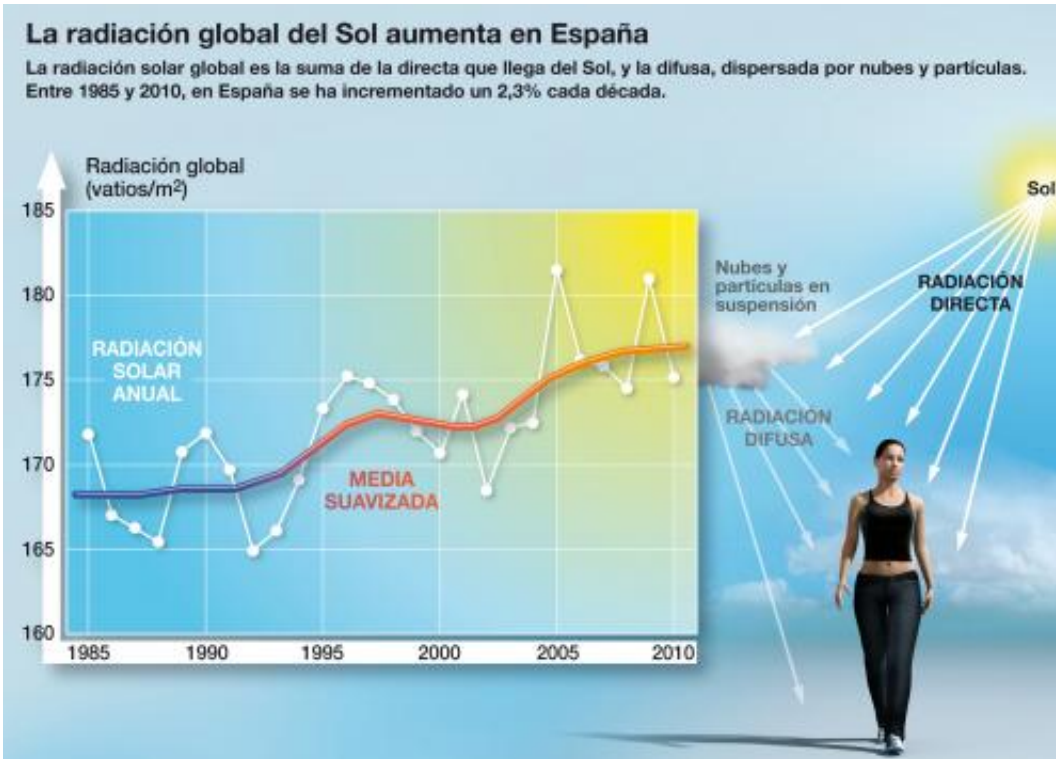


Spain receives ever more solar radiation

June 6 2013



Solar radiation in Spain has increased by 2.3% every decade since the 1980s.
Credit: SINC

Solar radiation in Spain has increased by 2.3% every decade since the 1980s, according to a study by researchers from the University of Girona and the Federal Institute of Technology (ETH) in Zurich. This increase is linked to the decreased presence of clouds, which has increased the amount of direct radiation reaching us from the Sun.

"The mean annual G series over Spain shows a tendency to increase during the 1985-2010 period, with a significant linear trend of + 3.9 W m⁻² [2.3% more] per decade." This is the main conclusion of a study published in the magazine 'Global and Planetary Change' by researchers from the University of Girona and the Federal Institute of Technology in Zurich (ETH, Switzerland)..

The season-by-season data show the same "significant" increase in solar radiation impacting the nation: + 6.5 W/m² per decade during the summer, + 4.1 W/m² in autumn, + 3.2 W/m² in spring and + 1.7 W/m² in winter.

"These data relate to global solar radiation, in other words the increase in direct radiation reaching us from the Sun plus diffuse radiation which is scattered previously by clouds, [atmospheric gases](#) and [aerosols](#)," explains one of the authors, Arturo Sánchez-Lorenzo, currently a postdoctoral researcher at the University of Girona.

What is intriguing is that the scientists found a decrease in the diffuse component, because of which direct radiation has increased to a proportionately higher degree. Only in 1991 and 1992 did diffuse radiation rise, and this was due to the ashes from Mount Pinatubo. In general, however, we can observe a [downward trend](#) of - 2.1 W/m² per decade between 1985 and 2010.

"The explanation lies in the fact that in Spain the amount of cloud has decreased markedly since the 1980s - as we have ascertained through other studies - and the tropospheric aerosol load may also have decreased," states Sánchez Lorenzo. "It seems to be very simple: fewer clouds result in higher solar radiation on the surface," he continues.

According to the scientists, this increase may also go hand in hand with more ultraviolet rays, an excess of which presents a health risk,

potentially leading to skin cancer.

More global brightening

The increase in global solar radiation is a phenomenon that has been observed in other parts of the world for almost 30 years, especially in developed countries, and it has been named "global brightening". The fall in the diffuse component has also been observed in Central European and Eastern countries.

The team behind the study has not yet analysed the solar radiation data for 2011-2013 provided by the Spanish State Meteorological Agency, but the data from other European weather stations suggests that this brightening is still on the rise.

"Studies such as these may be of interest to the solar energy industry, especially in countries like Spain, where not only do we already have a lot of direct [solar radiation](#) but now we are getting even more," affirms one of the other authors, Josep Calbó, who is a professor at the University of Girona.

More information: Sanchez-Lorenzo, A., Calbo, J. and Wild, M. Global and diffuse solar radiation in Spain: Building a homogeneous dataset and assessing their trends, *Global and Planetary Change* 100: 343-352, 2013.

Provided by Plataforma SINC

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