

FREQUENTLY ASKED QUESTIONS

THE IMPACT OF THE 20 MARCH 2015 SOLAR ECLIPSE ON THE EUROPEAN ELECTRICITY SYSTEM

GENERAL

1. The sun goes up and down every day. Why is a solar eclipse creating concern?

A solar eclipse is not comparable to a normal sunrise or sunset due to the fact that the speed of the solar in-feed is faster than a normal sunrise and sunset. It also impacts operational practices, as it occurs in the middle of the morning. It's like having 2 sunrises and two sunsets in the same day.

2. There have been solar eclipses in the past. Why could it be a problem this year?

Solar eclipses have indeed taken place in Europe several times in the past. The last one goes back to 1999. This year's eclipse is different because over the last ten years, the amount of photovoltaic (PV) generation has dramatically increased. According to European statistics¹, solar power covered 0.1% of all the electricity produced in Europe from renewable energy sources in 2002. More than ten years later, this figure has risen to 10.5%. In the continental Europe area alone, 3% of all the electricity consumption is covered by PV generation.

What makes this year's solar eclipse so special is the fact that there is now a non-negligible amount of energy generation units connected to the grid that are highly sensitive to variations in solar radiation. This solar eclipse will thus be an unprecedented test for Europe's electricity system, and useful to better understand the relationship between ambitious EU targets and the security of operation which all Europeans are very much depending on.

3. Why did ENTSO-E decide to produce a report about the 20 March 2015 eclipse?

In order to maintain the stability of their systems, transmission system operators (TSOs) have to anticipate and mitigate risks at all times. In the case of the solar eclipse, ENTSO-E member TSOs, who regularly exchange information and cooperate on operational issues, anticipated a year ago that the effect on the system would be significant enough to justify a specific analysis and report.

The ENTSO-E Impact Analysis on the Solar Eclipse of 20 March 2015 is the result of this preparatory and collaborative work. The ENTSO-E actions are in line with its mission when coordination values are at stake. In the light of this report, TSOs agreed on a series of countermeasures that they will activate if and when needed. Specific pan-European teleconferences will be organised during the eclipse to guarantee an optimal flow of information and maximum cooperation between operators across the whole European system.

4. Which countries will be affected by the eclipse?

The whole of the European area is concerned either directly or indirectly. The eclipse will have direct effects at different levels, being visible from Turkey to Greenland and from Spain to Norway. Indirectly, all countries of the region are affected due to their interconnection.

5. Will all countries be affected at the same time?

The shadow of the eclipse will gradually move across Europe over a couple of hours. A simulation of its path can be seen on the following website video from MeteoSwiss: <http://vimeo.com/117269669>

END-USERS**6. How will the public be informed if there is a problem on the power system during the eclipse?**

Each TSO is responsible for informing the public on national incidents happening on the power system it is operating. At the pan-European level, ENTSO-E has a Crisis Communication Tool available to its Members. This tool alerts Members and allows them to trigger coordinated actions. But national audiences are informed by the relevant TSO(s), not ENTSO-E.

STAKEHOLDERS/ MARKET PLAYERS**7. I am an electricity market player/stakeholder. Who will keep me informed of any disturbance on the electricity system due to the solar eclipse on 20 March 2015?**

Each TSO is responsible to keep market parties/ stakeholders informed before and during the event for the geographical area it is covering.

8. What measures are continental Europe TSOs putting in place to ensure the market will continue to function correctly?

The potential measures to be applied as described in the Impact Analysis) will not impact the normal function of the market since they are already used for normal business operations. In addition, we are fully transparent with communication to market participants

GENERATORS**9. I have a PV generation unit, should I switch it off during the eclipse?**

Owners of PV generation units are not requested to switch their units off. If the need arises, they will be asked to do so by the TSO of the area they belong to.

10. What is the impact of the solar eclipse on PV injection?

This information can be found in the Impact Analysis Report. In general, this will depend on the weather conditions of the moment. Hence this is one of the main reasons of uncertainty.

11. The information given by TSOs on the solar eclipse targets solar energy sources. Will the solar eclipse not affect other energy sources such as for instance, nuclear power plants?

No, they are not directly affected. However, they are indirectly affected because these other programmable resources will have to balance the deficit or surplus of the PV sources to correctly cover the load.

12. What about wind production on 20 March 2015. Has the effect of no wind and solar generation combined been evaluated?

Wind production will not be impacted due to the fact that wind forecasting is quite mature and thus reliable. This is less the case for sun production forecasting, which is more recent. According to forecasts, wind generation is expected to be normal on the day of the eclipse.

TSO COORDINATION

13. Are TSOs coordinating their actions across continental Europe to mitigate the risks generated by the solar eclipse for the electricity system?

Continental Europe TSOs are coordinating and have planned a series of countermeasures to maintain security of supply despite the significant risk the solar eclipse can cause to the power system. During the eclipse, the control rooms in the continental Europe region will be continuously connected via teleconferences to coordinate their actions in real-time during the eclipse.

14. Where can I find details of the countermeasures TSOs are planning in view of the solar eclipse?

TSOs have not designed specific countermeasures for the eclipse. They will be using the usual countermeasures TSOs resort to in order to operate their systems. The main difference is that in view of the particular challenge that the solar eclipse represents for the continental European power system, the countermeasures might be activated more rapidly than usual.

15. Are the countermeasures foreseen by the TSOs sufficient to mitigate all risks to the system during the eclipse?

TSOs have worked on preparations for the solar eclipse for several months to mitigate the risk of an unfavourable evolution during this event. Emergency plans should not be confused with this plan. However, as mentioned above, this year's solar eclipse will be a serious test for the continental Europe synchronous area. Despite TSOs preparations and coordination, the risk of incident cannot be completely ruled out. Beyond the countermeasures that they have agreed upon, TSOs would resort to the usual emergency procedures to protect the system if the need arises.

¹ http://ec.europa.eu/eurostat/statistics-explained/index.php/Renewable_energy_statistics