:39     |
|                                   | 20:34 | 20:05   | 19:24 | 18:37 | 18:04 | 17:54 | 18:08 | 18:34  | 19:01      | 19:29   | 20:03     | 20:31     |
| 19                                | 06:05 | 06:41   | 07:10 | 07:39 | 08:07 | 08:26 | 08:21 | 07:50  | 07:04      | 06:18   | 05:44     | 05:39     |
|                                   | 20:33 | 20:04   | 19:23 | 18:36 | 18:03 | 17:54 | 18:09 | 18:35  | 19:02      | 19:30   | 20:04     | 20:32     |
| 20                                | 06:06 | 06:42   | 07:11 | 07:40 | 08:08 | 08:26 | 08:21 | 07:49  | 07:02      | 06:16   | 05:43     | 05:40     |
|                                   | 20:33 | 20:03   | 19:21 | 18:35 | 18:02 | 17:54 | 18:09 | 18:36  | 19:03      | 19:31   | 20:05     | 20:32     |
| 21                                | 06:07 | 06:43   | 07:12 | 07:41 | 08:08 | 08:27 | 08:20 | 07:48  | 07:01      | 06:15   | 05:43     | 05:40     |
|                                   | 20:32 | 20:01   | 19:20 | 18:33 | 18:02 | 17:54 | 18:10 | 18:37  | 19:04      | 19:32   | 20:07     | 20:33     |
| 22                                | 06:08 | 06:44   | 07:13 | 07:42 | 08:09 | 08:27 | 08:20 | 07:46  | 06:59      | 06:14   | 05:42     | 05:41     |
|                                   | 20:32 | 20:00   | 19:18 | 18:32 | 18:01 | 17:54 | 18:11 | 18:37  | 19:05      | 19:33   | 20:08     | 20:33     |
| 23                                | 06:09 | 06:45   | 07:14 | 07:43 | 08:10 | 08:27 | 08:19 | 07:45  | 06:58      | 06:12   | 05:42     | 05:41     |
|                                   | 20:31 | 19:58   | 19:17 | 18:31 | 18:00 | 17:54 | 18:12 | 18:38  | 19:05      | 19:35   | 20:09     | 20:34     |
| 24                                | 06:11 | 06:46   | 07:15 | 07:44 | 08:11 | 08:27 | 08:18 | 07:44  | 06:56      | 06:11   | 05:41     | 05:42     |
|                                   | 20:30 | 19:57   | 19:15 | 18:29 | 18:00 | 17:55 | 18:12 | 18:39  | 19:06      | 19:36   | 20:10     | 20:34     |
| 25                                | 06:12 | 06:47   | 07:16 | 07:45 | 08:12 | 08:27 | 08:17 | 07:42  | 06:54      | 06:10   | 05:41     | 05:42     |
|                                   | 20:30 | 19:56   | 19:13 | 18:28 | 17:59 | 17:55 | 18:13 | 18:40  | 19:07      | 19:37   | 20:11     | 20:35     |
| 26                                | 06:13 | 06:48   | 07:17 | 07:46 | 08:12 | 08:27 | 08:17 | 07:41  | 06:53      | 06:08   | 05:40     | 05:43     |
|                                   | 20:29 | 19:54   | 19:12 | 18:27 | 17:58 | 17:55 | 18:14 | 18:41  | 19:08      | 19:38   | 20:12     | 20:35     |
| 27                                | 06:14 | 06:50   | 07:18 | 07:47 | 08:13 | 08:27 | 08:16 | 07:39  | 06:51      | 06:07   | 05:40     | 05:43     |
|                                   | 20:28 | 19:53   | 19:10 | 18:26 | 17:58 | 17:56 | 18:15 | 18:42  | 19:09      | 19:39   | 20:13     | 20:35     |
| 28                                | 06:15 | 06:51   | 07:19 | 07:48 | 08:14 | 08:27 | 08:15 | 07:38  | 06:50      | 06:06   | 05:39     | 05:44     |
|                                   | 20:27 | 19:51   | 19:09 | 18:24 | 17:57 | 17:56 | 18:16 | 18:43  | 19:10      | 19:40   | 20:14     | 20:36     |
| 29                                | 06:16 |         | 07:20 | 07:49 | 08:15 | 08:27 | 08:14 | 07:36  | 06:48      | 06:05   | 05:39     | 05:45     |
|                                   | 20:27 |         | 19:07 | 18:23 | 17:57 | 17:57 | 18:17 | 18:44  | 19:11      | 19:41   | 20:15     | 20:36     |
| 30                                | 06:18 |         | 07:20 | 07:50 | 08:15 | 08:27 | 08:13 | 07:35  | 06:46      | 06:03   | 05:39     | 05:46     |
|                                   | 20:26 |         | 19:06 | 18:22 | 17:56 | 17:57 | 18:17 | 18:44  | 19:12      | 19:42   | 20:16     | 20:36     |
| 31                                | 06:19 |         | 07:21 |       | 08:16 |       | 08:12 | 07:34  |            | 06:02   |           | 05:46     |
|                                   | 20:25 |         | 19:04 |       | 17:56 |       | 18:18 | 18:45  |            | 19:43   |           | 20:36     |
| Horas de sol potenciales          | 450   | 380     | 383   | 333   | 311   | 285   | 302   | 330    | 355        | 406     | 426       | 459       |
| Suma de los minutos con centelleo | 0     | 0       | 0     | 0     | 0     | 0     | 0     | 0      | 0          | 0       | 0         | 0         |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 9 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (665)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:03 | 07:51<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:31<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48 | 05:38<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:17 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:24 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:01<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:57 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:45 | 08:02<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:30 | 07:14<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:31 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:58 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:01<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:30 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:54 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:26<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:19<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 | 05:42<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:17<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:26 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:27 |                | 07:20<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:27<br>17:57 | 08:14<br>18:17 | 07:36<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:18<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:39<br>20:16 | 05:46<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:34<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 10 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (647)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:03 | 07:51<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:31<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48 | 05:38<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:17 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:01 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:24 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:00<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:56 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:45 | 08:02<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:30 | 07:13<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:31 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:58 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:01<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:30 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:54 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:26<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:19<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 | 05:42<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:41<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:16<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:26 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:27 |                | 07:19<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:27<br>17:57 | 08:14<br>18:17 | 07:36<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:18<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:39<br>20:16 | 05:46<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:34<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 11 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (666)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:03 | 07:50<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:31<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48 | 05:38<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:17 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:01 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:24 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:00<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:56 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:45 | 08:02<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:30 | 07:13<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:31 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:58 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:01<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:30 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:54 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:26<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:19<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 | 05:42<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:41<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:16<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:26 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:27 |                | 07:19<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:27<br>17:57 | 08:14<br>18:17 | 07:36<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:18<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:39<br>20:16 | 05:46<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:34<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 12 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (667)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero | Febrero | Marzo | Abril | Mayo  | Junio | Julio | Agosto | Septiembre | Octubre | Noviembre | Diciembre |
|-----------------------------------|-------|---------|-------|-------|-------|-------|-------|--------|------------|---------|-----------|-----------|
| 1                                 | 05:47 | 06:20   | 06:52 | 07:22 | 07:50 | 08:17 | 08:27 | 08:11  | 07:32      | 06:45   | 06:01     | 05:38     |
|                                   | 20:37 | 20:24   | 19:50 | 19:03 | 18:21 | 17:56 | 17:57 | 18:19  | 18:46      | 19:13   | 19:44     | 20:17     |
| 2                                 | 05:48 | 06:21   | 06:53 | 07:23 | 07:51 | 08:17 | 08:27 | 08:10  | 07:31      | 06:43   | 06:00     | 05:38     |
|                                   | 20:37 | 20:23   | 19:49 | 19:01 | 18:19 | 17:55 | 17:58 | 18:20  | 18:47      | 19:14   | 19:45     | 20:18     |
| 3                                 | 05:49 | 06:22   | 06:54 | 07:24 | 07:52 | 08:18 | 08:27 | 08:09  | 07:29      | 06:42   | 05:59     | 05:38     |
|                                   | 20:37 | 20:22   | 19:47 | 18:59 | 18:18 | 17:55 | 17:58 | 18:21  | 18:48      | 19:15   | 19:46     | 20:19     |
| 4                                 | 05:50 | 06:23   | 06:55 | 07:25 | 07:53 | 08:19 | 08:27 | 08:08  | 07:27      | 06:40   | 05:58     | 05:38     |
|                                   | 20:37 | 20:21   | 19:46 | 18:58 | 18:17 | 17:55 | 17:59 | 18:22  | 18:49      | 19:16   | 19:48     | 20:20     |
| 5                                 | 05:51 | 06:25   | 06:56 | 07:26 | 07:54 | 08:19 | 08:27 | 08:07  | 07:26      | 06:39   | 05:56     | 05:37     |
|                                   | 20:37 | 20:20   | 19:44 | 18:56 | 18:16 | 17:54 | 17:59 | 18:23  | 18:50      | 19:17   | 19:49     | 20:21     |
| 6                                 | 05:52 | 06:26   | 06:57 | 07:27 | 07:55 | 08:20 | 08:27 | 08:06  | 07:24      | 06:37   | 05:55     | 05:37     |
|                                   | 20:37 | 20:19   | 19:43 | 18:55 | 18:15 | 17:54 | 18:00 | 18:23  | 18:51      | 19:17   | 19:50     | 20:22     |
| 7                                 | 05:52 | 06:27   | 06:58 | 07:28 | 07:56 | 08:21 | 08:26 | 08:05  | 07:23      | 06:36   | 05:54     | 05:37     |
|                                   | 20:37 | 20:18   | 19:41 | 18:53 | 18:14 | 17:54 | 18:01 | 18:24  | 18:51      | 19:18   | 19:51     | 20:23     |
| 8                                 | 05:53 | 06:28   | 06:59 | 07:29 | 07:57 | 08:21 | 08:26 | 08:04  | 07:21      | 06:34   | 05:53     | 05:37     |
|                                   | 20:37 | 20:17   | 19:40 | 18:52 | 18:13 | 17:54 | 18:01 | 18:25  | 18:52      | 19:19   | 19:52     | 20:24     |
| 9                                 | 05:54 | 06:29   | 07:00 | 07:30 | 07:58 | 08:22 | 08:26 | 08:03  | 07:20      | 06:32   | 05:52     | 05:37     |
|                                   | 20:37 | 20:16   | 19:38 | 18:50 | 18:12 | 17:54 | 18:02 | 18:26  | 18:53      | 19:20   | 19:53     | 20:24     |
| 10                                | 05:55 | 06:30   | 07:01 | 07:31 | 07:59 | 08:22 | 08:26 | 08:02  | 07:18      | 06:31   | 05:51     | 05:37     |
|                                   | 20:36 | 20:15   | 19:37 | 18:49 | 18:11 | 17:53 | 18:02 | 18:27  | 18:54      | 19:21   | 19:54     | 20:25     |
| 11                                | 05:56 | 06:32   | 07:02 | 07:32 | 08:00 | 08:23 | 08:25 | 08:00  | 07:17      | 06:29   | 05:50     | 05:37     |
|                                   | 20:36 | 20:14   | 19:35 | 18:47 | 18:10 | 17:53 | 18:03 | 18:28  | 18:55      | 19:22   | 19:55     | 20:26     |
| 12                                | 05:57 | 06:33   | 07:03 | 07:33 | 08:01 | 08:23 | 08:25 | 07:59  | 07:15      | 06:28   | 05:50     | 05:37     |
|                                   | 20:36 | 20:12   | 19:34 | 18:46 | 18:09 | 17:53 | 18:04 | 18:29  | 18:56      | 19:23   | 19:56     | 20:27     |
| 13                                | 05:58 | 06:34   | 07:04 | 07:34 | 08:01 | 08:24 | 08:25 | 07:58  | 07:13      | 06:26   | 05:49     | 05:38     |
|                                   | 20:36 | 20:11   | 19:32 | 18:45 | 18:08 | 17:53 | 18:04 | 18:30  | 18:57      | 19:24   | 19:58     | 20:28     |
| 14                                | 05:59 | 06:35   | 07:05 | 07:35 | 08:02 | 08:24 | 08:24 | 07:57  | 07:12      | 06:25   | 05:48     | 05:38     |
|                                   | 20:35 | 20:10   | 19:30 | 18:43 | 18:07 | 17:53 | 18:05 | 18:30  | 18:57      | 19:25   | 19:59     | 20:28     |
| 15                                | 06:01 | 06:36   | 07:06 | 07:36 | 08:03 | 08:25 | 08:24 | 07:56  | 07:10      | 06:24   | 05:47     | 05:38     |
|                                   | 20:35 | 20:09   | 19:29 | 18:42 | 18:06 | 17:53 | 18:06 | 18:31  | 18:58      | 19:26   | 20:00     | 20:29     |
| 16                                | 06:02 | 06:37   | 07:07 | 07:36 | 08:04 | 08:25 | 08:23 | 07:54  | 07:09      | 06:22   | 05:46     | 05:38     |
|                                   | 20:35 | 20:08   | 19:27 | 18:40 | 18:05 | 17:53 | 18:06 | 18:32  | 18:59      | 19:27   | 20:01     | 20:30     |
| 17                                | 06:03 | 06:38   | 07:08 | 07:37 | 08:05 | 08:25 | 08:23 | 07:53  | 07:07      | 06:21   | 05:45     | 05:39     |
|                                   | 20:34 | 20:06   | 19:26 | 18:39 | 18:05 | 17:53 | 18:07 | 18:33  | 19:00      | 19:28   | 20:02     | 20:30     |
| 18                                | 06:04 | 06:40   | 07:09 | 07:38 | 08:06 | 08:26 | 08:22 | 07:52  | 07:06      | 06:19   | 05:45     | 05:39     |
|                                   | 20:34 | 20:05   | 19:24 | 18:37 | 18:04 | 17:54 | 18:08 | 18:34  | 19:01      | 19:29   | 20:03     | 20:31     |
| 19                                | 06:05 | 06:41   | 07:10 | 07:39 | 08:07 | 08:26 | 08:21 | 07:50  | 07:04      | 06:18   | 05:44     | 05:39     |
|                                   | 20:33 | 20:04   | 19:23 | 18:36 | 18:03 | 17:54 | 18:09 | 18:35  | 19:02      | 19:30   | 20:04     | 20:32     |
| 20                                | 06:06 | 06:42   | 07:11 | 07:40 | 08:08 | 08:26 | 08:21 | 07:49  | 07:02      | 06:16   | 05:43     | 05:40     |
|                                   | 20:33 | 20:02   | 19:21 | 18:35 | 18:02 | 17:54 | 18:09 | 18:36  | 19:03      | 19:31   | 20:05     | 20:32     |
| 21                                | 06:07 | 06:43   | 07:12 | 07:41 | 08:08 | 08:26 | 08:20 | 07:48  | 07:01      | 06:15   | 05:43     | 05:40     |
|                                   | 20:32 | 20:01   | 19:20 | 18:33 | 18:02 | 17:54 | 18:10 | 18:37  | 19:04      | 19:32   | 20:07     | 20:33     |
| 22                                | 06:08 | 06:44   | 07:13 | 07:42 | 08:09 | 08:27 | 08:19 | 07:46  | 06:59      | 06:14   | 05:42     | 05:41     |
|                                   | 20:32 | 20:00   | 19:18 | 18:32 | 18:01 | 17:54 | 18:11 | 18:37  | 19:05      | 19:33   | 20:08     | 20:33     |
| 23                                | 06:09 | 06:45   | 07:14 | 07:43 | 08:10 | 08:27 | 08:19 | 07:45  | 06:58      | 06:12   | 05:42     | 05:41     |
|                                   | 20:31 | 19:58   | 19:16 | 18:31 | 18:00 | 17:55 | 18:12 | 18:38  | 19:05      | 19:34   | 20:09     | 20:34     |
| 24                                | 06:11 | 06:46   | 07:15 | 07:44 | 08:11 | 08:27 | 08:18 | 07:44  | 06:56      | 06:11   | 05:41     | 05:42     |
|                                   | 20:30 | 19:57   | 19:15 | 18:29 | 18:00 | 17:55 | 18:12 | 18:39  | 19:06      | 19:36   | 20:10     | 20:34     |
| 25                                | 06:12 | 06:47   | 07:16 | 07:45 | 08:12 | 08:27 | 08:17 | 07:42  | 06:54      | 06:10   | 05:41     | 05:42     |
|                                   | 20:30 | 19:56   | 19:13 | 18:28 | 17:59 | 17:55 | 18:13 | 18:40  | 19:07      | 19:37   | 20:11     | 20:35     |
| 26                                | 06:13 | 06:48   | 07:17 | 07:46 | 08:12 | 08:27 | 08:16 | 07:41  | 06:53      | 06:08   | 05:40     | 05:43     |
|                                   | 20:29 | 19:54   | 19:12 | 18:27 | 17:58 | 17:55 | 18:14 | 18:41  | 19:08      | 19:38   | 20:12     | 20:35     |
| 27                                | 06:14 | 06:49   | 07:18 | 07:47 | 08:13 | 08:27 | 08:16 | 07:39  | 06:51      | 06:07   | 05:40     | 05:43     |
|                                   | 20:28 | 19:53   | 19:10 | 18:26 | 17:58 | 17:56 | 18:15 | 18:42  | 19:09      | 19:39   | 20:13     | 20:35     |
| 28                                | 06:15 | 06:51   | 07:19 | 07:48 | 08:14 | 08:27 | 08:15 | 07:38  | 06:50      | 06:06   | 05:39     | 05:44     |
|                                   | 20:27 | 19:51   | 19:09 | 18:24 | 17:57 | 17:56 | 18:16 | 18:43  | 19:10      | 19:40   | 20:14     | 20:36     |
| 29                                | 06:16 |         | 07:19 | 07:49 | 08:15 | 08:27 | 08:14 | 07:36  | 06:48      | 06:05   | 05:39     | 05:45     |
|                                   | 20:27 |         | 19:07 | 18:23 | 17:57 | 17:57 | 18:17 | 18:44  | 19:11      | 19:41   | 20:15     | 20:36     |
| 30                                | 06:18 |         | 07:20 | 07:50 | 08:15 | 08:27 | 08:13 | 07:35  | 06:46      | 06:03   | 05:39     | 05:46     |
|                                   | 20:26 |         | 19:06 | 18:22 | 17:56 | 17:57 | 18:17 | 18:44  | 19:12      | 19:42   | 20:16     | 20:36     |
| 31                                | 06:19 |         | 07:21 |       | 08:16 |       | 08:12 | 07:33  |            | 06:02   |           | 05:46     |
|                                   | 20:25 |         | 19:04 |       | 17:56 |       | 18:18 | 18:45  |            | 19:43   |           | 20:36     |
| Horas de sol potenciales          | 450   | 380     | 383   | 333   | 311   | 285   | 302   | 330    | 355        | 406     | 426       | 459       |
| Suma de los minutos con centelleo | 0     | 0       | 0     | 0     | 0     | 0     | 0     | 0      | 0          | 0       | 0         | 0         |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 13 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (657)  
**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>19:50 | 06:52<br>19:50 | 07:22<br>19:02 | 07:50<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>19:49 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:17<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:30<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>19:47 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>19:46 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:58<br>19:47 | 05:38<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>19:44 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:16 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:52<br>20:37 | 06:26<br>19:43 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>19:41 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:26<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>19:40 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:36 | 06:29<br>19:38 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:24 |
| 10                                | 05:55<br>20:36 | 06:30<br>19:37 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>19:35 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:00<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>19:34 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:56 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>19:32 | 07:04<br>19:32 | 07:34<br>18:45 | 08:01<br>18:08 | 08:24<br>17:53 | 08:24<br>18:04 | 07:58<br>18:30 | 07:13<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>19:30 | 07:05<br>19:30 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:57 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:01<br>20:35 | 06:36<br>19:29 | 07:06<br>19:29 | 07:35<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>19:27 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>19:26 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:30 |
| 18                                | 06:04<br>20:34 | 06:40<br>19:24 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:54 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>19:23 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>19:21 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>19:20 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:26<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>19:18 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:19<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:16 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 | 05:42<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:11<br>20:30 | 06:46<br>19:15 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:13 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:12 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:16<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:10 | 07:18<br>19:10 | 07:47<br>18:25 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:09 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:26 | 06:51<br>19:07 | 07:19<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:27<br>17:57 | 08:14<br>18:17 | 07:36<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:18<br>20:26 | 06:51<br>19:06 | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:39<br>20:16 | 05:45<br>20:36 |
| 31                                | 06:19<br>20:25 | 06:51<br>19:04 | 07:21<br>19:04 | 07:51<br>18:21 | 08:16<br>17:56 | 08:27<br>17:57 | 08:12<br>18:18 | 07:33<br>18:45 | 06:45<br>19:13 | 06:02<br>19:43 | 05:39<br>20:17 | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo



## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 14 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (673)  
**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

- Hace sol todo el día, desde la salida hasta la puesta del sol
- El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol
- El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |                |     |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:02 | 07:50<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |                |     |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:17<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:30<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |                |     |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |                |     |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:58<br>19:47 | 05:38<br>20:20 |                |     |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:16 | 05:56<br>19:49 | 05:37<br>20:21 |                |     |
| 6                                 | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |                |     |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:26<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |                |     |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |                |     |
| 9                                 | 05:54<br>20:36 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:24 |                |     |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |                |     |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:00<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |                |     |
| 12                                | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:56 | 05:37<br>20:27 |                |     |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:45 | 08:01<br>18:08 | 08:24<br>17:53 | 08:24<br>18:04 | 07:58<br>18:30 | 07:13<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |                |     |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:30 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:57 | 06:25<br>19:25 | 06:43-06:44/1  | 05:48<br>19:59 | 05:38<br>20:28 |     |
| 15                                | 06:01<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:35<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 06:41-06:45/4  | 05:47<br>20:00 | 05:38<br>20:29 |     |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 06:40-06:47/7  | 05:46<br>20:01 | 05:38<br>20:30 |     |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 06:39-06:48/9  | 05:45<br>20:02 | 05:39<br>20:30 |     |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:54 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 06:40-06:48/8  | 05:45<br>20:03 | 05:39<br>20:31 |     |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 06:42-06:48/6  | 05:44<br>20:04 | 05:39<br>20:32 |     |
| 20                                | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 06:44-06:48/4  | 05:43<br>20:05 | 05:40<br>20:32 |     |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:26<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 06:45-06:47/2  | 05:43<br>20:06 | 05:40<br>20:33 |     |
| 22                                | 06:08<br>20:31 | 06:44<br>20:00 | 07:12<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:19<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 |                | 05:42<br>20:08 | 05:41<br>20:33 |     |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:10<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 |                | 05:42<br>20:09 | 05:41<br>20:34 |     |
| 24                                | 06:11<br>20:30 | 06:46<br>19:57 | 07:08<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:35 |                | 05:41<br>20:10 | 05:42<br>20:34 |     |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:07<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 |                | 05:40<br>20:11 | 05:42<br>20:35 |     |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:08<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:16<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 |                | 05:40<br>20:12 | 05:43<br>20:35 |     |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:09<br>19:10 | 07:47<br>18:25 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 |                | 05:40<br>20:13 | 05:43<br>20:35 |     |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:10<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 |                | 05:39<br>20:14 | 05:44<br>20:36 |     |
| 29                                | 06:16<br>20:26 |                | 07:11<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:27<br>17:57 | 08:14<br>18:17 | 07:36<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 |                | 05:39<br>20:15 | 05:45<br>20:36 |     |
| 30                                | 06:18<br>20:26 |                | 07:12<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 |                | 05:39<br>20:16 | 05:45<br>20:36 |     |
| 31                                | 06:19<br>20:25 |                | 07:13<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:33<br>18:45 |                | 06:02<br>19:43 |                |                | 05:46<br>20:36 |     |
| Horas de sol potenciales          |                |                |                |                |                |                |                |                |                |                |                |                |                |     |
| Suma de los minutos con centelleo |                |                |                |                |                |                |                |                |                |                |                |                |                |     |
|                                   | 450            | 380            | 41             | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 41             | 426            | 459 |

### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

| Día del mes | Salida del sol (hh:mm) | Puesta de sol (hh:mm) | Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo | Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo |
|-------------|------------------------|-----------------------|--|--|
|-------------|------------------------|-----------------------|--|--|

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 15 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (678)  
**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|  | Enero          | Febrero        | Marzo                   | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre               | Diciembre               |
|--|----------------|----------------|-------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------------------|-------------------------|
| 1  | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50          | 07:22<br>19:03 | 07:51<br>18:21 | 08:17<br>17:56 | 08:28<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44          | 06:22-06:32/10<br>20:17 |
| 2  | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49          | 07:23<br>19:01 | 07:52<br>18:20 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:31<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45          | 06:25-06:30/5<br>20:18  |
| 3  | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47          | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46          | 05:38<br>20:19          |
| 4  | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46          | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:28<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48          | 05:38<br>20:20          |
| 5  | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44          | 07:26<br>18:56 | 07:54<br>18:16 | 08:20<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:17 | 05:57<br>19:49          | 05:37<br>20:21          |
| 6  | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43          | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 06:37<br>19:18 | 05:55<br>19:50          | 05:37<br>20:22          |
| 7  | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41          | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:01 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51          | 05:37<br>20:23          |
| 8  | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40          | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52          | 05:37<br>20:24          |
| 9  | 05:54<br>20:37 | 06:29<br>20:16 | 06:55-07:01/6<br>19:38  | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:33<br>19:20 | 05:52<br>19:53          | 05:37<br>20:25          |
| 10   | 05:55<br>20:36 | 06:30<br>20:15 | 06:53-07:04/11<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54          | 05:37<br>20:25          |
| 11   | 05:56<br>20:36 | 06:32<br>20:14 | 06:52-07:05/13<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:01<br>18:28 | 07:17<br>18:55 | 06:30<br>19:22 | 05:50<br>19:55          | 05:37<br>20:26          |
| 12   | 05:57<br>20:36 | 06:33<br>20:13 | 06:53-07:05/12<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:57          | 05:37<br>20:27          |
| 13   | 05:58<br>20:36 | 06:34<br>20:11 | 06:54-07:06/12<br>19:32 | 07:34<br>18:45 | 08:02<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:30 | 07:14<br>18:57 | 06:27<br>19:24 | 05:49<br>19:58          | 05:38<br>20:28          |
| 14   | 05:59<br>20:35 | 06:35<br>20:10 | 06:55-07:06/11<br>19:31 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:58 | 06:25<br>19:25 | 05:48<br>19:59          | 05:38<br>20:29          |
| 15   | 06:01<br>20:35 | 06:36<br>20:09 | 06:56-07:06/10<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00          | 05:38<br>20:29          |
| 16   | 06:02<br>20:35 | 06:37<br>20:08 | 06:58-07:07/9<br>19:27  | 07:37<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01          | 05:38<br>20:30          |
| 17   | 06:03<br>20:34 | 06:39<br>20:06 | 06:59-07:06/7<br>19:26  | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02          | 05:39<br>20:31          |
| 18   | 06:04<br>20:34 | 06:40<br>20:05 | 07:00-07:05/5<br>19:24  | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:54 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03          | 05:39<br>20:31          |
| 19   | 06:05<br>20:33 | 06:41<br>20:04 | 07:01-07:04/3<br>19:23  | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:22<br>18:09 | 07:51<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04          | 05:39<br>20:32          |
| 20   | 06:06<br>20:33 | 06:42<br>20:03 | 07:11<br>19:21          | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:06          | 05:40<br>20:32          |
| 21   | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20          | 07:41<br>18:33 | 08:09<br>18:02 | 08:27<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07          | 05:40<br>20:33          |
| 22   | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18          | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:20<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:34 | 06:32-06:33/1<br>20:08  | 05:42<br>20:33          |
| 23   | 06:09<br>20:31 | 06:45<br>19:59 | 07:14<br>19:17          | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:06 | 06:12<br>19:35 | 06:31-06:35/4<br>20:09  | 05:42<br>20:34          |
| 24   | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15          | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 06:29-06:35/6<br>20:10  | 05:41<br>20:34          |
| 25   | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13          | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 06:28-06:36/8<br>20:11  | 05:41<br>20:35          |
| 26   | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12          | 07:46<br>18:27 | 08:13<br>17:58 | 08:27<br>17:55 | 08:17<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 06:27-06:36/9<br>20:12  | 05:40<br>20:35          |
| 27   | 06:14<br>20:28 | 06:50<br>19:53 | 07:18<br>19:10          | 07:47<br>18:26 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 06:26-06:36/10<br>20:13 | 05:40<br>20:35          |
| 28   | 06:15<br>20:27 | 06:51<br>19:52 | 07:19<br>19:09          | 07:48<br>18:24 | 08:14<br>17:57 | 08:28<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 06:25-06:36/11<br>20:14 | 05:39<br>20:36          |
| 29   | 06:16<br>20:27 |                | 07:20<br>19:07          | 07:49<br>18:23 | 08:15<br>17:57 | 08:28<br>17:57 | 08:14<br>18:17 | 07:37<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 06:23-06:35/12<br>20:15 | 05:39<br>20:36          |
| 30   | 06:18<br>20:26 |                | 07:21<br>19:06          | 07:50<br>18:22 | 08:16<br>17:56 | 08:28<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:47<br>19:12 | 06:03<br>19:42 | 06:22-06:35/13<br>20:16 | 05:39<br>20:36          |
| 31   | 06:19<br>20:25 |                | 07:21<br>19:04          |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:34<br>18:45 |                | 06:02<br>19:43 | 06:21-06:34/13<br>20:16 | 05:46<br>20:36          |
| Horas de sol potenciales   450   380   383   333   311   285   302   330   355   406   426   459 |                |                |                         |                |                |                |                |                |                |                |                         |                         |
| Suma de los minutos con centelleo   0   99   0   0   0   0   0   0   0   87   15   0             |                |                |                         |                |                |                |                |                |                |                |                         |                         |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo



## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 17 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (676)

### Suposiciones para cálculo de la sombra

- Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
 Hace sol todo el día, desde la salida hasta la puesta del sol  
 El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
 El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:02 | 07:50<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:30<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48 | 05:38<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:16 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:24 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:00<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:56 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:44 | 08:01<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:30 | 07:13<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:30 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:57 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:00<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:35<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:30 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:53 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:26<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:19<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 | 05:42<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:16<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:25 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:27 |                | 07:19<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:27<br>17:56 | 08:14<br>18:17 | 07:36<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:18<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:38<br>20:16 | 05:45<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:33<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

|             |                        |  |
|-------------|------------------------|--|
| Día del mes | Salida del sol (hh:mm) | Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo |
|             | Puesta de sol (hh:mm)  | Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo |

### SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 18 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (668)  
**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:02 | 07:50<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:17<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:30<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:58<br>19:47 | 05:38<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:16 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:50 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:26<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:36 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:24 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:00<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:56 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:44 | 08:01<br>18:08 | 08:24<br>17:53 | 08:24<br>18:04 | 07:58<br>18:29 | 07:13<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:30 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:57 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:00<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:35<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:30 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:53 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:26<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:31 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:19<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 | 05:42<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:35 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:16<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:25 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:26 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 30                                | 06:18<br>20:26 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 31                                | 06:19<br>20:25 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

|             |   |  |  |
|-------------|---|--|--|
| Día del mes | Salida del sol (hh:mm)<br>Puesta de sol (hh:mm) | Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo | Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo |
|-------------|---|--|--|

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 19 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (671)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:02 | 07:50<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:17<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:30<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:58<br>19:47 | 05:38<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:16 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:50 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:26<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:35<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:36 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:24 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:00<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:56 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:44 | 08:01<br>18:08 | 08:24<br>17:53 | 08:24<br>18:04 | 07:58<br>18:29 | 07:13<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:30 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:57 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:00<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:35<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:23<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:30 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:53 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:26<br>17:54 | 08:20<br>18:10 | 07:48<br>18:36 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:06 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:31 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:19<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 | 05:41<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:35 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:16<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:25 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:18<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:26 |                | 07:19<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:27<br>17:56 | 08:14<br>18:17 | 07:36<br>18:43 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:18<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:38<br>20:16 | 05:45<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:33<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

### SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 20 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (669)

#### Suposiciones para cálculo de la sombra

- Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:
- Hace sol todo el día, desde la salida hasta la puesta del sol
- El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol
- El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>19:50 | 06:52<br>19:50 | 07:22<br>19:02 | 07:50<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>19:49 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:17<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:30<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>19:47 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>19:46 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:58<br>19:47 | 05:38<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>19:44 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:22 | 07:26<br>18:50 | 06:39<br>19:16 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:51<br>20:37 | 06:26<br>19:43 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:50 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>19:41 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:26<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:35<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>19:40 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:36 | 06:29<br>19:38 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:24 |
| 10                                | 05:55<br>20:36 | 06:30<br>19:37 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>19:35 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:00<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>19:34 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:56 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>19:32 | 07:04<br>19:32 | 07:34<br>18:44 | 08:01<br>18:08 | 08:24<br>17:53 | 08:24<br>18:04 | 07:58<br>18:29 | 07:13<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>19:30 | 07:05<br>19:30 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:57 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:00<br>20:35 | 06:36<br>19:29 | 07:06<br>19:29 | 07:35<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:23<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>19:27 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>19:26 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:30 |
| 18                                | 06:04<br>20:34 | 06:40<br>19:24 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:53 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>19:23 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>19:21 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>19:20 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:26<br>17:54 | 08:20<br>18:10 | 07:48<br>18:36 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:06 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:31 | 06:44<br>19:18 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:19<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:16 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 | 05:41<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:10<br>20:30 | 06:46<br>19:15 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:35 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:13 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:12 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:16<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:10 | 07:18<br>19:10 | 07:47<br>18:25 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:09 | 07:18<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:26 |                | 07:19<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:27<br>17:56 | 08:14<br>18:17 | 07:36<br>18:43 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:17<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:38<br>20:16 | 05:45<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:33<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

|             |                        |   |   |                                  |
|-------------|------------------------|---|---|----------------------------------|
| Día del mes | Salida del sol (hh:mm) | Hora inicial (hh:mm), sombras con centelleo | Hora Final (hh:mm), sombras con centelleo | Minutos con sombras de centelleo |
|             | Puesta de sol (hh: mm) | Hora inicial (hh:mm), sombras con centelleo | Hora Final (hh:mm), sombras con centelleo | Minutos con sombras de centelleo |





## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 22 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (644)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

- Hace sol todo el día, desde la salida hasta la puesta del sol
- El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol
- El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:03 | 07:51<br>18:21 | 08:17<br>17:56 | 08:28<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:52<br>18:20 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:31<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:47 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:28<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48 | 05:38<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:20<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:17 | 05:57<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:25<br>18:51 | 06:37<br>19:18 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:01 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:33<br>19:20 | 05:52<br>19:53 | 05:37<br>20:25 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:01<br>18:28 | 07:17<br>18:55 | 06:30<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:13 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:57 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:45 | 08:02<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:30 | 07:14<br>18:57 | 06:27<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:31 | 07:35<br>18:43 | 08:03<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:58 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:29 |
| 15                                | 06:01<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:37<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:39<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:31 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:54 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:22<br>18:09 | 07:51<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:03 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:06 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:09<br>18:02 | 08:27<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:20<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:34 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:59 | 07:14<br>19:17 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:06 | 06:12<br>19:35 | 05:42<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:41<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:13<br>17:58 | 08:27<br>17:55 | 08:17<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:50<br>19:53 | 07:18<br>19:10 | 07:47<br>18:26 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:52 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:28<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:27 |                | 07:20<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:28<br>17:57 | 08:14<br>18:17 | 07:37<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:18<br>20:26 |                | 07:21<br>19:06 | 07:50<br>18:22 | 08:16<br>17:56 | 08:28<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:47<br>19:12 | 06:03<br>19:42 | 05:39<br>20:16 | 05:46<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:34<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 23 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (648)  
**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

- Hace sol todo el día, desde la salida hasta la puesta del sol
- El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol
- El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo                  | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre              |                        |
|-----------------------------------|----------------|----------------|------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------------|------------------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50         | 07:22<br>19:03 | 07:51<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:20-06:21/1  | 05:38<br>20:17         |                        |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:41-06:47/6<br>19:49 | 06:53<br>19:01 | 07:23<br>18:19 | 07:52<br>17:55 | 08:18<br>17:58 | 08:27<br>18:20 | 08:10<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 06:19-06:21/2<br>20:18 |                        |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:43-06:50/7<br>19:47 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46         | 06:18-06:22/4<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:44-06:51/7<br>19:46 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:28<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48         | 06:17-06:22/5<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:45-06:51/6<br>19:44 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:20<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:17 | 05:56<br>19:49         | 06:16-06:22/6<br>20:21 |
| 6                                 | 05:52<br>20:37 | 06:26<br>20:19 | 06:46-06:52/6<br>19:43 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 06:37<br>19:18 | 05:55<br>19:50         | 06:15-06:21/6<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:47-06:52/5<br>19:41 | 06:58<br>18:53 | 07:28<br>18:14 | 07:56<br>17:54 | 08:21<br>18:00 | 08:27<br>18:24 | 08:05<br>18:51 | 07:23<br>19:18 | 06:36<br>19:51 | 05:54<br>19:52         | 06:14-06:21/7<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:48-06:52/4<br>19:40 | 06:59<br>18:52 | 07:29<br>18:13 | 07:57<br>17:54 | 08:21<br>18:01 | 08:26<br>18:25 | 08:04<br>18:52 | 07:21<br>19:19 | 06:34<br>19:52 | 05:53<br>19:52         | 06:13-06:20/7<br>20:24 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 06:50-06:52/2<br>19:38 | 07:00<br>18:50 | 07:30<br>18:12 | 07:58<br>17:54 | 08:22<br>18:02 | 08:26<br>18:26 | 08:03<br>18:53 | 07:20<br>19:20 | 06:33<br>19:53 | 05:52<br>19:53         | 06:13-06:18/5<br>20:25 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 06:30<br>19:37         | 07:01<br>18:49 | 07:31<br>18:11 | 07:59<br>17:53 | 08:22<br>18:02 | 08:26<br>18:27 | 08:02<br>18:54 | 07:18<br>19:21 | 06:31<br>19:54 | 05:51<br>19:54         | 20:25                  |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35         | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:25<br>18:28 | 08:01<br>18:55 | 07:17<br>19:22 | 06:29<br>19:55 | 05:50<br>19:55         | 20:26                  |
| 12                                | 05:57<br>20:36 | 06:33<br>20:13 | 07:03<br>19:34         | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:57 | 20:27                  |                        |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32         | 07:34<br>18:45 | 08:02<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:30 | 07:14<br>18:57 | 06:27<br>19:24 | 05:49<br>19:58 | 20:28                  |                        |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:31         | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:58 | 06:25<br>19:25 | 05:48<br>19:59 | 20:29                  |                        |
| 15                                | 06:01<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29         | 07:36<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 20:29                  |                        |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27         | 07:37<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 20:30                  |                        |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26         | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 20:31                  |                        |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24         | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:54 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 20:31                  |                        |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23         | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:22<br>18:09 | 07:51<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 20:32                  |                        |
| 20                                | 06:06<br>20:33 | 06:42<br>20:03 | 07:11<br>19:21         | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:06 | 20:32                  |                        |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20         | 07:41<br>18:33 | 08:08<br>18:02 | 08:27<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 20:33                  |                        |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18         | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:20<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 20:33                  |                        |
| 23                                | 06:09<br>20:31 | 06:45<br>19:59 | 07:14<br>19:17         | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:06 | 06:12<br>19:35 | 05:42<br>20:09 | 20:34                  |                        |
| 24                                | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15         | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 20:34                  |                        |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13         | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 20:35                  |                        |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12         | 07:46<br>18:27 | 08:13<br>17:58 | 08:27<br>17:55 | 08:17<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 20:35                  |                        |
| 27                                | 06:14<br>20:28 | 06:50<br>19:53 | 07:18<br>19:10         | 07:47<br>18:26 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 20:35                  |                        |
| 28                                | 06:15<br>20:27 | 06:51<br>19:52 | 07:19<br>19:09         | 07:48<br>18:24 | 08:14<br>17:57 | 08:28<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 20:36                  |                        |
| 29                                | 06:16<br>20:27 |                | 07:20<br>19:07         | 07:49<br>18:23 | 08:15<br>17:57 | 08:28<br>17:57 | 08:14<br>18:17 | 07:37<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 20:36                  |                        |
| 30                                | 06:18<br>20:26 |                | 07:20<br>19:06         | 07:50<br>18:22 | 08:16<br>17:56 | 08:28<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:39<br>20:16 | 20:36                  |                        |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04         |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:34<br>18:45 |                | 06:02<br>19:43 |                | 20:36                  |                        |
| Horas de sol potenciales          | 450            | 380            | 383                    | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459                    |                        |
| Suma de los minutos con centelleo | 0              | 43             | 0                      | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 43             | 0                      |                        |

### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

Día del mes      Salida del sol (hh:mm)      Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm)      Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 24 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (640)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:03 | 07:51<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:31<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:28<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48 | 05:38<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:20<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:17 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:33<br>19:20 | 05:52<br>19:53 | 05:37<br>20:25 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:01<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:13 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:57 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:45 | 08:02<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:30 | 07:14<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:31 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:58 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:01<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:31 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:54 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:03 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:06 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:27<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:20<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:17 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:35 | 05:42<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:17<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:26 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:27 |                | 07:20<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:28<br>17:56 | 08:14<br>18:17 | 07:36<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:18<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:28<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:39<br>20:16 | 05:45<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:34<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 25 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (675)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:03 | 07:51<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:31<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:28<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48 | 05:38<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:17 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:25 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:01<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:57 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:45 | 08:02<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:30 | 07:14<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:31 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:58 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:00<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:30 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:53 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:27<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:20<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 | 05:42<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:17<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:25 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:27 | 06:52<br>19:50 | 07:20<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:27<br>17:56 | 08:14<br>18:17 | 07:36<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:18<br>20:26 | 06:54<br>19:49 | 07:22<br>19:06 | 07:51<br>18:22 | 08:17<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:38<br>20:16 | 05:45<br>20:36 |
| 31                                | 06:19<br>20:25 | 06:55<br>19:48 | 07:23<br>19:04 | 07:52<br>18:21 | 08:18<br>17:56 | 08:27<br>17:58 | 08:12<br>18:18 | 07:34<br>18:45 | 06:47<br>19:13 | 06:04<br>19:43 | 05:39<br>20:17 | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

| Día del mes | Salida del sol (hh:mm) | Puesta de sol (hh:mm) | Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo | Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo |
|-------------|------------------------|-----------------------|--|--|
|-------------|------------------------|-----------------------|--|--|

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 26 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (662)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:02 | 07:51<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:31<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48 | 05:38<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:17 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:25 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:01<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:57 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:45 | 08:02<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:30 | 07:13<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:31 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:57 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:00<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:30 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:53 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:26<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:19<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 | 05:42<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:17<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:25 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:27 |                | 07:19<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:27<br>17:56 | 08:14<br>18:17 | 07:36<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:18<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:38<br>20:16 | 05:45<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:34<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 27 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (642)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                                   | Enero                         | Febrero                       | Marzo          | Abril          | Mayo                          | Junio          |
|-----------------------------------|-------------------------------|-------------------------------|----------------|----------------|-------------------------------|----------------|
| 1                                 | 05:47<br>20:37                | 06:20 06:40-06:51/11<br>20:24 | 06:52<br>19:50 | 07:22<br>19:03 | 07:51 08:12-08:28/16<br>18:21 | 08:17<br>17:56 |
| 2                                 | 05:48<br>20:37                | 06:21 06:41-06:51/10<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:52 08:12-08:29/17<br>18:19 | 08:18<br>17:55 |
| 3                                 | 05:49<br>20:37                | 06:22 06:43-06:53/10<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52 08:13-08:29/16<br>18:18 | 08:18<br>17:55 |
| 4                                 | 05:50<br>20:37                | 06:23 06:44-06:53/9<br>20:21  | 06:55<br>19:46 | 07:25<br>18:58 | 07:53 08:14-08:29/15<br>18:17 | 08:19<br>17:55 |
| 5                                 | 05:51<br>20:37                | 06:25 06:45-06:53/8<br>20:20  | 06:56<br>19:44 | 07:26<br>18:56 | 07:54 08:15-08:29/14<br>18:16 | 08:20<br>17:54 |
| 6                                 | 05:52<br>20:37                | 06:26 06:46-06:53/7<br>20:19  | 06:57<br>19:43 | 07:27<br>18:55 | 07:55 08:16-08:29/13<br>18:15 | 08:20<br>17:54 |
| 7                                 | 05:52<br>20:37                | 06:27 06:47-06:52/5<br>20:18  | 06:58<br>19:41 | 07:28<br>18:53 | 07:56 08:17-08:29/12<br>18:14 | 08:21<br>17:54 |
| 8                                 | 05:53<br>20:37                | 06:28 06:48-06:51/3<br>20:17  | 06:59<br>19:40 | 07:29<br>18:52 | 07:57 08:18-08:29/11<br>18:13 | 08:21<br>17:54 |
| 9                                 | 05:54<br>20:37                | 06:29 06:50-06:51/1<br>20:16  | 07:00<br>19:38 | 07:30<br>18:50 | 07:58 08:19-08:28/9<br>18:12  | 08:22<br>17:54 |
| 10                                | 05:55<br>20:36                | 06:30<br>20:15                | 07:01<br>19:37 | 07:31<br>18:49 | 07:59 08:20-08:28/8<br>18:11  | 08:22<br>17:53 |
| 11                                | 05:56<br>20:36                | 06:32<br>20:14                | 07:02<br>19:35 | 07:32<br>18:47 | 08:00 08:21-08:27/6<br>18:10  | 08:23<br>17:53 |
| 12                                | 05:57<br>20:36                | 06:33<br>20:13                | 07:03<br>19:34 | 07:33<br>18:46 | 08:01 08:22-08:26/4<br>18:09  | 08:23<br>17:53 |
| 13                                | 05:58<br>20:36                | 06:34<br>20:11                | 07:04<br>19:32 | 07:34<br>18:45 | 08:02 08:23-08:24/1<br>18:08  | 08:24<br>17:53 |
| 14                                | 05:59<br>20:35                | 06:35<br>20:10                | 07:05<br>19:31 | 07:35<br>18:43 | 08:03<br>18:07                | 08:24<br>17:53 |
| 15                                | 06:00<br>20:35                | 06:36<br>20:09                | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06                | 08:25<br>17:53 |
| 16                                | 06:02<br>20:35                | 06:37<br>20:08                | 07:07<br>19:27 | 07:37<br>18:40 | 08:04<br>18:05                | 08:25<br>17:53 |
| 17                                | 06:03<br>20:34                | 06:38<br>20:06                | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05                | 08:25<br>17:53 |
| 18                                | 06:04<br>20:34                | 06:40<br>20:05                | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04                | 08:26<br>17:53 |
| 19                                | 06:05<br>20:33                | 06:41<br>20:04                | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03                | 08:26<br>17:54 |
| 20                                | 06:06<br>20:33                | 06:42<br>20:03                | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02                | 08:26<br>17:54 |
| 21                                | 06:07<br>20:32                | 06:43<br>20:01                | 07:12<br>19:20 | 07:41<br>18:33 | 08:09<br>18:02                | 08:27<br>17:54 |
| 22                                | 06:08<br>20:32                | 06:44<br>20:00                | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01                | 08:27<br>17:54 |
| 23                                | 06:09<br>20:31                | 06:45<br>19:59                | 07:14<br>19:17 | 07:43<br>18:31 | 08:10<br>18:00                | 08:27<br>17:54 |
| 24                                | 06:11<br>20:30                | 06:46<br>19:57                | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00                | 08:27<br>17:55 |
| 25                                | 06:12<br>20:30                | 06:47<br>19:56                | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59                | 08:27<br>17:55 |
| 26                                | 06:13<br>20:29                | 06:48<br>19:54                | 07:17<br>19:12 | 07:46<br>18:27 | 08:13<br>17:58                | 08:27<br>17:55 |
| 27                                | 06:14<br>20:28                | 06:50<br>19:53                | 07:18<br>19:10 | 07:47<br>18:26 | 08:13<br>17:58                | 08:27<br>17:56 |
| 28                                | 06:15<br>20:27                | 06:51<br>19:52                | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57                | 08:28<br>17:56 |
| 29                                | 06:16 06:40-06:46/6<br>20:27  |                               | 07:20<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57                | 08:28<br>17:56 |
| 30                                | 06:18 06:38-06:48/10<br>20:26 |                               | 07:20<br>19:06 | 07:50<br>18:22 | 08:16<br>17:56                | 08:28<br>17:57 |
| 31                                | 06:19 06:39-06:50/11<br>20:25 |                               | 07:21<br>19:04 |                | 08:16<br>17:56                |                |
| Horas de sol potenciales          | 450                           | 380                           | 383            | 333            | 311                           | 285            |
| Suma de los minutos con centelleo | 27                            | 64                            | 0              | 33             | 142                           | 0              |

**Diseño de tabla:** Por cada día del mes se aplicará la siguiente matriz

|             |                        |  |
|-------------|------------------------|--|
| Día del mes | Salida del sol (hh:mm) | Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo |
|             | Puesta de sol (hh:mm)  | Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo |

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 27 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (642)  
**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                                   | Julio                        | Agosto                        | Septiembre     | Octubre        | Noviembre                     | Diciembre      |
|-----------------------------------|------------------------------|-------------------------------|----------------|----------------|-------------------------------|----------------|
| 1                                 | 08:28<br>17:57               | 08:11 08:32-08:36/4<br>18:19  | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44                | 05:38<br>20:17 |
| 2                                 | 08:27<br>17:58               | 08:10 08:31-08:37/6<br>18:20  | 07:31<br>18:47 | 06:43<br>19:14 | 06:00 06:19-06:21/2<br>19:45  | 05:38<br>20:18 |
| 3                                 | 08:27<br>17:58               | 08:09 08:30-08:38/8<br>18:21  | 07:29<br>18:48 | 06:42<br>19:15 | 05:59 06:18-06:22/4<br>19:47  | 05:38<br>20:19 |
| 4                                 | 08:27<br>17:59               | 08:08 08:28-08:38/10<br>18:22 | 07:28<br>18:49 | 06:40<br>19:16 | 05:58 06:17-06:22/5<br>19:48  | 05:38<br>20:20 |
| 5                                 | 08:27<br>17:59               | 08:07 08:27-08:38/11<br>18:23 | 07:26<br>18:50 | 06:39<br>19:17 | 05:56 06:16-06:23/7<br>19:49  | 05:37<br>20:21 |
| 6                                 | 08:27<br>18:00               | 08:06 08:26-08:38/12<br>18:23 | 07:24<br>18:51 | 06:37<br>19:18 | 05:55 06:15-06:23/8<br>19:50  | 05:37<br>20:22 |
| 7                                 | 08:27<br>18:00               | 08:05 08:25-08:39/14<br>18:24 | 07:23<br>18:52 | 06:36<br>19:19 | 05:54 06:14-06:23/9<br>19:51  | 05:37<br>20:23 |
| 8                                 | 08:26<br>18:01               | 08:04 08:24-08:39/15<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53 06:13-06:23/10<br>19:52 | 05:37<br>20:24 |
| 9                                 | 08:26<br>18:02               | 08:03 08:23-08:39/16<br>18:26 | 07:20<br>18:53 | 06:33<br>19:20 | 05:52 06:12-06:22/10<br>19:53 | 05:37<br>20:25 |
| 10                                | 08:26<br>18:02               | 08:02 08:22-08:38/16<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51 06:11-06:22/11<br>19:54 | 05:37<br>20:25 |
| 11                                | 08:25<br>18:03               | 08:01 08:20-08:37/17<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50 06:10-06:21/11<br>19:55 | 05:37<br>20:26 |
| 12                                | 08:25<br>18:04               | 07:59 08:20-08:36/16<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50 06:10-06:19/9<br>19:57  | 05:37<br>20:27 |
| 13                                | 08:25<br>18:04               | 07:58 08:21-08:35/14<br>18:30 | 07:14<br>18:57 | 06:27<br>19:24 | 05:49 06:13-06:18/5<br>19:58  | 05:38<br>20:28 |
| 14                                | 08:24<br>18:05               | 07:57 08:23-08:34/11<br>18:30 | 07:12<br>18:58 | 06:25<br>19:25 | 05:48<br>19:59                | 05:38<br>20:29 |
| 15                                | 08:24<br>18:06               | 07:56 08:25-08:30/5<br>18:31  | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00                | 05:38<br>20:29 |
| 16                                | 08:23<br>18:06               | 07:54<br>18:32                | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01                | 05:38<br>20:30 |
| 17                                | 08:23<br>18:07               | 07:53<br>18:33                | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02                | 05:39<br>20:31 |
| 18                                | 08:22<br>18:08               | 07:52<br>18:34                | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03                | 05:39<br>20:31 |
| 19                                | 08:22<br>18:09               | 07:51<br>18:35                | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04                | 05:39<br>20:32 |
| 20                                | 08:21<br>18:09               | 07:49<br>18:36                | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:06                | 05:40<br>20:32 |
| 21                                | 08:20<br>18:10               | 07:48<br>18:37                | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07                | 05:40<br>20:33 |
| 22                                | 08:20<br>18:11               | 07:46<br>18:37                | 06:59<br>19:05 | 06:14<br>19:34 | 05:42<br>20:08                | 05:41<br>20:33 |
| 23                                | 08:19<br>18:12               | 07:45<br>18:38                | 06:58<br>19:06 | 06:12<br>19:35 | 05:42<br>20:09                | 05:41<br>20:34 |
| 24                                | 08:18<br>18:12               | 07:44<br>18:39                | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10                | 05:42<br>20:34 |
| 25                                | 08:17<br>18:13               | 07:42<br>18:40                | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11                | 05:42<br>20:35 |
| 26                                | 08:17<br>18:14               | 07:41<br>18:41                | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12                | 05:43<br>20:35 |
| 27                                | 08:16<br>18:15               | 07:39<br>18:42                | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13                | 05:43<br>20:35 |
| 28                                | 08:15<br>18:16               | 07:38<br>18:43                | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14                | 05:44<br>20:36 |
| 29                                | 08:14<br>18:17               | 07:37<br>18:44                | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15                | 05:45<br>20:36 |
| 30                                | 08:13<br>18:17               | 07:35<br>18:44                | 06:46<br>19:12 | 06:03<br>19:42 | 05:38<br>20:16                | 05:45<br>20:36 |
| 31                                | 08:12 08:33-08:35/2<br>18:18 | 07:34<br>18:45                |                | 06:02<br>19:43 |                               | 05:46<br>20:36 |
| Horas de sol potenciales          | 302                          | 330                           | 355            | 406            | 426                           | 459            |
| Suma de los minutos con centelleo | 2                            | 175                           | 0              | 0              | 91                            | 0              |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

|             |                        |  |
|-------------|------------------------|--|
| Día del mes | Salida del sol (hh:mm) | Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo |
|             | Puesta de sol (hh:mm)  | Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo |

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 28 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (645)  
**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero | Febrero             | Marzo | Abril | Mayo                 | Junio | Julio               | Agosto               | Septiembre | Octubre             | Noviembre | Diciembre |
|-----------------------------------|-------|---------------------|-------|-------|----------------------|-------|---------------------|----------------------|------------|---------------------|-----------|-----------|
| 1                                 | 05:47 | 06:20               | 06:52 | 07:22 | 07:51                | 08:17 | 08:28               | 08:11 08:32-08:40/8  | 07:32      | 06:45               | 06:01     | 05:38     |
| 2                                 | 05:48 | 06:21               | 06:53 | 07:23 | 07:52                | 08:18 | 08:27               | 08:10 08:31-08:40/9  | 07:31      | 06:43               | 06:00     | 05:38     |
| 3                                 | 05:49 | 06:22               | 06:54 | 07:24 | 07:52                | 08:18 | 08:27               | 08:09 08:30-08:39/9  | 07:29      | 06:42               | 05:59     | 05:38     |
| 4                                 | 05:50 | 06:23               | 06:55 | 07:25 | 07:53                | 08:19 | 08:27               | 08:08 08:28-08:38/10 | 07:28      | 06:40               | 05:58     | 05:38     |
| 5                                 | 05:51 | 06:25               | 06:56 | 07:26 | 07:54 08:18-08:25/7  | 08:20 | 08:27               | 08:07 08:27-08:38/11 | 07:26      | 06:39               | 05:56     | 05:37     |
| 6                                 | 05:52 | 06:26               | 06:57 | 07:27 | 07:55 08:16-08:27/11 | 08:20 | 08:27               | 08:06 08:26-08:37/11 | 07:24      | 06:37               | 05:55     | 05:37     |
| 7                                 | 05:52 | 06:27               | 06:58 | 07:28 | 07:56 08:17-08:28/11 | 08:21 | 08:27               | 08:05 08:26-08:36/10 | 07:23      | 06:36               | 05:54     | 05:37     |
| 8                                 | 05:53 | 06:28               | 06:59 | 07:29 | 07:57 08:18-08:28/10 | 08:21 | 08:26               | 08:04 08:28-08:34/6  | 07:21      | 06:34               | 05:53     | 05:37     |
| 9                                 | 05:54 | 06:29               | 07:00 | 07:30 | 07:58 08:19-08:29/10 | 08:22 | 08:26               | 08:03                | 07:20      | 06:33               | 05:52     | 05:37     |
| 10                                | 05:55 | 06:30               | 07:01 | 07:31 | 07:59 08:20-08:29/9  | 08:22 | 08:26               | 08:02                | 07:18      | 06:31               | 05:51     | 05:37     |
| 11                                | 05:56 | 06:32               | 07:02 | 07:32 | 08:00 08:21-08:29/8  | 08:23 | 08:25               | 08:01                | 07:17      | 06:29               | 05:50     | 05:37     |
| 12                                | 05:57 | 06:33               | 07:03 | 07:33 | 08:01 08:22-08:29/7  | 08:23 | 08:25               | 07:59                | 07:15      | 06:28               | 05:50     | 05:37     |
| 13                                | 05:58 | 06:34               | 07:04 | 07:34 | 08:02 08:23-08:29/6  | 08:24 | 08:25               | 07:58                | 07:14      | 06:26               | 05:49     | 05:38     |
| 14                                | 05:59 | 06:35               | 07:05 | 07:35 | 08:02 08:23-08:28/5  | 08:24 | 08:24               | 07:57                | 07:12      | 06:25               | 05:48     | 05:38     |
| 15                                | 06:00 | 06:36               | 07:06 | 07:36 | 08:03 08:24-08:27/3  | 08:25 | 08:24               | 07:56                | 07:10      | 06:24 06:41-06:43/2 | 05:47     | 05:38     |
| 16                                | 06:02 | 06:37               | 07:07 | 07:37 | 08:04 08:25-08:27/2  | 08:25 | 08:23               | 07:54                | 07:09      | 06:22 06:40-06:43/3 | 05:46     | 05:38     |
| 17                                | 06:03 | 06:38               | 07:08 | 07:37 | 08:05                | 08:25 | 08:23               | 07:53                | 07:07      | 06:21 06:39-06:44/5 | 05:45     | 05:39     |
| 18                                | 06:04 | 06:40               | 07:09 | 07:38 | 08:06                | 08:26 | 08:22               | 07:52                | 07:06      | 06:19 06:37-06:43/6 | 05:45     | 05:39     |
| 19                                | 06:05 | 06:41               | 07:10 | 07:39 | 08:07                | 08:26 | 08:22               | 07:51                | 07:04      | 06:18 06:36-06:43/7 | 05:44     | 05:39     |
| 20                                | 06:06 | 06:42 07:03-07:08/5 | 07:11 | 07:40 | 08:08                | 08:26 | 08:21               | 07:49                | 07:02      | 06:16 06:35-06:42/7 | 05:43     | 05:40     |
| 21                                | 06:07 | 06:43 07:03-07:10/7 | 07:12 | 07:41 | 08:09                | 08:27 | 08:20               | 07:48                | 07:01      | 06:15 06:33-06:40/7 | 05:43     | 05:40     |
| 22                                | 06:08 | 06:44 07:04-07:11/7 | 07:13 | 07:42 | 08:09                | 08:27 | 08:20               | 07:46                | 06:59      | 06:14 06:35-06:36/1 | 05:42     | 05:41     |
| 23                                | 06:09 | 06:45 07:05-07:11/6 | 07:14 | 07:43 | 08:10                | 08:27 | 08:19               | 07:45                | 06:58      | 06:12               | 05:42     | 05:41     |
| 24                                | 06:11 | 06:46 07:06-07:12/6 | 07:15 | 07:44 | 08:11                | 08:27 | 08:18               | 07:44                | 06:56      | 06:11               | 05:41     | 05:42     |
| 25                                | 06:12 | 06:47 07:07-07:11/4 | 07:16 | 07:45 | 08:12                | 08:27 | 08:17               | 07:42                | 06:54      | 06:10               | 05:40     | 05:42     |
| 26                                | 06:13 | 06:48 07:08-07:11/3 | 07:17 | 07:46 | 08:13                | 08:27 | 08:17               | 07:41                | 06:53      | 06:08               | 05:40     | 05:43     |
| 27                                | 06:14 | 06:49 07:10-07:11/1 | 07:18 | 07:47 | 08:13                | 08:27 | 08:16 08:36-08:37/1 | 07:39                | 06:51      | 06:07               | 05:40     | 05:43     |
| 28                                | 06:15 | 06:51               | 07:19 | 07:48 | 08:14                | 08:28 | 08:15 08:35-08:37/2 | 07:38                | 06:50      | 06:06               | 05:39     | 05:44     |
| 29                                | 06:16 |                     | 07:20 | 07:49 | 08:15                | 08:28 | 08:14 08:35-08:39/4 | 07:37                | 06:48      | 06:05               | 05:39     | 05:45     |
| 30                                | 06:18 |                     | 07:20 | 07:50 | 08:16                | 08:28 | 08:13 08:34-08:39/5 | 07:35                | 06:46      | 06:03               | 05:38     | 05:45     |
| 31                                | 06:19 |                     | 07:21 |       | 08:16                |       | 08:12 08:33-08:39/6 | 07:34                |            | 06:02               |           | 05:46     |
|                                   | 06:25 |                     | 19:04 |       | 17:56                |       | 18:18               | 18:45                |            | 19:43               |           | 20:36     |
|                                   | 06:25 |                     | 19:04 |       | 17:56                |       | 18:18               | 18:45                |            | 19:43               |           | 20:36     |
| Horas de sol potenciales          | 450   | 380                 | 383   | 333   | 311                  | 285   | 302                 | 330                  | 355        | 406                 | 426       | 459       |
| Suma de los minutos con centelleo | 0     | 39                  | 0     | 0     | 89                   | 0     | 18                  | 74                   | 0          | 38                  | 0         | 0         |

### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

| Día del mes | Salida del sol (hh:mm) | Puesta de sol (hh:mm) | Horas de sol potenciales | Horas de sol potenciales | Horas de sol potenciales | Horas de sol potenciales | Horas de sol potenciales | Horas de sol potenciales | Horas de sol potenciales | Horas de sol potenciales | Horas de sol potenciales | Horas de sol potenciales |
|-------------|------------------------|-----------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|-------------|------------------------|-----------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|



## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 29 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (649)  
**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |                |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:03 | 07:51<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |                |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:31<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |                |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |                |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:28<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48 | 05:38<br>20:20 |                |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:20<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:17 | 05:56<br>19:49 | 05:37<br>20:21 |                |
| 6                                 | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |                |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |                |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |                |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:25 |                |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |                |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:01<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |                |
| 12                                | 05:57<br>20:36 | 06:33<br>20:13 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:57 | 05:37<br>20:27 |                |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:45 | 08:02<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:30 | 07:14<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |                |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:31 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:58 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |                |
| 15                                | 06:00<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 08:45-08:46/1  | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 08:44-08:46/2  | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 08:44-08:47/3  | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:31 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:53 | 08:22<br>18:08 | 08:43-08:47/4  | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:28-08:34/6  | 08:26<br>17:54 | 08:42-08:46/4  | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:03 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:29-08:35/6  | 08:26<br>17:54 | 08:42-08:47/5  | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:06 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:30-08:36/6  | 08:27<br>17:54 | 08:41-08:47/6  | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:31-08:37/6  | 08:27<br>17:54 | 08:40-08:46/6  | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:17 | 07:43<br>18:31 | 08:10<br>18:00 | 08:32-08:37/5  | 08:27<br>17:54 | 08:40-08:46/6  | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:35 | 05:42<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:32-08:37/5  | 08:27<br>17:55 | 08:39-08:45/6  | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:33-08:37/4  | 08:27<br>17:55 | 08:38-08:44/6  | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:34-08:37/3  | 08:27<br>17:55 | 08:17<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:25 | 08:13<br>17:58 | 08:35-08:37/2  | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:36-08:38/2  | 08:28<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:27 |                | 07:20<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:36-08:37/1  | 08:28<br>17:56 | 08:14<br>18:17 | 07:36<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:18<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 |                | 08:28<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:38<br>20:16 | 05:45<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                |                | 08:12<br>18:18 | 07:34<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |                |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 50             | 0              | 49             | 0              | 0              | 0              | 0              | 0              |                |

### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

Día del mes    Salida del sol (hh:mm)    Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm)    Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 30 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (653)  
**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:03 | 07:51<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:31<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:28<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48 | 05:38<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:20<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:17 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:52<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:25 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:01<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:13 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:57 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:45 | 08:02<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:30 | 07:14<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:31 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:58 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:00<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:31 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:53 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:03 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:27<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:20<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:35 | 05:41<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:17<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:25 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:27 |                | 07:20<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:28<br>17:56 | 08:14<br>18:17 | 07:36<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:18<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:38<br>20:16 | 05:45<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:34<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

Día del mes Salida del sol (hh:mm) Puesta de sol (hh: mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 31 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (658)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:02 | 07:51<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:31<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48 | 05:38<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:23 | 07:26<br>18:50 | 06:39<br>19:17 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:51<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:51 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:25 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:01<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:57 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:44 | 08:02<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:29 | 07:13<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:30 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:57 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:00<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:30 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:53 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:26<br>17:54 | 08:20<br>18:10 | 07:48<br>18:37 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:20<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 | 05:41<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:11<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:17<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:25 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:27 |                | 07:19<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:27<br>17:56 | 08:14<br>18:17 | 07:36<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:17<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:38<br>20:16 | 05:45<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:34<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 32 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (663)  
**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:02 | 07:50<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:30<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48 | 05:38<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:22 | 07:26<br>18:50 | 06:39<br>19:16 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:51<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:50 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:24 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:00<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:56 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:44 | 08:01<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:29 | 07:13<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:30 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:57 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:00<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:35<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:30 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:53 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:26<br>17:54 | 08:20<br>18:10 | 07:48<br>18:36 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:19<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 | 05:41<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:10<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:16<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:25 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:27 |                | 07:19<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:27<br>17:56 | 08:14<br>18:17 | 07:36<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:17<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:38<br>20:16 | 05:45<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:33<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

| Día del mes | Salida del sol (hh:mm) | Puesta de sol (hh:mm) | Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo |
|-------------|------------------------|-----------------------|--|
|             |                        |                       |  |

**SHADOW - Calendario por AG**

**Cálculo:** Restricciones nuevas 14.07AG: 33 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (674)

**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>19:50 | 06:52<br>19:50 | 07:22<br>19:02 | 07:50<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:17<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:30<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:58<br>19:47 | 05:38<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:22 | 07:26<br>18:50 | 06:39<br>19:16 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:51<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:50 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:26<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:35<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:54 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:24 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:00<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:50<br>19:56 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:44 | 08:01<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:29 | 07:13<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:30 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:57 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:00<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:35<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:23<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:39<br>20:30 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:53 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:26<br>17:54 | 08:20<br>18:10 | 07:48<br>18:36 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:19<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 | 05:41<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:10<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:35 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:16<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:25 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:26 |                | 07:19<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:27<br>17:56 | 08:14<br>18:17 | 07:36<br>18:43 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:17<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:38<br>20:16 | 05:45<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:33<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          |                |                |                |                |                |                |                |                |                |                |                |                |
| Suma de los minutos con centelleo |                |                |                |                |                |                |                |                |                |                |                |                |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

|             |                        |  |
|-------------|------------------------|--|
| Día del mes | Salida del sol (hh:mm) | Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo |
|             | Puesta de sol (hh: mm) | Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo |

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 34 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (643)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio                   |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|-------------------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:03 | 07:51<br>18:21 | 08:17-08:23/6<br>17:56  |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:52<br>18:19 | 08:15-08:25/10<br>17:55 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:13-08:26/13<br>17:55 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:14-08:27/13<br>17:55 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:15-08:28/13<br>17:54 |
| 6                                 | 05:51<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:16-08:28/12<br>17:54 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:17-08:28/11<br>17:54 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:18-08:29/11<br>17:54 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:19-08:29/10<br>17:54 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:20-08:28/8<br>17:53  |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:21-08:28/7<br>17:53  |
| 12                                | 05:57<br>20:36 | 06:33<br>20:13 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:22-08:28/6<br>17:53  |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:45 | 08:02<br>18:08 | 08:23-08:27/4<br>17:53  |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:31 | 07:35<br>18:43 | 08:02<br>18:07 | 08:23-08:25/2<br>17:53  |
| 15                                | 06:00<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53          |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:37<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53          |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53          |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:53          |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54          |
| 20                                | 06:06<br>20:33 | 06:42<br>20:03 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54          |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:09<br>18:02 | 08:27<br>17:54          |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54          |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:17 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54          |
| 24                                | 06:10<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55          |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55          |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:13<br>17:58 | 08:27<br>17:55          |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:25 | 08:13<br>17:58 | 08:27<br>17:56          |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:28<br>17:56          |
| 29                                | 06:16<br>20:27 |                | 07:20<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:28<br>17:56          |
| 30                                | 06:17<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:16<br>17:56 | 08:28<br>17:57          |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                         |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285                     |
| Suma de los minutos con centelleo | 0              | 0              | 32             | 91             | 126            | 0                       |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 34 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (643)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                                   | Julio                        | Agosto                        | Septiembre                    | Octubre                      | Noviembre      | Diciembre      |
|-----------------------------------|------------------------------|-------------------------------|-------------------------------|------------------------------|----------------|----------------|
| 1                                 | 08:28<br>17:57               | 08:11 08:32-08:38/6<br>18:19  | 07:32 07:51-07:58/7<br>18:46  | 06:45 07:03-07:08/5<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 08:27<br>17:58               | 08:10 08:31-08:39/8<br>18:20  | 07:31 07:49-07:58/9<br>18:47  | 06:43 07:01-07:07/6<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 08:27<br>17:58               | 08:09 08:30-08:39/9<br>18:21  | 07:29 07:48-07:58/10<br>18:48 | 06:42 06:59-07:05/6<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 08:27<br>17:59               | 08:08 08:28-08:38/10<br>18:22 | 07:28 07:46-07:57/11<br>18:49 | 06:40 06:58-07:04/6<br>19:16 | 05:58<br>19:48 | 05:38<br>20:20 |
| 5                                 | 08:27<br>17:59               | 08:07 08:27-08:38/11<br>18:23 | 07:26 07:44-07:56/12<br>18:50 | 06:39 06:58-07:01/3<br>19:17 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 08:27<br>18:00               | 08:06 08:26-08:38/12<br>18:23 | 07:24 07:43-07:55/12<br>18:51 | 06:37<br>19:18               | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 08:27<br>18:00               | 08:05 08:25-08:37/12<br>18:24 | 07:23 07:41-07:54/13<br>18:51 | 06:36<br>19:18               | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 08:26<br>18:01               | 08:04 08:24-08:37/13<br>18:25 | 07:21 07:43-07:52/9<br>18:52  | 06:34<br>19:19               | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 08:26<br>18:02               | 08:03 08:23-08:36/13<br>18:26 | 07:20<br>18:53                | 06:32<br>19:20               | 05:52<br>19:53 | 05:37<br>20:25 |
| 10                                | 08:26<br>18:02               | 08:02 08:23-08:35/12<br>18:27 | 07:18<br>18:54                | 06:31<br>19:21               | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 08:25<br>18:03               | 08:01 08:24-08:33/9<br>18:28  | 07:17<br>18:55                | 06:29<br>19:22               | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 08:25<br>18:04               | 07:59 08:27-08:29/2<br>18:29  | 07:15<br>18:56                | 06:28<br>19:23               | 05:50<br>19:57 | 05:37<br>20:27 |
| 13                                | 08:25<br>18:04               | 07:58<br>18:29                | 07:14<br>18:57                | 06:26<br>19:24               | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 08:24<br>18:05               | 07:57<br>18:30                | 07:12<br>18:58                | 06:25<br>19:25               | 05:48<br>19:59 | 05:38<br>20:29 |
| 15                                | 08:24<br>18:06               | 07:56<br>18:31                | 07:10<br>18:58                | 06:24<br>19:26               | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 08:23<br>18:06               | 07:54<br>18:32                | 07:09<br>18:59                | 06:22<br>19:27               | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 08:23<br>18:07               | 07:53<br>18:33                | 07:07<br>19:00                | 06:21<br>19:28               | 05:45<br>20:02 | 05:39<br>20:31 |
| 18                                | 08:22<br>18:08               | 07:52<br>18:34                | 07:06<br>19:01                | 06:19<br>19:29               | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 08:22<br>18:09               | 07:51<br>18:35                | 07:04<br>19:02                | 06:18<br>19:30               | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 08:21<br>18:09               | 07:49<br>18:36                | 07:02<br>19:03                | 06:16<br>19:31               | 05:43<br>20:06 | 05:40<br>20:32 |
| 21                                | 08:20<br>18:10               | 07:48<br>18:37                | 07:01<br>19:04                | 06:15<br>19:32               | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 08:20<br>18:11               | 07:46<br>18:37                | 06:59<br>19:05                | 06:14<br>19:33               | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 08:19<br>18:12               | 07:45<br>18:38                | 06:58<br>19:05                | 06:12<br>19:35               | 05:41<br>20:09 | 05:41<br>20:34 |
| 24                                | 08:18<br>18:12               | 07:44<br>18:39                | 06:56<br>19:06                | 06:11<br>19:36               | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 08:17<br>18:13               | 07:42<br>18:40                | 06:54<br>19:07                | 06:10<br>19:37               | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 08:17<br>18:14               | 07:41<br>18:41                | 06:53<br>19:08                | 06:08<br>19:38               | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 08:16<br>18:15               | 07:39<br>18:42                | 06:51<br>19:09                | 06:07<br>19:39               | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 08:15<br>18:16               | 07:38<br>18:43                | 06:50<br>19:10                | 06:06<br>19:40               | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 08:14 08:35-08:36/1<br>18:17 | 07:37<br>18:44                | 06:48 07:06-07:08/2<br>19:11  | 06:05<br>19:41               | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 08:13 08:34-08:37/3<br>18:17 | 07:35 07:54-07:57/3<br>18:44  | 06:46 07:04-07:08/4<br>19:12  | 06:03<br>19:42               | 05:38<br>20:16 | 05:45<br>20:36 |
| 31                                | 08:12 08:33-08:38/5<br>18:18 | 07:34 07:52-07:57/5<br>18:45  |                               | 06:02<br>19:43               |                | 05:46<br>20:36 |
| Horas de sol potenciales          |                              | 302                           | 355                           | 406                          | 426            | 459            |
| Suma de los minutos con centelleo |                              | 9                             | 125                           | 89                           | 26             | 0              |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

|             |                        |  |  |  |  |
|-------------|------------------------|--|--|--|--|
| Día del mes | Salida del sol (hh:mm) | Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo |  |  |  |
|             | Puesta de sol (hh:mm)  | Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo |  |  |  |





## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 36 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (650)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:02 | 07:51<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:31<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48 | 05:37<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:20<br>17:54 | 08:27<br>17:59 | 08:07<br>18:22 | 07:26<br>18:50 | 06:39<br>19:17 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:51<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:50 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:53 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:25 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:01<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:13 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:49<br>19:57 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:44 | 08:02<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:29 | 07:13<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:30 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:57 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:00<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:24<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:38<br>20:31 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:53 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:09 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:27<br>17:54 | 08:20<br>18:10 | 07:48<br>18:36 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:20<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:41<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 | 05:41<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:10<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:17<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:25 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:27 |                | 07:19<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:28<br>17:56 | 08:14<br>18:17 | 07:36<br>18:44 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:17<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:28<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:38<br>20:16 | 05:45<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:34<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

**Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz**

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 37 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (654)

### Suposiciones para cálculo de la sombra

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:

Hace sol todo el día, desde la salida hasta la puesta del sol

El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol

El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:02 | 07:51<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:31<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:58<br>19:48 | 05:37<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:22 | 07:26<br>18:50 | 06:39<br>19:17 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:51<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:50 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:36<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:53 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:25 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:01<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:49<br>19:57 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:44 | 08:02<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:29 | 07:13<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:30 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:57 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:00<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:36<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:23<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:38<br>20:30 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:53 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:08 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:27<br>17:54 | 08:20<br>18:10 | 07:48<br>18:36 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:20<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:40<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 | 05:41<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:10<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:17<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:25 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:51<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:27 |                | 07:19<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:27<br>17:56 | 08:14<br>18:16 | 07:36<br>18:43 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:17<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:38<br>20:16 | 05:45<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:34<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              | 0              |

Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

Día del mes Salida del sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm) Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

## SHADOW - Calendario por AG

**Cálculo:** Restricciones nuevas 14.07AG: 38 - GAMESA G114 2650 114.0 !O! hub: 93,0 m (TOT: 150,0 m) (659)  
**Suposiciones para cálculo de la sombra**

Los tiempos calculados son para el "caso peor" dado por las suposiciones siguientes:  
Hace sol todo el día, desde la salida hasta la puesta del sol  
El plano del rotor es siempre perpendicular a la línea entre aerogeneradores y el sol  
El AG está siempre en operación

|                                   | Enero          | Febrero        | Marzo          | Abril          | Mayo           | Junio          | Julio          | Agosto         | Septiembre     | Octubre        | Noviembre      | Diciembre      |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1                                 | 05:47<br>20:37 | 06:20<br>20:24 | 06:52<br>19:50 | 07:22<br>19:02 | 07:50<br>18:21 | 08:17<br>17:56 | 08:27<br>17:57 | 08:11<br>18:19 | 07:32<br>18:46 | 06:45<br>19:13 | 06:01<br>19:44 | 05:38<br>20:17 |
| 2                                 | 05:48<br>20:37 | 06:21<br>20:23 | 06:53<br>19:49 | 07:23<br>19:01 | 07:51<br>18:19 | 08:18<br>17:55 | 08:27<br>17:58 | 08:10<br>18:20 | 07:30<br>18:47 | 06:43<br>19:14 | 06:00<br>19:45 | 05:38<br>20:18 |
| 3                                 | 05:49<br>20:37 | 06:22<br>20:22 | 06:54<br>19:47 | 07:24<br>18:59 | 07:52<br>18:18 | 08:18<br>17:55 | 08:27<br>17:58 | 08:09<br>18:21 | 07:29<br>18:48 | 06:42<br>19:15 | 05:59<br>19:46 | 05:38<br>20:19 |
| 4                                 | 05:50<br>20:37 | 06:23<br>20:21 | 06:55<br>19:46 | 07:25<br>18:58 | 07:53<br>18:17 | 08:19<br>17:55 | 08:27<br>17:59 | 08:08<br>18:22 | 07:27<br>18:49 | 06:40<br>19:16 | 05:57<br>19:48 | 05:37<br>20:20 |
| 5                                 | 05:51<br>20:37 | 06:25<br>20:20 | 06:56<br>19:44 | 07:26<br>18:56 | 07:54<br>18:16 | 08:19<br>17:54 | 08:27<br>17:59 | 08:07<br>18:22 | 07:26<br>18:50 | 06:39<br>19:16 | 05:56<br>19:49 | 05:37<br>20:21 |
| 6                                 | 05:51<br>20:37 | 06:26<br>20:19 | 06:57<br>19:43 | 07:27<br>18:55 | 07:55<br>18:15 | 08:20<br>17:54 | 08:27<br>18:00 | 08:06<br>18:23 | 07:24<br>18:50 | 06:37<br>19:17 | 05:55<br>19:50 | 05:37<br>20:22 |
| 7                                 | 05:52<br>20:37 | 06:27<br>20:18 | 06:58<br>19:41 | 07:28<br>18:53 | 07:56<br>18:14 | 08:21<br>17:54 | 08:27<br>18:00 | 08:05<br>18:24 | 07:23<br>18:51 | 06:35<br>19:18 | 05:54<br>19:51 | 05:37<br>20:23 |
| 8                                 | 05:53<br>20:37 | 06:28<br>20:17 | 06:59<br>19:40 | 07:29<br>18:52 | 07:57<br>18:13 | 08:21<br>17:54 | 08:26<br>18:01 | 08:04<br>18:25 | 07:21<br>18:52 | 06:34<br>19:19 | 05:53<br>19:52 | 05:37<br>20:24 |
| 9                                 | 05:54<br>20:37 | 06:29<br>20:16 | 07:00<br>19:38 | 07:30<br>18:50 | 07:58<br>18:12 | 08:22<br>17:53 | 08:26<br>18:02 | 08:03<br>18:26 | 07:20<br>18:53 | 06:32<br>19:20 | 05:52<br>19:53 | 05:37<br>20:25 |
| 10                                | 05:55<br>20:36 | 06:30<br>20:15 | 07:01<br>19:37 | 07:31<br>18:49 | 07:59<br>18:11 | 08:22<br>17:53 | 08:26<br>18:02 | 08:02<br>18:27 | 07:18<br>18:54 | 06:31<br>19:21 | 05:51<br>19:54 | 05:37<br>20:25 |
| 11                                | 05:56<br>20:36 | 06:32<br>20:14 | 07:02<br>19:35 | 07:32<br>18:47 | 08:00<br>18:10 | 08:23<br>17:53 | 08:25<br>18:03 | 08:00<br>18:28 | 07:17<br>18:55 | 06:29<br>19:22 | 05:50<br>19:55 | 05:37<br>20:26 |
| 12                                | 05:57<br>20:36 | 06:33<br>20:12 | 07:03<br>19:34 | 07:33<br>18:46 | 08:01<br>18:09 | 08:23<br>17:53 | 08:25<br>18:04 | 07:59<br>18:29 | 07:15<br>18:56 | 06:28<br>19:23 | 05:49<br>19:57 | 05:37<br>20:27 |
| 13                                | 05:58<br>20:36 | 06:34<br>20:11 | 07:04<br>19:32 | 07:34<br>18:44 | 08:02<br>18:08 | 08:24<br>17:53 | 08:25<br>18:04 | 07:58<br>18:29 | 07:13<br>18:57 | 06:26<br>19:24 | 05:49<br>19:58 | 05:38<br>20:28 |
| 14                                | 05:59<br>20:35 | 06:35<br>20:10 | 07:05<br>19:30 | 07:35<br>18:43 | 08:02<br>18:07 | 08:24<br>17:53 | 08:24<br>18:05 | 07:57<br>18:30 | 07:12<br>18:57 | 06:25<br>19:25 | 05:48<br>19:59 | 05:38<br>20:28 |
| 15                                | 06:00<br>20:35 | 06:36<br>20:09 | 07:06<br>19:29 | 07:35<br>18:42 | 08:03<br>18:06 | 08:25<br>17:53 | 08:24<br>18:06 | 07:56<br>18:31 | 07:10<br>18:58 | 06:23<br>19:26 | 05:47<br>20:00 | 05:38<br>20:29 |
| 16                                | 06:02<br>20:35 | 06:37<br>20:08 | 07:07<br>19:27 | 07:36<br>18:40 | 08:04<br>18:05 | 08:25<br>17:53 | 08:23<br>18:06 | 07:54<br>18:32 | 07:09<br>18:59 | 06:22<br>19:27 | 05:46<br>20:01 | 05:38<br>20:30 |
| 17                                | 06:03<br>20:34 | 06:38<br>20:06 | 07:08<br>19:26 | 07:37<br>18:39 | 08:05<br>18:05 | 08:25<br>17:53 | 08:23<br>18:07 | 07:53<br>18:33 | 07:07<br>19:00 | 06:21<br>19:28 | 05:45<br>20:02 | 05:38<br>20:30 |
| 18                                | 06:04<br>20:34 | 06:40<br>20:05 | 07:09<br>19:24 | 07:38<br>18:37 | 08:06<br>18:04 | 08:26<br>17:53 | 08:22<br>18:08 | 07:52<br>18:34 | 07:06<br>19:01 | 06:19<br>19:29 | 05:45<br>20:03 | 05:39<br>20:31 |
| 19                                | 06:05<br>20:33 | 06:41<br>20:04 | 07:10<br>19:23 | 07:39<br>18:36 | 08:07<br>18:03 | 08:26<br>17:54 | 08:21<br>18:08 | 07:50<br>18:35 | 07:04<br>19:02 | 06:18<br>19:30 | 05:44<br>20:04 | 05:39<br>20:32 |
| 20                                | 06:06<br>20:33 | 06:42<br>20:02 | 07:11<br>19:21 | 07:40<br>18:35 | 08:08<br>18:02 | 08:26<br>17:54 | 08:21<br>18:09 | 07:49<br>18:36 | 07:02<br>19:03 | 06:16<br>19:31 | 05:43<br>20:05 | 05:40<br>20:32 |
| 21                                | 06:07<br>20:32 | 06:43<br>20:01 | 07:12<br>19:20 | 07:41<br>18:33 | 08:08<br>18:02 | 08:26<br>17:54 | 08:20<br>18:10 | 07:48<br>18:36 | 07:01<br>19:04 | 06:15<br>19:32 | 05:43<br>20:07 | 05:40<br>20:33 |
| 22                                | 06:08<br>20:32 | 06:44<br>20:00 | 07:13<br>19:18 | 07:42<br>18:32 | 08:09<br>18:01 | 08:27<br>17:54 | 08:19<br>18:11 | 07:46<br>18:37 | 06:59<br>19:05 | 06:14<br>19:33 | 05:42<br>20:08 | 05:40<br>20:33 |
| 23                                | 06:09<br>20:31 | 06:45<br>19:58 | 07:14<br>19:16 | 07:43<br>18:31 | 08:10<br>18:00 | 08:27<br>17:54 | 08:19<br>18:12 | 07:45<br>18:38 | 06:58<br>19:05 | 06:12<br>19:34 | 05:41<br>20:09 | 05:41<br>20:34 |
| 24                                | 06:10<br>20:30 | 06:46<br>19:57 | 07:15<br>19:15 | 07:44<br>18:29 | 08:11<br>18:00 | 08:27<br>17:55 | 08:18<br>18:12 | 07:44<br>18:39 | 06:56<br>19:06 | 06:11<br>19:36 | 05:41<br>20:10 | 05:42<br>20:34 |
| 25                                | 06:12<br>20:30 | 06:47<br>19:56 | 07:16<br>19:13 | 07:45<br>18:28 | 08:12<br>17:59 | 08:27<br>17:55 | 08:17<br>18:13 | 07:42<br>18:40 | 06:54<br>19:07 | 06:10<br>19:37 | 05:40<br>20:11 | 05:42<br>20:35 |
| 26                                | 06:13<br>20:29 | 06:48<br>19:54 | 07:17<br>19:12 | 07:46<br>18:27 | 08:12<br>17:58 | 08:27<br>17:55 | 08:17<br>18:14 | 07:41<br>18:41 | 06:53<br>19:08 | 06:08<br>19:38 | 05:40<br>20:12 | 05:43<br>20:35 |
| 27                                | 06:14<br>20:28 | 06:49<br>19:53 | 07:18<br>19:10 | 07:47<br>18:25 | 08:13<br>17:58 | 08:27<br>17:56 | 08:16<br>18:15 | 07:39<br>18:42 | 06:51<br>19:09 | 06:07<br>19:39 | 05:40<br>20:13 | 05:43<br>20:35 |
| 28                                | 06:15<br>20:27 | 06:50<br>19:51 | 07:19<br>19:09 | 07:48<br>18:24 | 08:14<br>17:57 | 08:27<br>17:56 | 08:15<br>18:16 | 07:38<br>18:43 | 06:50<br>19:10 | 06:06<br>19:40 | 05:39<br>20:14 | 05:44<br>20:36 |
| 29                                | 06:16<br>20:27 |                | 07:19<br>19:07 | 07:49<br>18:23 | 08:15<br>17:57 | 08:27<br>17:56 | 08:14<br>18:16 | 07:36<br>18:43 | 06:48<br>19:11 | 06:05<br>19:41 | 05:39<br>20:15 | 05:45<br>20:36 |
| 30                                | 06:17<br>20:26 |                | 07:20<br>19:06 | 07:50<br>18:22 | 08:15<br>17:56 | 08:27<br>17:57 | 08:13<br>18:17 | 07:35<br>18:44 | 06:46<br>19:12 | 06:03<br>19:42 | 05:38<br>20:16 | 05:45<br>20:36 |
| 31                                | 06:19<br>20:25 |                | 07:21<br>19:04 |                | 08:16<br>17:56 |                | 08:12<br>18:18 | 07:33<br>18:45 |                | 06:02<br>19:43 |                | 05:46<br>20:36 |
| Horas de sol potenciales          | 450            | 380            | 383            | 333            | 311            | 285            | 302            | 330            | 355            | 406            | 426            | 459            |
| Suma de los minutos con centelleo | 0              | 0              | 21             | 0              | 0              | 0              | 0              | 0              | 0              | 18             | 0              | 0              |

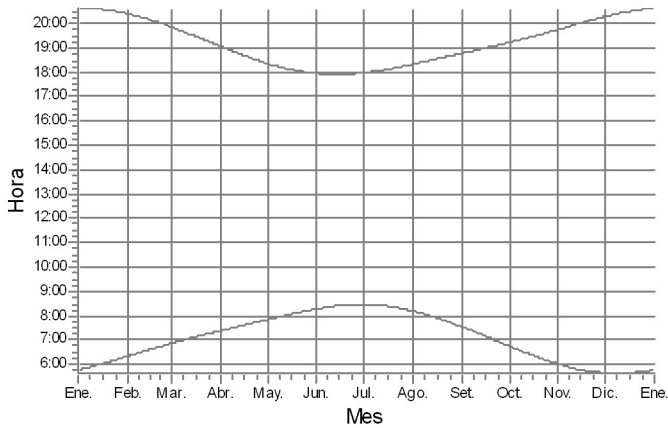
### Diseño de tabla: Por cada día del mes se aplicará la siguiente matriz

Día del mes      Salida del sol (hh:mm)      Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo  
Puesta de sol (hh:mm)      Hora inicial (hh:mm), sombras con centelleo-Hora Final (hh:mm), sombras con centelleo/Minutos con sombras de centelleo

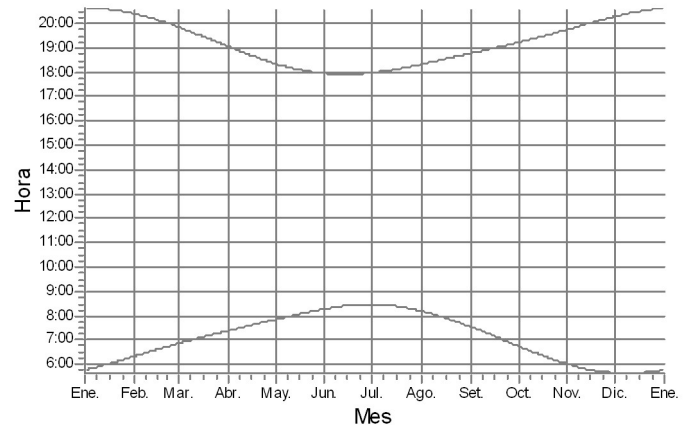
## SHADOW - Calendario por AG, gráfico

**Cálculo:** Restricciones nuevas 14.07

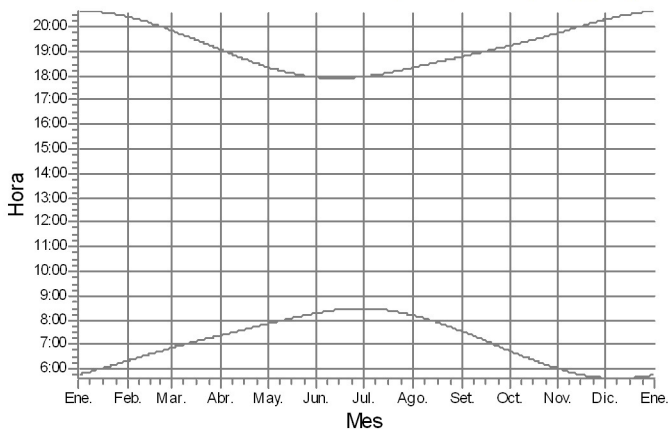
1: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (655)



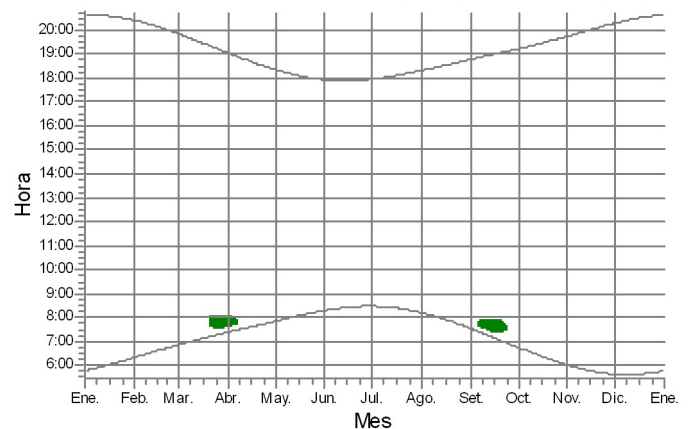
2: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (660)



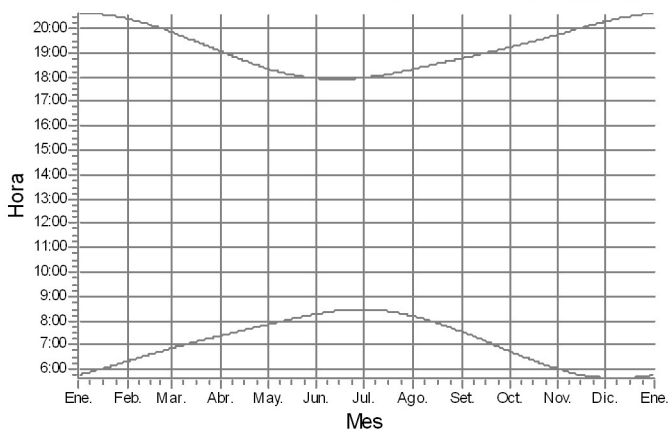
3: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (661)



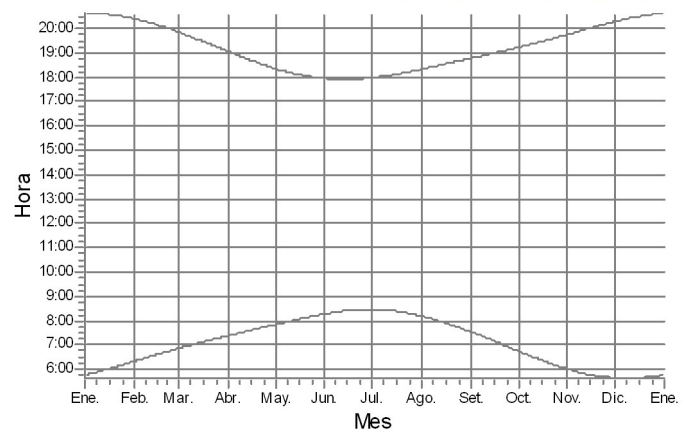
4: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (670)



5: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (656)



6: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (664)



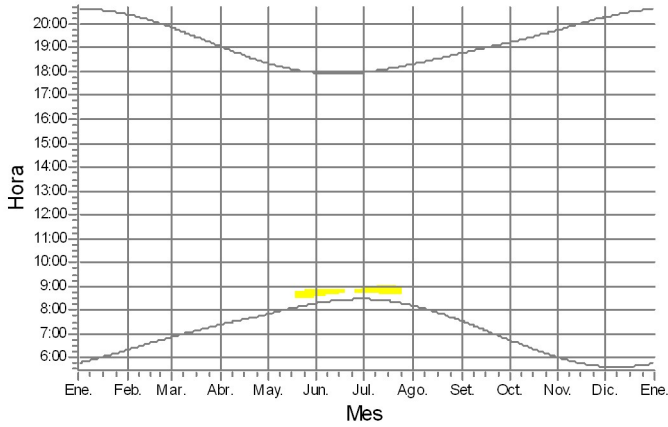
Receptores de sombra

 Punto 1: Punto 1

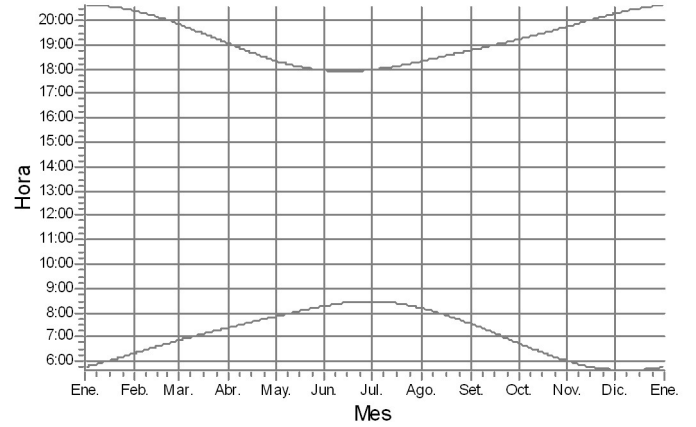
## SHADOW - Calendario por AG, gráfico

**Cálculo:** Restricciones nuevas 14.07

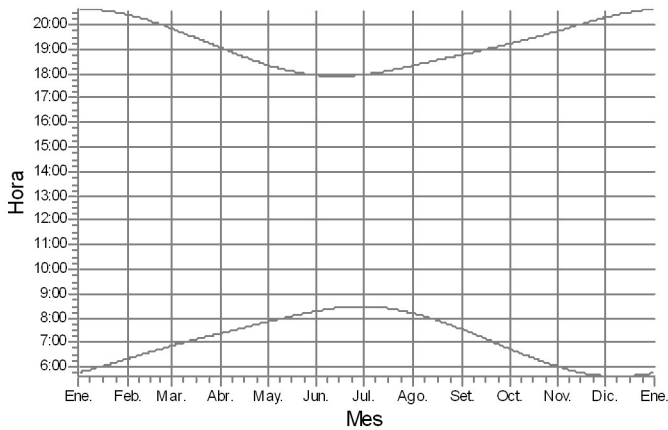
7: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (651)



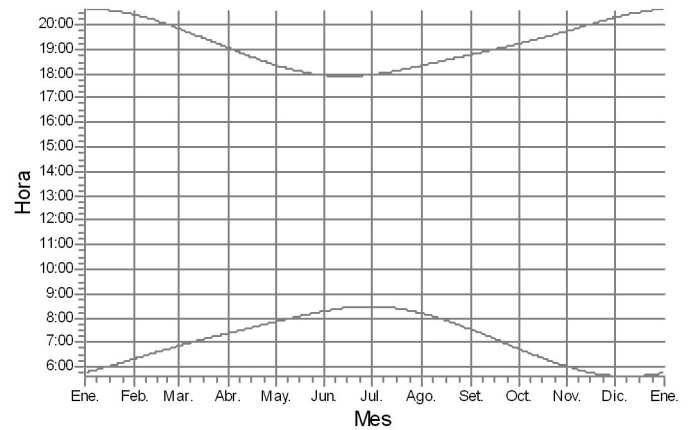
8: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (677)



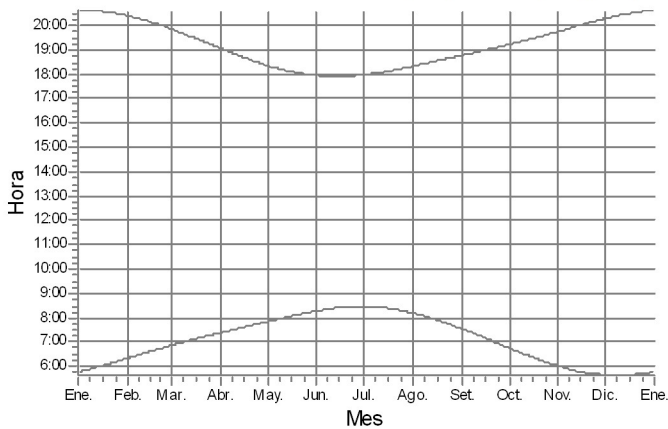
9: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (666)



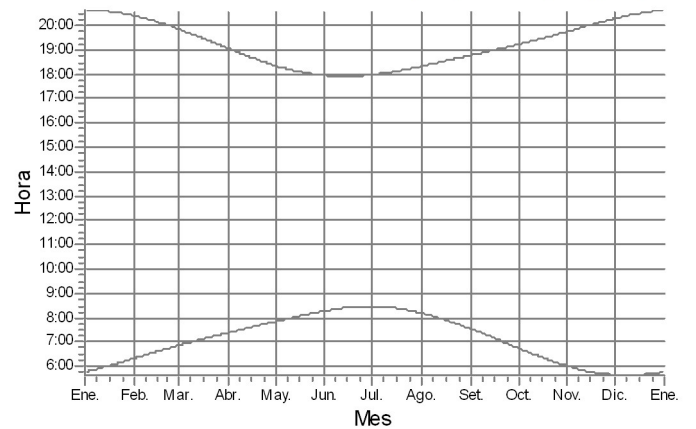
10: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (647)




11: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (666)



12: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (667)



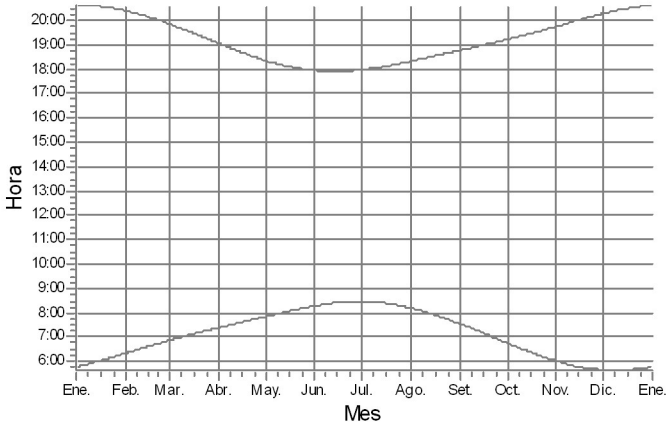
Receptores de sombra

 Punto 2: Punto 2

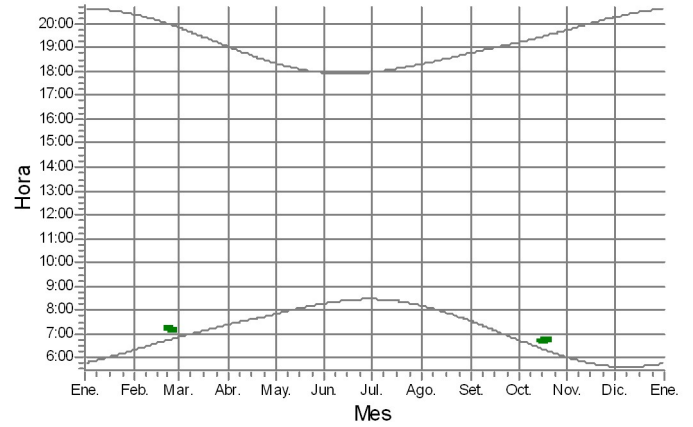
## SHADOW - Calendario por AG, gráfico

**Cálculo:** Restricciones nuevas 14.07

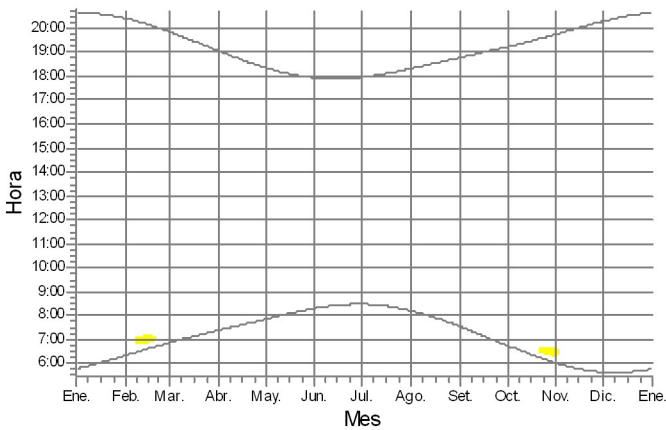
13: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (657)



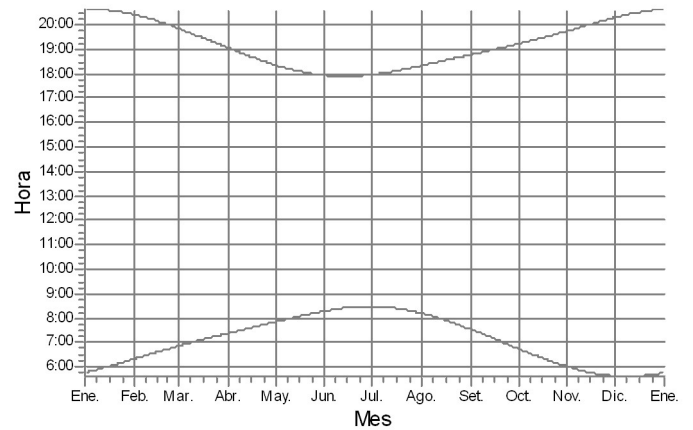
14: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (673)



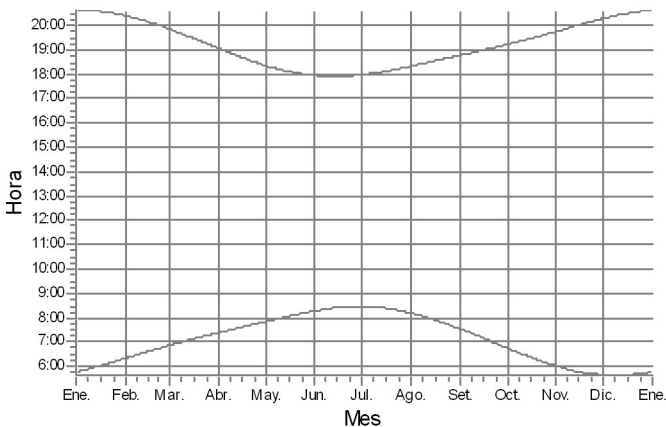
15: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (678)



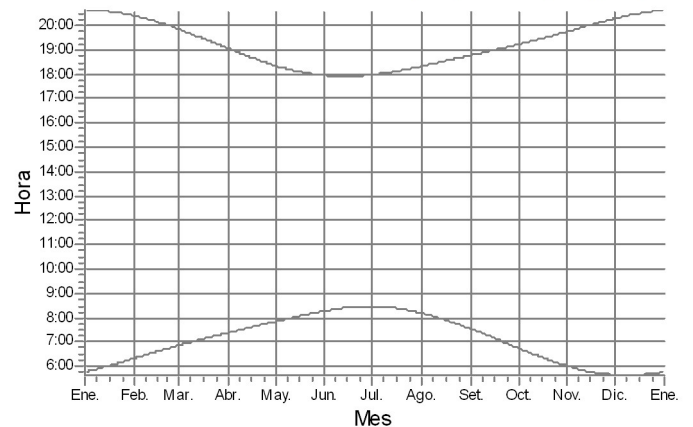
16: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (652)



17: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (676)



18: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (668)



Receptores de sombra

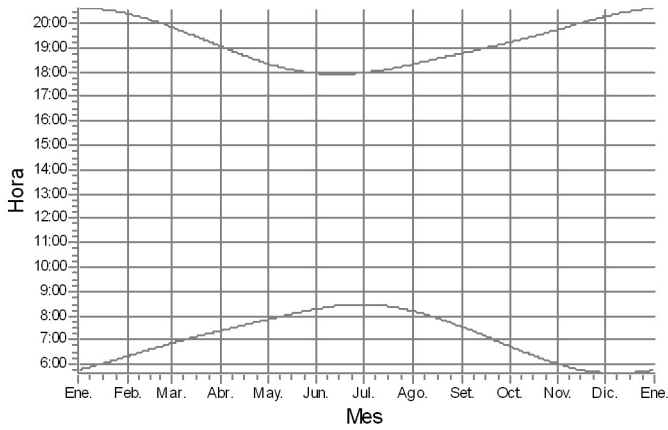
Punto 1: Punto 1

Punto 2: Punto 2

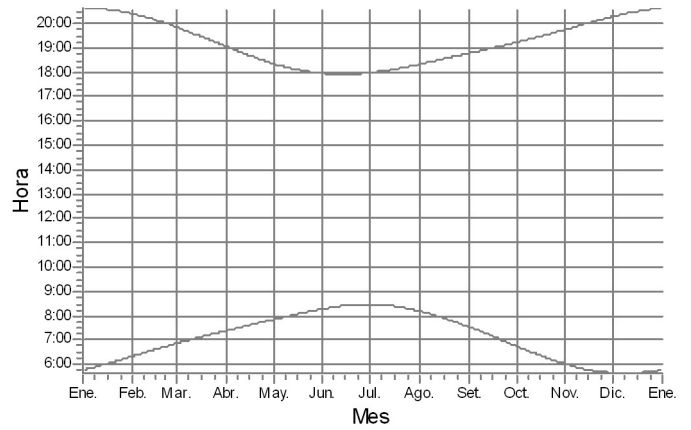
## SHADOW - Calendario por AG, gráfico

**Cálculo:** Restricciones nuevas 14.07

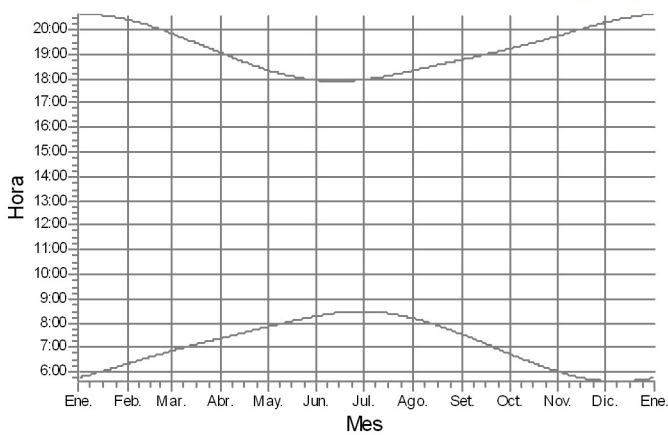
19: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (671)



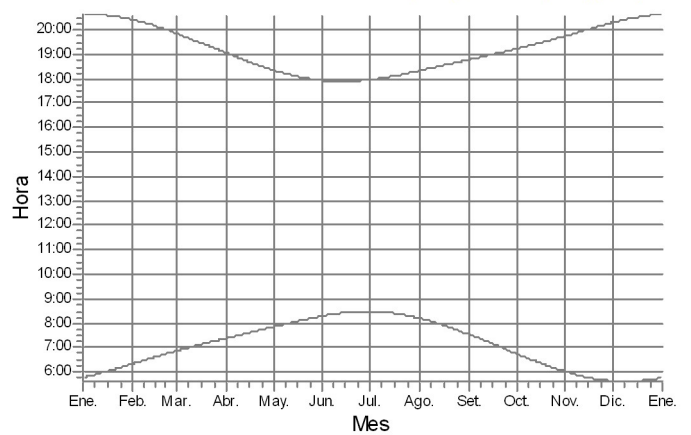
20: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (669)



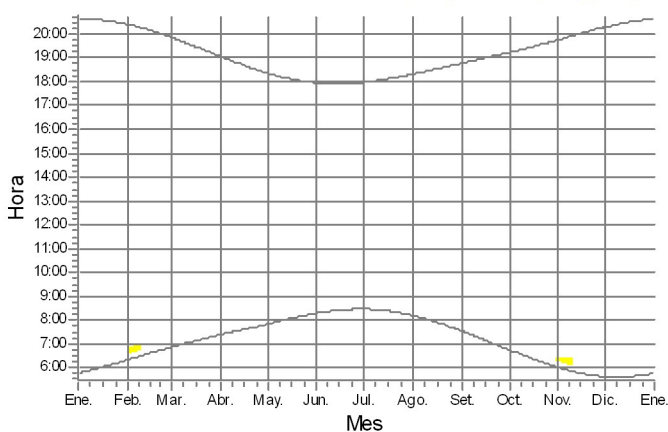
21: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (672)



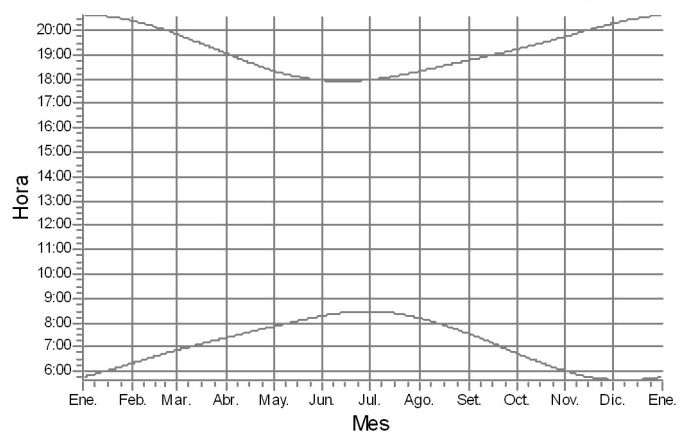
22: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (644)



23: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (648)



24: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (640)



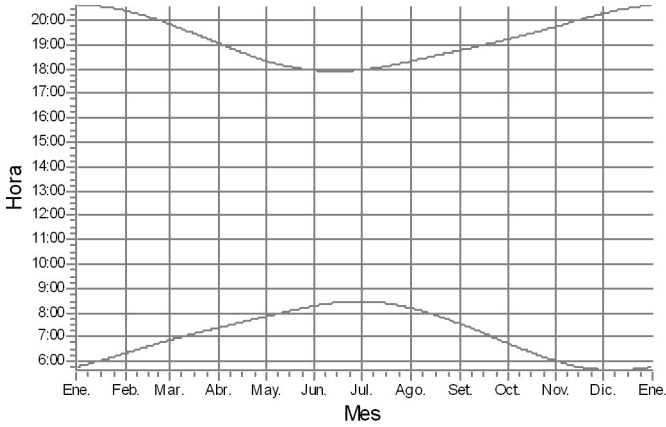
Receptores de sombra

 Punto 2: Punto 2

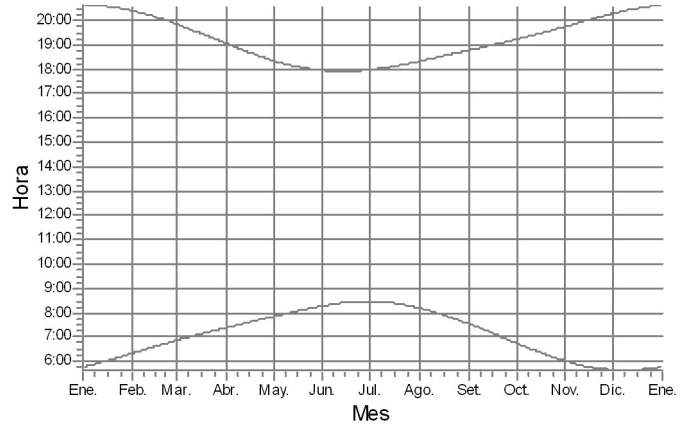
## SHADOW - Calendario por AG, gráfico

**Cálculo:** Restricciones nuevas 14.07

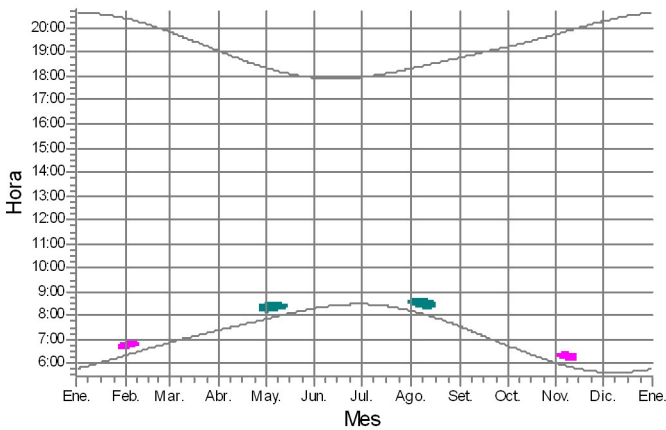
25: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (675)



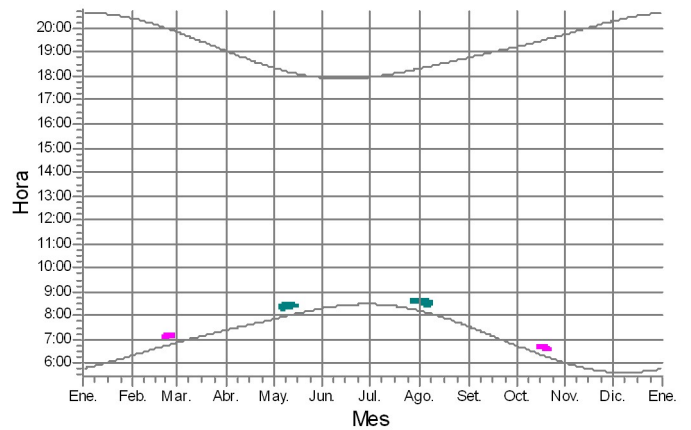
26: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (662)



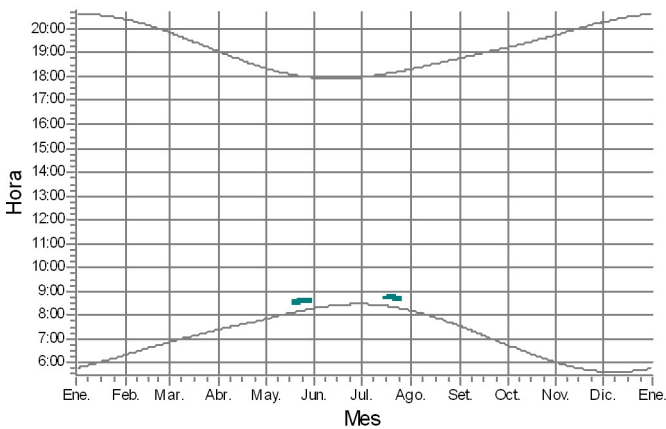
27: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (642)



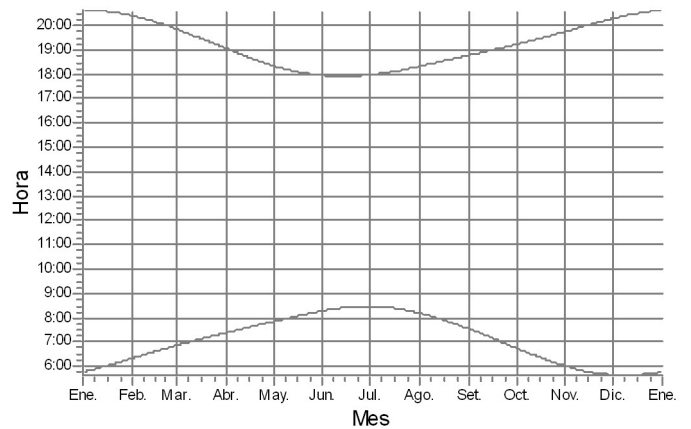
28: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (645)



29: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (649)



30: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (653)



Receptores de sombra



Punto 5: Punto 5



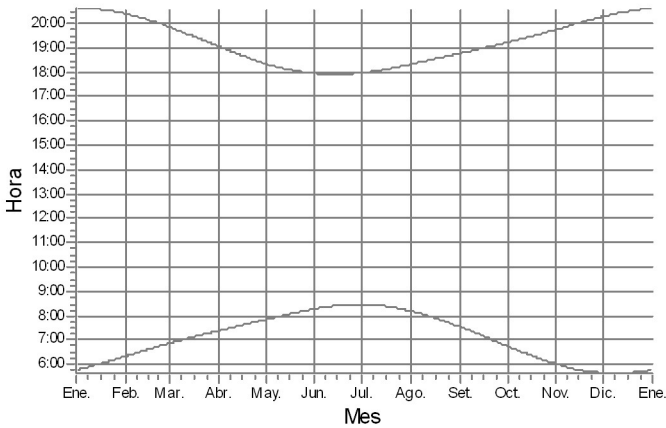
Punto 6: Punto 6



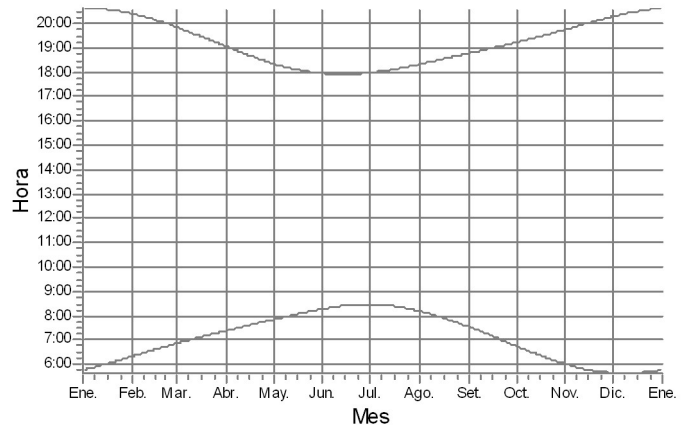
## SHADOW - Calendario por AG, gráfico

**Cálculo:** Restricciones nuevas 14.07

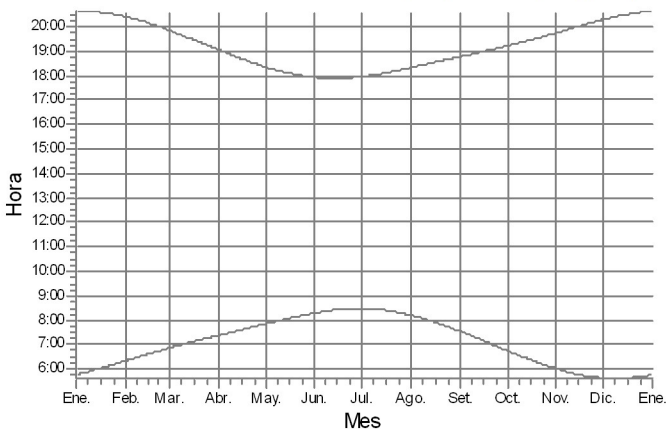
31: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (658)



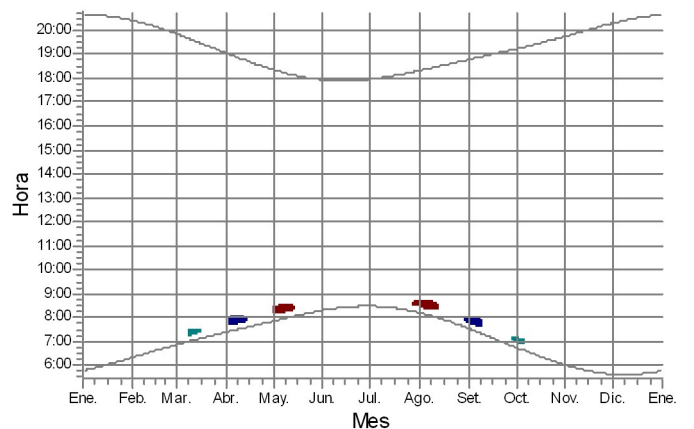
32: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (663)



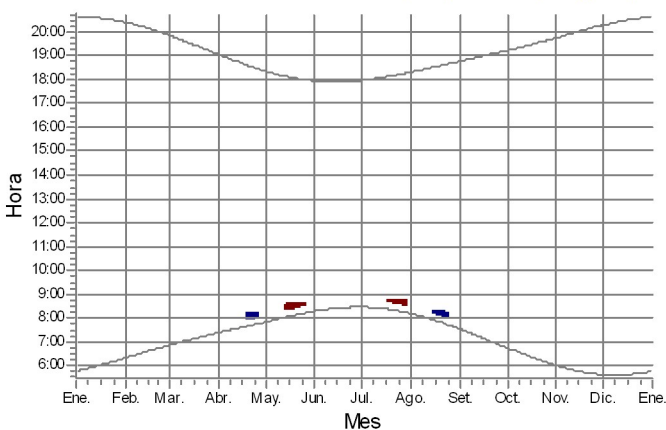
33: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (674)



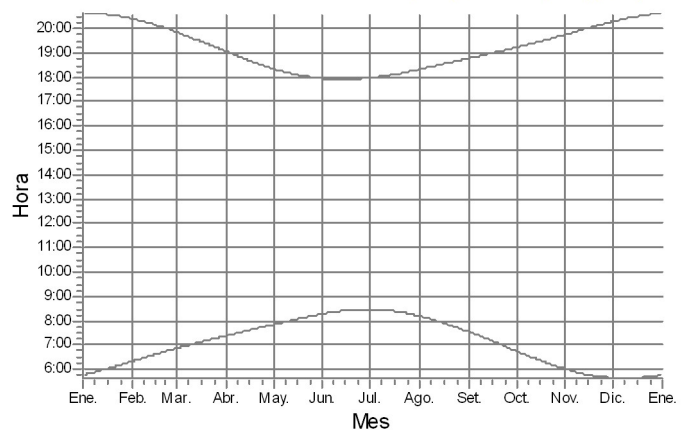
34: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (643)




35: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (646)




36: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (650)



Receptores de sombra

 Punto 6: Punto 6

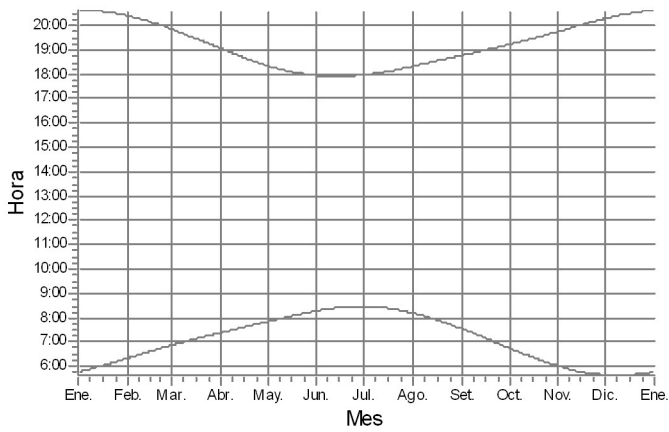
 Punto 7: Punto 7

 Punto 8: Punto 8

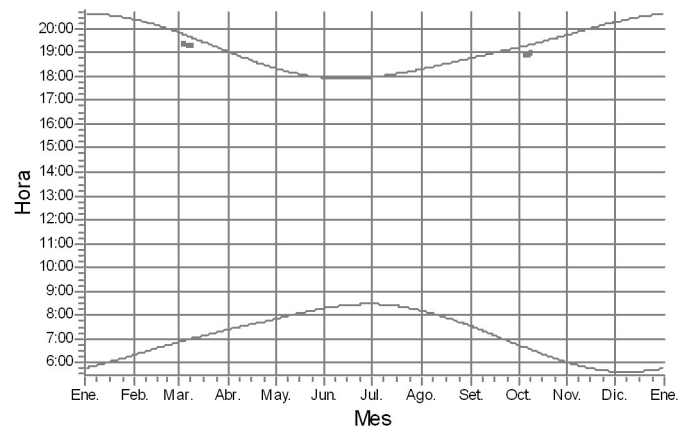
## SHADOW - Calendario por AG, gráfico

**Cálculo:** Restricciones nuevas 14.07


37: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (654)



38: GAMESA G114 2650 114.0 !O!hub: 93,0 m (TOT: 150,0 m) (659)

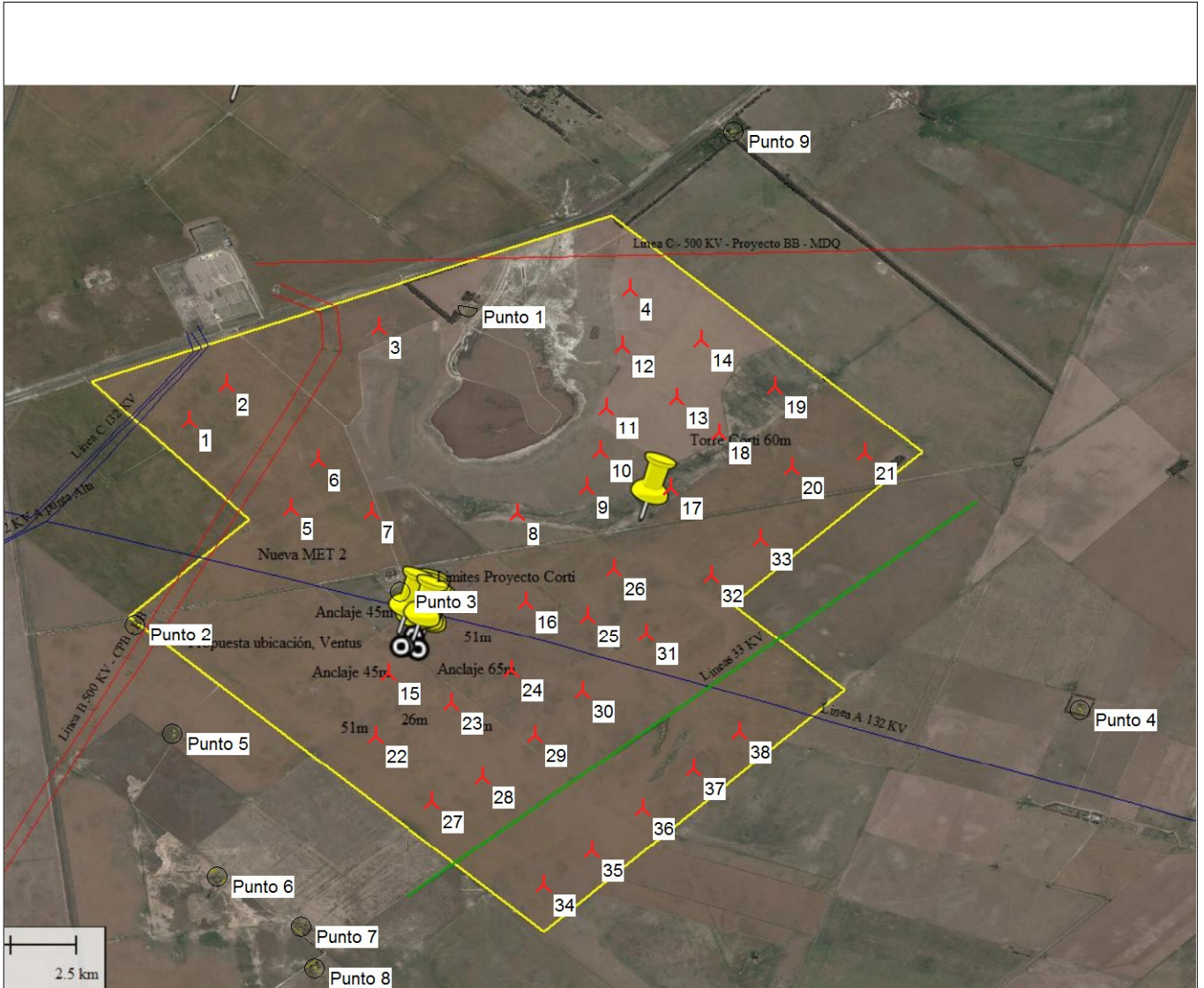


Receptores de sombra

 Punto 4: Punto 4

## SHADOW - Mapa

**Cálculo:** Restricciones nuevas 14.07



0 500 1000 1500 2000 m

Mapa: Bitmap map: 2,5km.jpg , Escala:40 000, Centro de mapa UTM (south)-WGS84 Zona: 20 Este: 584 643 Norte: 5 718 792

▲ Nuevo AG      📌 Receptor de sombra

Mapa de nivel de flicker: Project Wizard Elevation Data Grid (SRTM: Shuttle DTM 1 arc-second)