RGI Statement on the blackout in the Iberian Peninsula

May 2025

Many were quick, without any evidence, to prematurely attribute the blackout that occurred in the Iberian Peninsula on 28 April 2025 to renewable energy sources (RES). The investigation is still ongoing at both national and EU levels[1], and it will take time to fully assess what has happened. RGI urges a cautious and fact-based approach to public discussions, as root causes are yet to be determined.

Whatever the causes, it is of paramount importance to continue and even accelerate investment in robust electricity grids, flexibility options, to further integrate growing shares of renewable energy sources. European TSOs have long developed and operated the world's most interconnected electricity system, and many Member States, including Spain and Portugal, are increasingly demonstrating the feasibility of operating with high shares of renewables for extended periods[2]. RGI acknowledges the swift and effective response by Red Eléctrica and Redes Energéticas Nacionais (REN) in restoring system operations following the blackout, which generated essential lessons that will increase system security while we transit to a fully decarbonised energy system.

A decarbonised system requires coordinated and forward-looking system planning and a system supportive behaviour of the generation units. While we increase shares of variable RES, regulatory frameworks should evolve further to enable planning and operation that considers electricity grid infrastructure across all voltage levels, demand, flexibility solutions, and renewable generation—particularly wind and solar—as integral components of the system, not add-ons. Such a holistic approach will unlock optimisation opportunities and flexibility options across the energy system; it will increasingly provide system operators with the tools to deliver essential services efficiently and reliably.

RGI reaffirms that Europe can and should transition to a fully decarbonised energy system largely based on renewables. Once fully analysed, the incident can offer valuable insights into processes and system services as well as technical requirements across the energy system value chain to maintain system stability and security. In turn, this will enhance Europe's competitiveness, energy security, affordability, and resilience.

---

1 In May 2025, the ENTSO-E expert panel initiated the investigation into the causes of Iberian blackout with the participation of affected and non-affected Transmission System Operators (TSOs), the Agency for the Cooperation of Energy Regulators (ACER), National Regulatory Authorities (NRAs), and Regional Coordination Centres (RCCs).

2 See examples from Spain, Portugal, Greece, Germany, Poland and others, as reported by EMBER.

RGI Statement on the blackout in the Iberian Peninsula

May 2025

To create a common understanding of the concepts and terms involved in the public debate as well as enhance knowledge on the functioning of the energy system, RGI, together with our Members, has compiled a glossary (see ANNEX I below).

About RGI

RGI is a unique collaboration of NGOs and TSOs (Transmission System Operators) from across Europe engaging in an 'energy transition ecosystem-of-actors'. We promote fair, transparent, sustainable grid development to enable the growth of renewables to achieve full decarbonisation in line with the Paris Agreement. This statement does not replace or override the individual positions of RGI Member organisations.

RGI Members originate from a variety of European countries, consisting of TSOs from Belgium (Elia), Croatia (HOPS), France (RTE), Germany (50Hertz, Amprion, TenneT and TransnetBW), Ireland (EirGrid), Italy (Terna), the Netherlands (TenneT), Norway (Statnett), Portugal (REN), Spain (Red Eléctrica), Switzerland (Swissgrid) and UK (NESO); and the NGOs Bellona Europa, BIOM, BirdLife Europe, Climate Action Network (CAN) Europe, Ember, France Nature Environnement (FNE), Friends of the Earth Ireland, Fundación Renovables, Germanwatch, Legambiente, NABU, Natuur&Milieu, the Royal Society for the Protection of Birds (RSPB), WWF International and ZERO. Europacable, IUCN and T&D are Supporting Members.

RGI gratefully acknowledges the EU LIFE funding support

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the LIFE Programme. Neither the European Union nor the granting authority can be held responsible for them.

ANNEX I

Glossary

To create a common understanding of the concepts involved in the public debate as well as enhance knowledge on the functioning of the energy system, RGI, together with our Members, has compiled a glossary[3] of the following terms:

Ancillary service: a service necessary for the operation of a transmission or distribution system, including balancing and non-frequency ancillary services, but not including congestion management.

Balancing: all actions and processes, in all timelines, through which transmission system operators ensure, in an ongoing manner, maintenance of the system frequency within a predefined stability range and compliance with the amount of reserves needed with respect to the required quality.

Black start capability: the capability of recovery of a power-generating module from a total shutdown through a dedicated auxiliary power source without any electrical energy supply external to the power-generating facility.

Blackout state: the system state in which the operation of part or all of the transmission system is terminated.

Frequency: the electric frequency of the system expressed in hertz that can be measured in all parts of the synchronous area under the assumption of a consistent value for the system in the time frame of seconds, with only minor differences between different measurement locations. Its nominal value is 50Hz.

Frequency control: the capability of a power-generating module or HVDC system to adjust its active power output in response to a measured deviation of system frequency from a setpoint, in order to maintain stable system frequency.

Inertia: the property of a rotating rigid body, such as the rotor of an alternator, such that it maintains its state of uniform rotational motion and angular momentum unless an external torque is applied.

Inverter: a device that converts DC power into AC power synchronised to the utility grid frequency and voltage.

---

[3] The definitions have been identified, among others, in relevant EU legislation, such as the Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generators, OJ L 112, 27.4.2016, p. 1–68, Article 2, the Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation, OJ L 220, 25.8.2017, p. 1–120, Article 3, the Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity OJ L 158, 14.6.2019, p. 54–124, Article 2, the Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity, OJ L 158, 14.6.2019, p. 125–199, Article 2, the Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion *management*, OJ L 197, 25.7.2015, p. 24–72, Article 2, as well as international standards.

Load: the total amount of electric power delivered or required at any specific point or points on a system.

Load shedding: the automatic or manual disconnection of consumption.

Operational security limits: the acceptable operating boundaries for secure grid operation such as thermal limits, voltage limits, short-circuit current limits, frequency and dynamic stability limits.

Oscillation: electromechanical oscillations, also known as power oscillations, are a phenomenon of angle stability of power systems under small perturbations. Electromechanical oscillations involve generators which oscillate against each other in the power system. Electromechanical oscillations can be seen in the different variables of the power system, such as bus frequencies and voltages, power flows and current flows through the branches of the power system, among others. Electromechanical oscillations can be divided into local oscillations and inter-area oscillations.

Rotational power: the amount of kinetic energy stored in the rotating masses directly connected to the grid.

Synthetic inertia: the facility provided by a power park module or HVDC system to replace the effect of inertia of a synchronous power-generating module to a prescribed level of performance.

Voltage control: the manual or automatic control actions at the generation node, at the end nodes of the AC lines or HVDC systems, on transformers, or other means, designed to maintain the set voltage level or the set value of reactive power.

50 hertz: the nominal value of frequency in the continental European synchronous area. It means that the alternating current oscillates 50 times every second.