***The calculation of the***





 ***sunshine period***

***Definition:*** The sunshine period is the amount of how many

 hours the sun shines in a region in a year

But: Because of clouds blocking the sun there is no direct insolation possible

* so the sunshine period is only the time, when the sun can shine undisturbed on the earth!

It is very important for the photovoltaic system.

The average over many years of shining hours in Germany is around 1,550 hours.

There is a difference between regions in the south and at the coast, where the amount is sometimes over 2,000 hours and in the middle of Germany and the Ruhr area with less than 1,000 hours.

* at this side you can read the sunrise and sunset time in a region you decide

**Germany / Waldkraiburg:** <http://www.sunrise-set.com/?month=7&year=2015&longitude=12.401636300000063&latitude=48.2086516&zenith=90.833333333333&location=Waldkraiburg&resulting=1&view=month>

**France / Pessac**: <http://www.sunrise-set.com/?month=7&year=2015&longitude=-0.6303860000000441&latitude=44.80583&zenith=90.833333333333&location=Pessac&resulting=1&view=month>

**Italy / Bitonto**: <http://www.sunrise-set.com/?month=7&year=2015&longitude=16.691056900000035&latitude=41.1078251&zenith=90.833333333333&location=Bitonto&resulting=1&view=month>

**Finland / Kuopio**: <http://www.sunrise-set.com/?month=7&year=2015&longitude=27.67933849999997&latitude=62.8933347&zenith=90.833333333333&location=Kuopio&resulting=1&view=month>

**Turkey / Istanbul:** <http://www.sunrise-set.com/?month=8&year=2015&longitude=28.97835889999999&latitude=41.0082376&zenith=90.833333333333&location=Istanbul&resulting=1&view=month>

**Luxembourg / Luxembourg**: <http://www.sunrise-set.com/?month=7&year=2015&longitude=6.129583000000025&latitude=49.815273&zenith=90.833333333333&location=Luxemburg&resulting=1&view=month>

**Early spring: 20.03.2015**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Germany  | France  | Italy | Finland | Turkey  | Luxemburg |
| Sunrise | 05:11 | 06:03 | 04:54 | 04:07 | 04:05 | 05:36 |
| Sunset | 17:24 | 18:16 | 17:06 | 16:26 | 16:17 | 17:49 |
| Total sun | 12:13 | 12:12 | 12:11 | 12:18 | 12:11 | 12:13 |

 **Summer solstice:21.06.2015**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Germany  | France  | Italy | Finland | Turkey | Luxembourg |
| Sunrise  | 03:07  | 04:14 | 03:19 | 23:58 | 02:30 | 03:25 |
| Sunset  | 19:16 | 19:53 | 18:30 | 20:23 | 17:41 | 19:49 |
| Total sun | 16:08 | 15:39 | 15:11 | 20:25 | 15:10 | 16:24 |

**Autumn equinox:22.09.2015**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Germany  | France  | Italy | Finland | Turkey  | Luxemburg |
| Sunrise | 04:55 | 05:48 | 04:39 | 03:50 | 03:50 | 05:20 |
| Sunset | 17:10 | 18:02 | 16:52 | 16:13 | 16:03 | 17:35 |
| Total sun | 12:14 | 12:13 | 12:12 | 12:22 | 12:13 | 12:15 |

**Winter solstice:21.12.2015**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Germany  | France  | Italy | Finland | Turkey | Luxembourg |
| Sunrise | 06:56 | 07:35 | 06:13 | 07:40 | 05:23 | 07:28 |
| Sunset | 15:20 | 16:26 | 15:29 | 12:34 | 14:40 | 15:38 |
| Total sun | 08:24 | 08:50 | 09:15 | 04:54 | 09:16 | 08:10 |

Sources:

<http://modernus.de/solar-photovoltaik-anlagen/photovoltaik-ertrag-berechnung-ertragsrechner-rechner-sonnenstunden-sonneneinstrahlung>

<http://www.google.de/imgres?imgurl=http%3A%2F%2Fwww.hotel-sonnenschein.com%2Fsonne.jpg&imgrefurl=http%3A%2F%2Fwww.hotel-sonnenschein.com%2F&h=380&w=450&tbnid=OLCjNRzlPMa6pM%3A&docid=kRYWB9Tythbk9M&ei=qAqpVZL5M8GssAGY9ZegCA&tbm=isch&iact=rc&uact=3&dur=904&page=1&start=0&ndsp=18&ved=0CDUQrQMwAGoVChMIku2b96nixgIVQRYsCh2Y-gWE>

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