



MV/LV Transformers for Distribution
Network Solutions

transforma.smart

Transformer with on-load tap
changer

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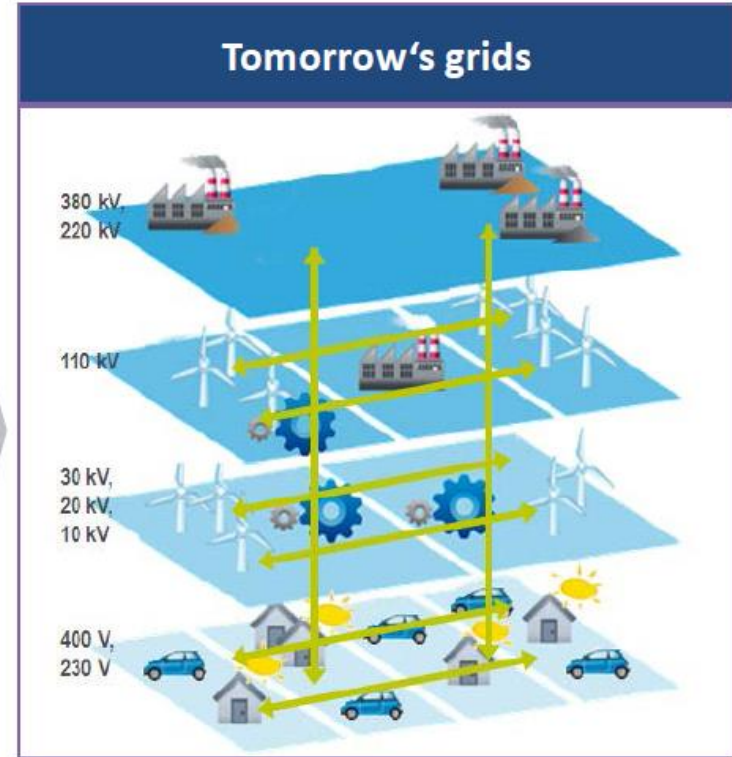
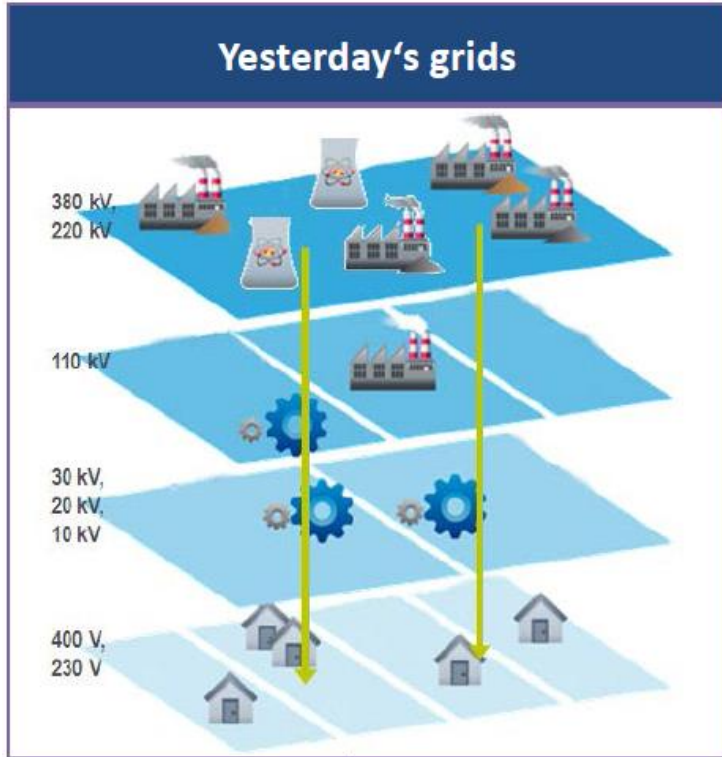




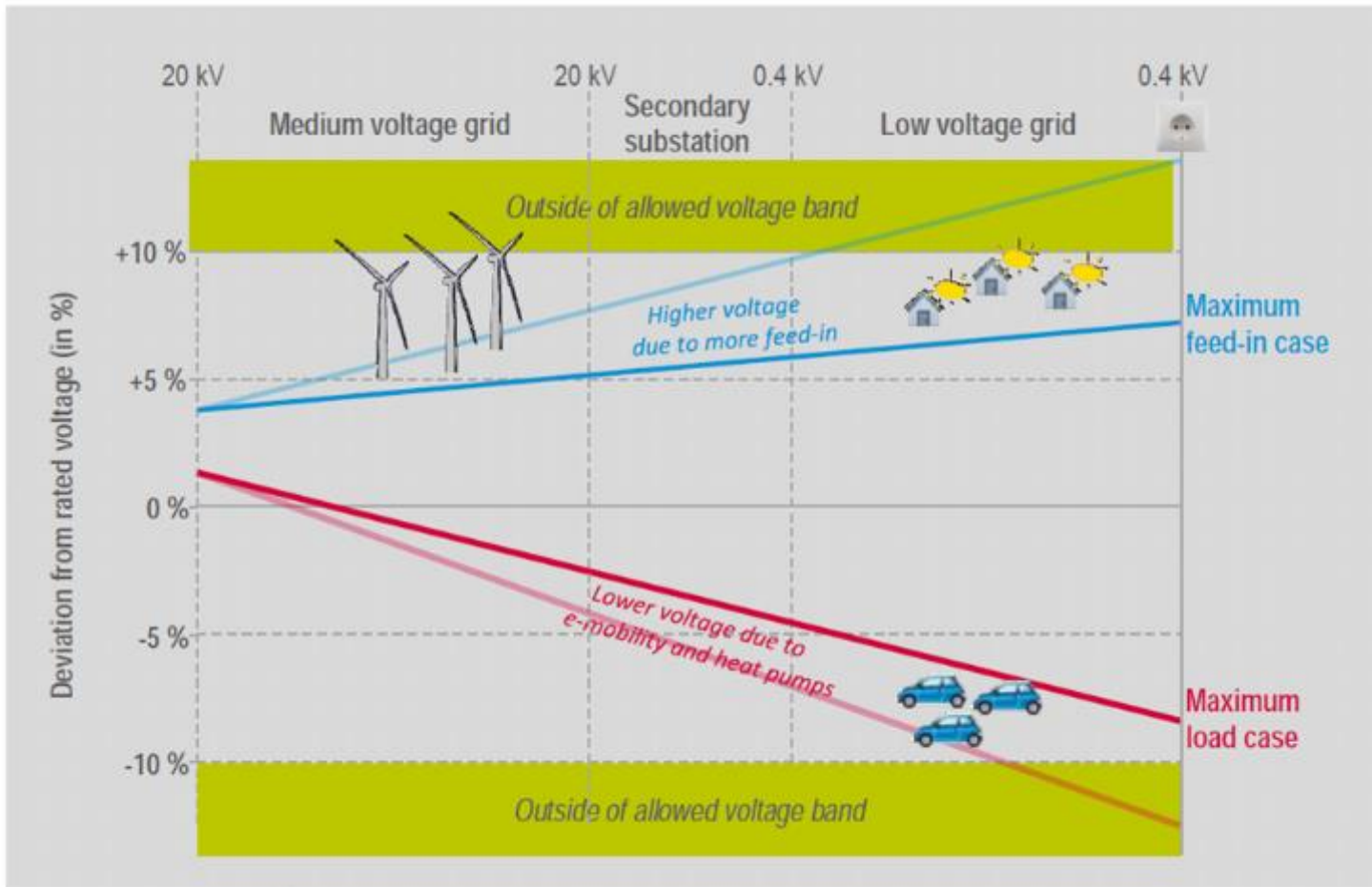
I. Voltage regulation in LV



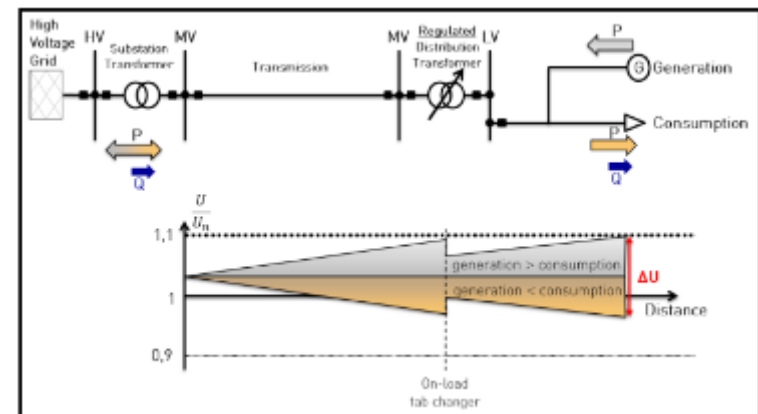
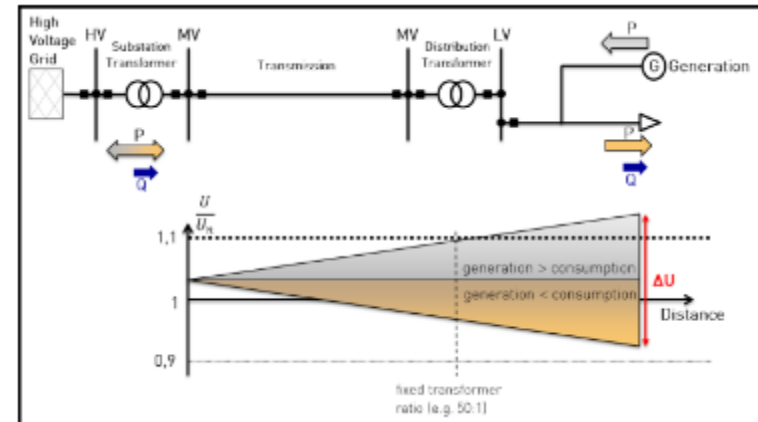
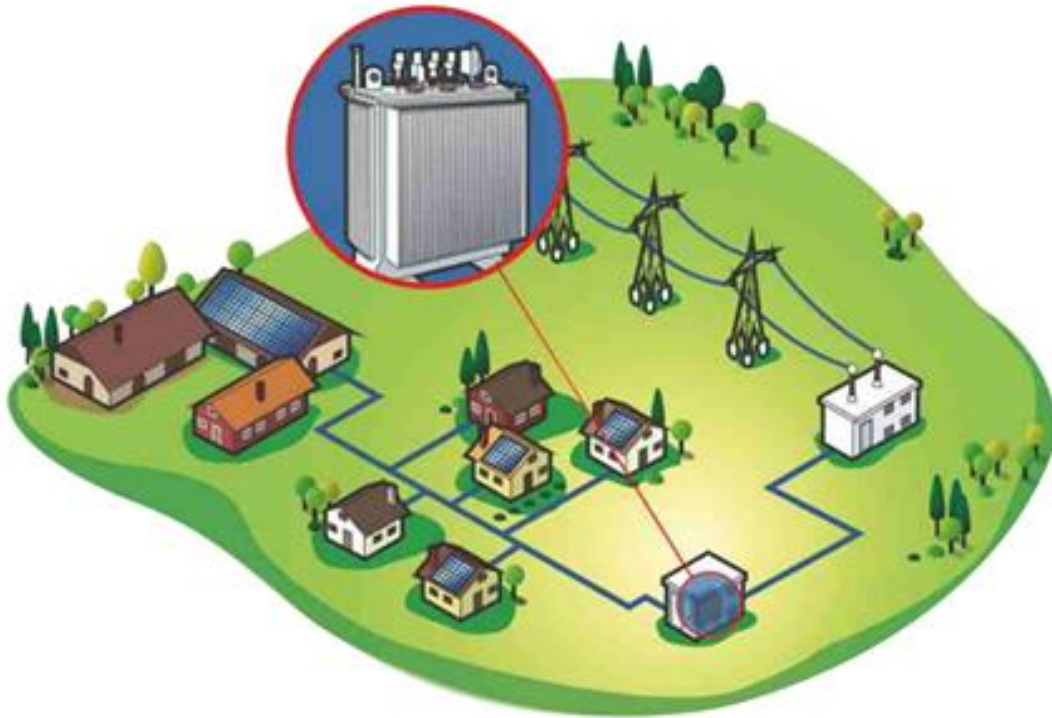
Need for voltage regulation in LV



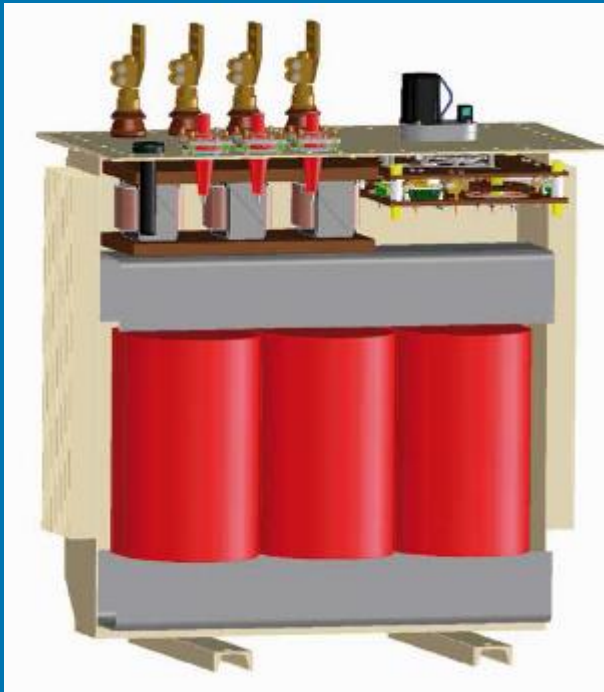
Need for voltage regulation in LV



Need for voltage regulation in LV



https://www.youtube.com/watch?v=hOr2_69cidU



II. Technical data



- **SAFETY**

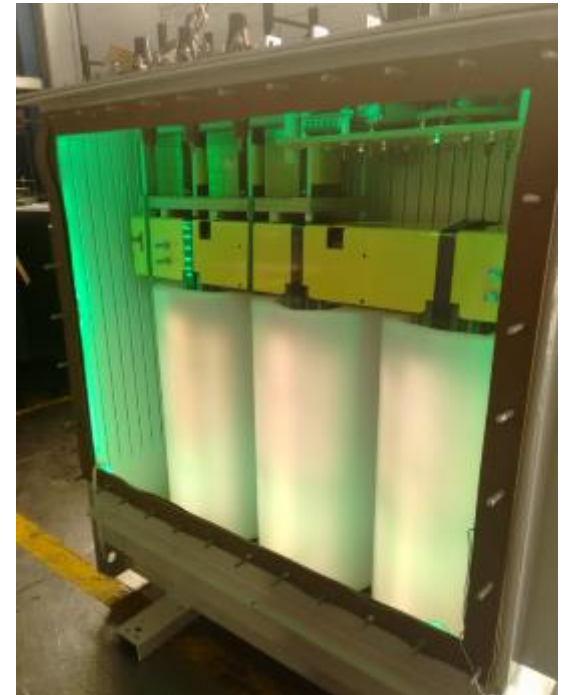
- Tested according to IEC 60076, IEC 60214 and IEC 61000
- Own laboratory facilities: UDEX, Ormazabal Smart Grid Lab connected to our High Power Lab (2500 MVA)
- Natural biodegradable dielectric with high fire resistance

- **RELIABILITY**

- Maintenance free
- Proven vacuum technology
- Balanced mechanical operation
- Service life equivalent to an off load tap changer transformer

- **EFFICIENCY**

- Retrofitting: similar footprint as conventional transformers
- Reduced losses according to EU Regulation No. 548/2014



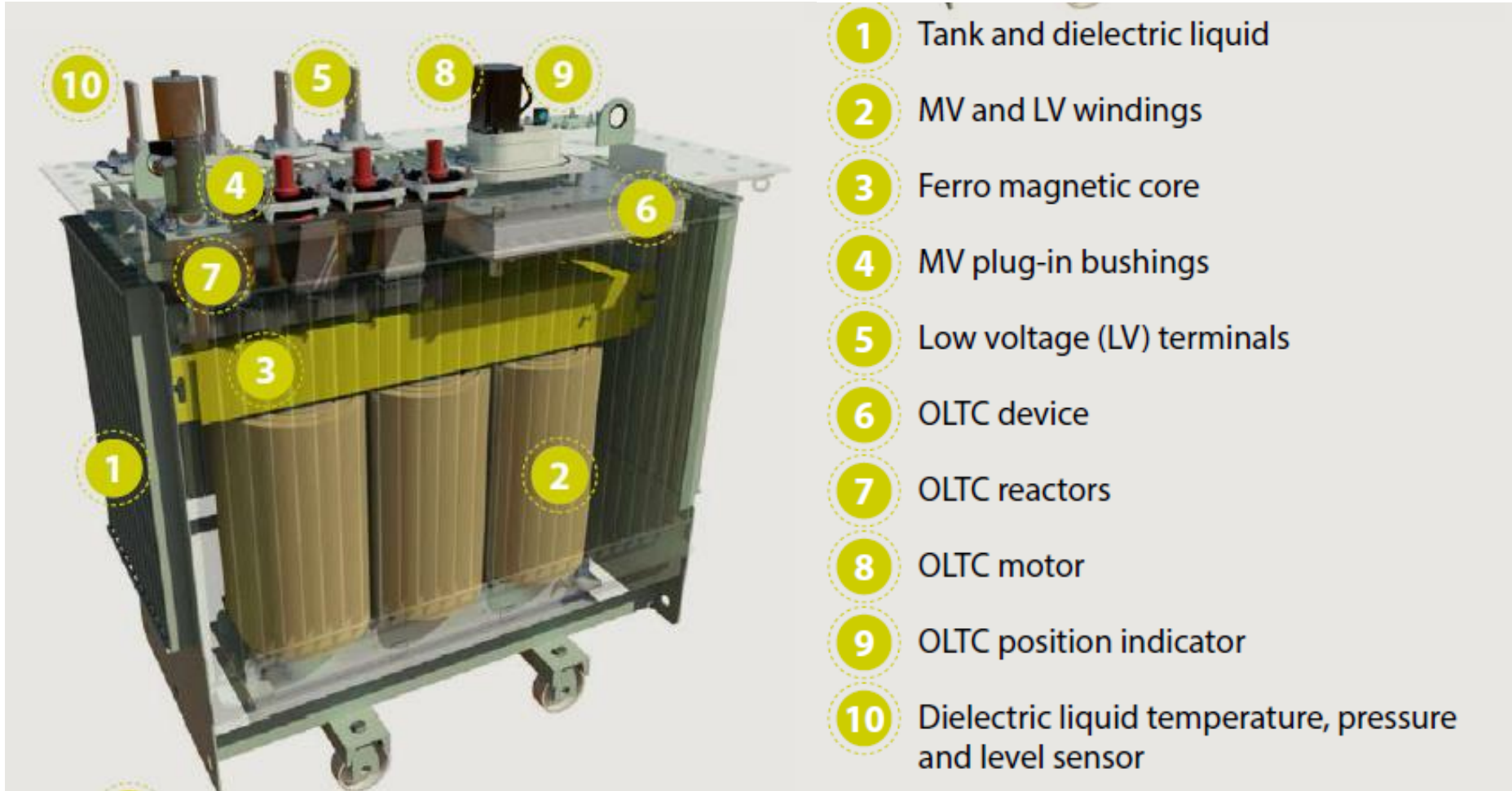
Technical data transforma.smart

Rated power	[kVA]	Up to 1000
Rated voltage	[kV]	Up to 24
Insulation level		LI 125 AC 50
OLTC positions		Up to 9
Step voltage	[V]	Maximum 600
Low voltage	[V]	In accordance with customer requirements
Winding material		Cu or Al
Losses		According to EU 548/2014
Short-circuit voltage		In accordance with customer requirements
Vector group		In accordance with customer requirements
Frequency	[Hz]	50 or 60
Type of cooling		ONAN
Max. ambient temperature		40 °C
Protective devices / accessories		Temperature sensor & customer requirements



III. Design



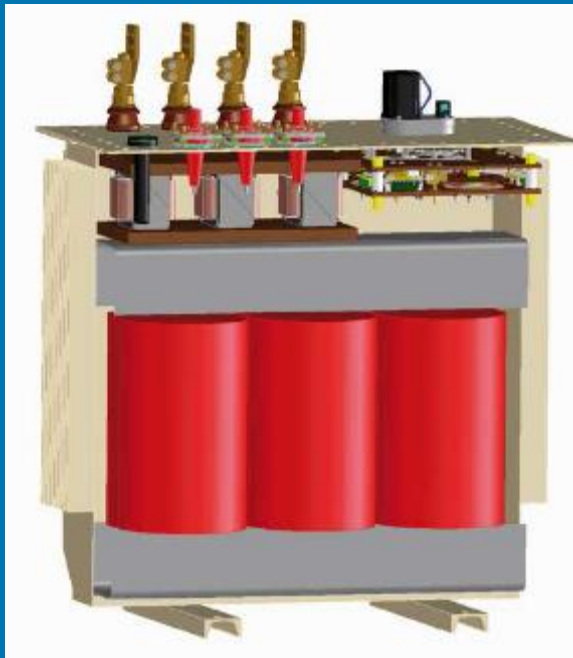


- 1 Tank and dielectric liquid
- 2 MV and LV windings
- 3 Ferro magnetic core
- 4 MV plug-in bushings
- 5 Low voltage (LV) terminals
- 6 OLTC device
- 7 OLTC reactors
- 8 OLTC motor
- 9 OLTC position indicator
- 10 Dielectric liquid temperature, pressure and level sensor

Design Ecodesign

- **Reduced losses** according to EU Regulation No. 548/2014 (**Ecodesign**)
- **CO2 footprint reduction** (investment deferral)
- **Reduced volume**: less oil, steel, weight...
- Natural **biodegradable ester oil** or mineral oil
- **Renewable** energy **integration**





IV. Conclusions



A solid orange square located in the top-left corner of the slide.

Conclusions

- Innovative **compact design**
- **Reduced losses** according to EU Regulation No. 548/2014 (**Ecodesign**)
- Natural **biodegradable dielectric** with **high fire resistance**
- **Service life** equivalent to an off load tap changer
- **Similar footprint** as conventional transformers
- **Reduced volume**: less oil, steel, weight...
- **Renewable** energy **integration**
- Easy read **tap position**
- **Control cabinet** with LCD display
- Different alternatives for **communications**



Thank you

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