

Transmission system operators

Definition

Electricity transmission system operators (TSOs) are responsible for the reliable transmission of power from generation plants to regional or local electricity distribution operators (DSOs) by way of a high voltage electrical grid. Since TSOs are usually a natural monopoly, they are subject to state regulation.

TSOs provide grid access to the electricity market players (i.e. generating companies, traders, suppliers, distributors and directly connected customers) according to non-discriminatory and transparent rules.

Each European Member State typically has one national TSO but in Germany's case, there are four, each responsible for a particular "control area". TSOs are often wholly or partly owned by state governments.

Responsibilities

TSOs are tasked with maintaining, operating, planning and extending, a robust and cost-efficient network. With safety and reliability in the foreground, their main responsibility is to ensure that the grid remains stable at all times so as to safeguard the consumer's security of supply. Security of supply entails meeting the demand for transmission while keeping generation/consumption levels balanced as to avoid any fluctuations in frequency, interruptions in supply and even grid failure. At times, balance necessitates making appropriate levels of generation reserve capacity available.

In the EU, TSOs are also expected to set the minimum operational rules and obligations on network security and be able to forecast electricity demands for a medium-term period. Moreover, TSOs must inform governments about and provide any information on any intended investments to the network, for both internal lines and cross-border interconnection.

Unbundling

With the Third Energy Package in 2009, the EU introduced the obligation for grid operators to be unbundled from power generation. Three different unbundling models are possible:

- **Full Ownership Unbundling** - this option requires that the same person or persons controlling TSOs are not entitled to directly, or indirectly, have any interest in companies which generate, produce or supply electricity. This is the European Commission's preferred option.
- **Independent System Operator ("ISO")** - under this option, the vertically-integrated company still owns the transmission network, but the operation of the network is carried out by an independent system operator appointed by the relevant E.U. Member State and approved by the European Commission.
- **Independent Transmission Operator ("ITO")** - this is the lowest threshold for unbundling and allows for the ownership of the transmission network to remain with the vertically-integrated company but requires the company to comply with a number of rules aimed at ensuring the independence of its supply and generation businesses, e.g. the



development of an annual investment plan that needs to be adopted by the national regulator.

ENTSO-E

ENTSO-E is a network of 41 TSOs from 34 countries that together promote various aspects of European energy policy. It was established in 2009 with the Third European Energy Package. In the package, the EU legislation has mandated ENTSO-E with the delivery of a biennial Ten-Year Network Development Plan (TYNDP), which identifies gaps in grid infrastructure from a European perspective. The first TYNDP was published in 2010.

More information

- [TenneT](#): A description of TSO responsibilities on the TenneT website
- [ENTSO-E](#): Official Website
- [List of ENTSO-E members](#)
- [ENTSO-E's TYNDP](#)

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