

DSO Technical Expert Group

Preliminary views on

Operational Planning and Scheduling Code

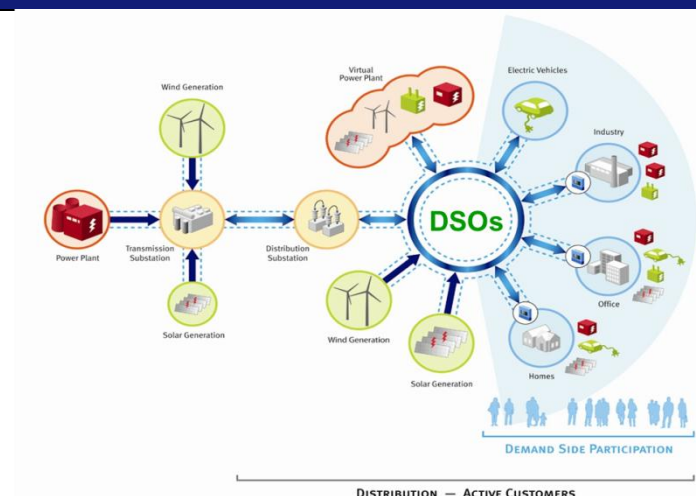
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Chairman of EURELECTRIC

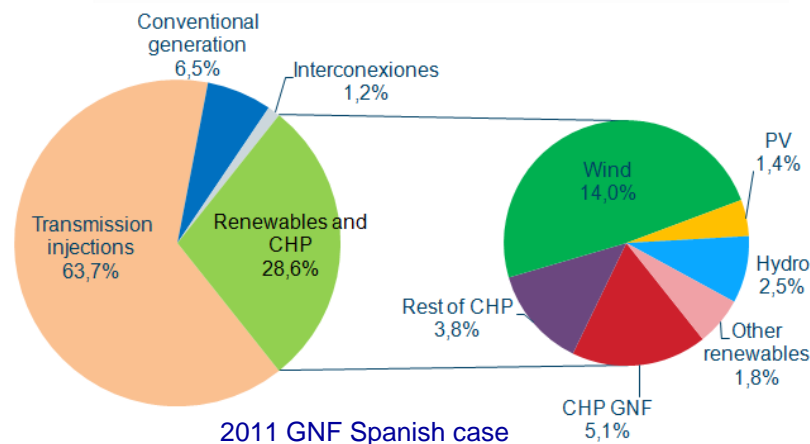
TF System Operation

23rd May 2012, Brussels

DSO's as neutral Market Facilitators and System Operators



Source: EURELECTRIC 10 Steps to Smart Grids



Most of **new generation** to be connected to distribution networks
Most of the demand side flexibility has been/will be **developed on distribution networks**

- Provide **information** to **market actors** in a transparent, non-discriminatory and efficient way.
- Ensure **security of supply** and **quality of service** in their networks
- Perform **DER management** actions for OS and OP&S

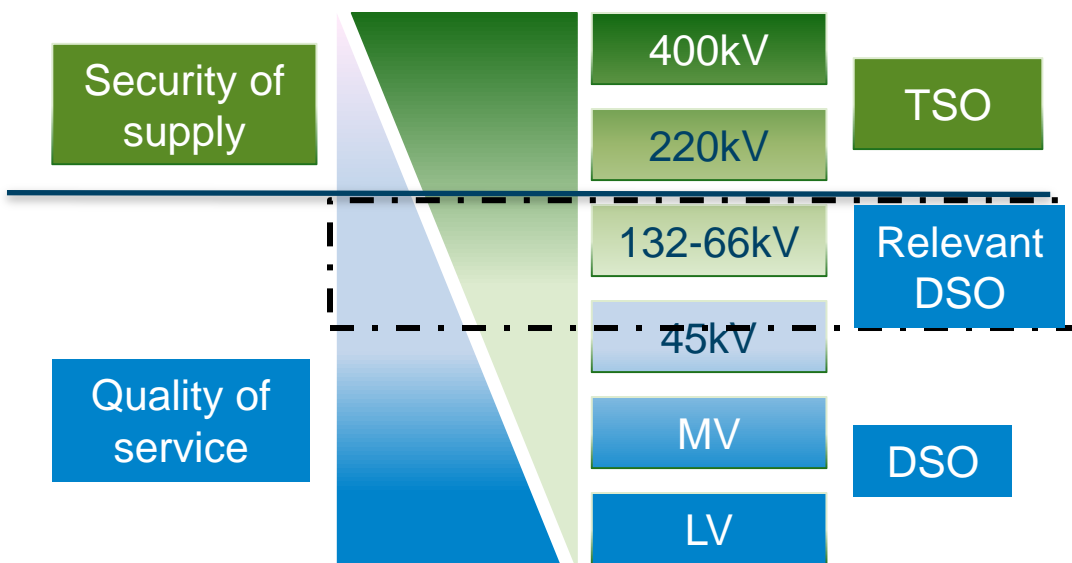
DSO's are system operators and not system users

Relevant DSO's, like TSO's, are also **in charge of OS and OP&S** in their networks.

Relevant DSO's are related to **cross border issues**.

High level approach OP&S for **relevant DSO's** should **be treated at the OP&S code**.

DSO's should **aggregate/manage DER information** and **share it with TSO's** if necessary



Country	EHV	HV	MV	LV
Germany	380 kV, 220 kV	110 kV	30 kV, 20 kV, 15 kV, 10 kV	400 V
Portugal	400 kV, 220 kV	132 kV, 60 kV	30 kV, 15 kV, 10 kV, 6 kV	400 V, 220 V
Spain	400 kV, 220 kV 220 kV	132 kV, 110 kV, 66 kV, 45 kV	30 kV, 20 kV, 15 kV, 13.5 kV, 11 kV	400 V, 230V
Sweden	400 kV, 220 kV 220 kV	130 kV, 110 kV, 70 kV, 40 kV, 30 kV	24 kV, 12 kV	1 kV, 400 V
UK	400kV; 275kV	132 kV	33 kV, 11 kV	400V

Transmission

Distribution

Definitions in the code

The **codes have different definitions**. **Coherence** is needed. Some examples...

Distribution System — medium or low voltage electricity grid for supplying end consumers or electricity supply companies

Distribution System Operator (DSO) — natural person or legal entity responsible for ensuring safe and reliable operation of a Distribution System and the technical quality of the power supply. Distribution System Operator ensures...

Observability Area — An area of the relevant parts of the Transmission Systems of the TSO and its neighbouring TSOs, on which TSO shall implement a real-time monitoring and modelling to ensure reliability of the respective responsibility area.

System User — any natural or legal person supplying to, or being supplied by a transmission or distribution system. System Users are: Generators, Consumers and Distribution System Operators

Significant Grid Users — every Grid User that is able to influence transmission flow patterns beyond the defined thresholds, as a consequence of the events or actions in the equipment under its own.....

Relevant TSO/DSO...

System operators

In some countries distribution also comprises high voltage

To consider legal DSO definition from 2009/72 directive?

Please consider the relevant DSO point of view in that definition

DSO's are not system users

ACER FG definition is different

No definition made at the code

To consider ACER definition

Data for Security Analysis and Scheduling

Relevant DSO's, like TSO's, need also information for security analysis and Scheduling.

At year ahead timescales, all the DER (embedded in distribution) information required by TSO's will be gathered by DSO's and facilitate it to TSO's

At short term timescales relevant DSO's will need DER and TSO information for OP&S purposes

Requirements for Voltage control by DSO's

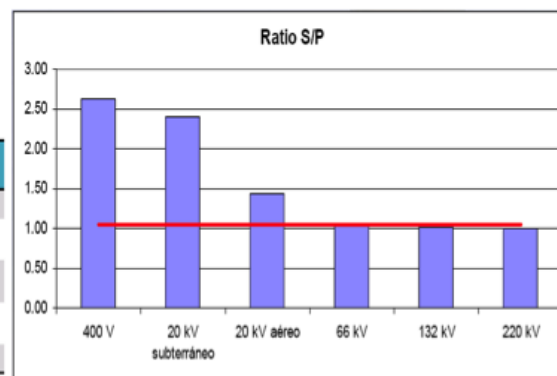
DER connected to relevant DSO's should participate in voltage control.
TSO must agree and coordinate voltage control actions with DER embedded in distribution networks

Voltage control is a local phenomenon where active power (P) effect in voltage control is much more significant than reactive power (Q) in distribution networks.

TSO should provide enough Q reserves to DSO's and not viceversa. Q will have to be managed by DSO's to compensate DER P effect.

HV	MV	LV
<div>DG is able to participate in voltage control optimally</div>	<div>PF Control</div> <div>Voltage Control</div>	<div>PF Control</div> <div>Voltage Control</div>

Nivel de tensión	R (Ω/Km)	X (Ω/Km)	R/X
400 V	0.4	0.09	4.44
20 kV subterráneo	0.27	0.118	2.29
20 kV	0.4261	0.4000	1.06
66 kV	0.1194	0.3856	0.31
132 kV	0.0718	0.4100	0.17
220 kV	0.0463	0.3155	0.15
400 kV	0.0268	0.2766	0.097



Voltage Level	DG technology	Power factor control	Voltage set point control
400 V	PV Micro CHP	✓	✗
20 kV (Cable)	PV CHP Small wind power	✓	✗
20 kV (OHL)	PV CHP Small wind power	✓	✗/✓
66 kV	PV CHP Wind power	✓	✓
132 kV	PV CHP Wind power	✓	✓

In MV and LV networks only the DG PF control approach is possible. If Voltage control setpoint in MV and LV is required DG's will have to reinforce their assets with more than double of reactive power equipment compare with active power capacity, what is not efficient.

DSO contribution to voltage control:

- ✓ Provide safe voltage margin to customers
- ✓ Minimize losses (minimize Q flows)

DSO's Recommendations

- DSO's are key agents as **market facilitators and system operators, not system users.**
- **Relevant DSO's** are also in charge of security of supply so that **OP&S issues should be included in the code for relevant DSO's purposes.**
- **Definitions** should be **clear and consistent** among the codes. European legislation should taken into account.
- **Data for security and scheduling** purposes at **short time** ahead scales should be **considered for relevant DSO's**
- Voltage control is a local phenomenon. **TSO to provide reserves to DSO** and not vice versa. **Relevant DSO might receive DER voltage control contribution.** IF TSO required DER information, DSO will act as facilitators.
- More detailed comments to the code will be sent by 1st of June

Thank You For Your Attention!

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