



## CUSTOMER'S NEEDS IN PQ AREA



# Outline

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1. EU Energy situation

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2. Electrical Grids

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3. Stakeholders

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4. Power Quality

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5. TracePQM Project

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# 1. EU Energy situation



Production and promotion of energy  
from renewable sources in the EU

## **Original Renewable Energy Directive 2009/28/EC:**

EU to fulfil at least 20% of its total energy needs with renewables by 2020

## **Revised Renewable Energy Directive 2018/2001/EU:**

EU for 2030 to fulfil at least 32%, with a clause for a possible upwards revision by 2023

## **European Energy Union (April 2019)**

Strategy to guarantee accessible, affordable, secure, competitive and sustainable energy for all Europeans.



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## EMN Smart Grids

European Metrology Network in Smart Electrical Grids

Gert Rietveld  
Marijn van Veghel  
Paris, 9 January 2017



SMART ELECTRICITY  
GRIDS

Kick-off Meeting:  
Ljubljana  
13<sup>th</sup> May 2019



## VSL Activities and Actors: strong NMI community & many stakeholders



**10 NMIs committed so far:** VSL (NL), INRIM (IT), LCOE (ES), LNE (FR), METAS (CH), NPL (UK), PTB (DE), RISE (SE), SIQ (SI), VTT (FI)

**Linked to > 13 JRP:** SmartGrid 1 & 2, HVDC, GridSens, FutureGrid 1 & 2, ELPOW, TrafoLoss, TracePQM, MyRails, MeterEMI, ROCOF, ...

### Very extensive stakeholder interaction

Utilities, Standardisation bodies (Cenelec, IEC),  
Manufacturers (grid components, measuring instrumentation),  
Service providers, R&D (universities, knowledge institutes),  
Market Surveillance Authorities, Governments

### Activities

- Regular roadmapping activities with stakeholders
- Development of a website and promotional material
- Promoting grid metrology
- Exchange of researchers, access to large facilities
- Creation of training materials



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9-1-2018

Smart Grid EMN, 2017-10-04

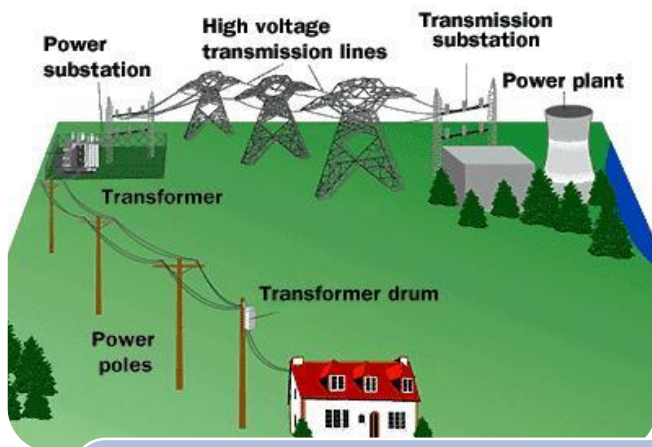
Courtesy of VSL

Final Dissemination Workshop  
Brno, 27<sup>th</sup> – 28<sup>th</sup> May 2019





## 2. Electrical Grids: from today to tomorrow



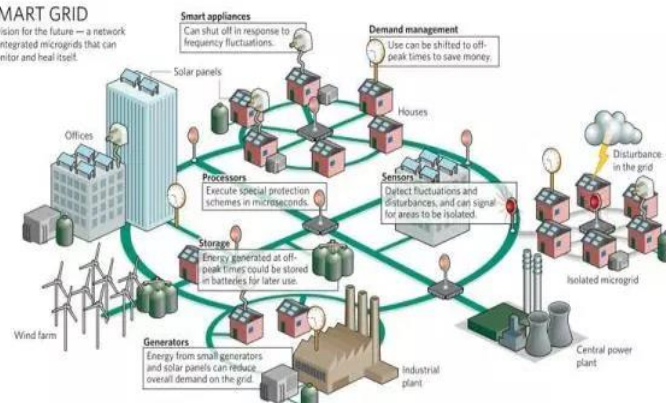
### TODAY

- Large central power stations
- Unidirectional power flow
- National power balance



### SMART GRID

A vision for the future — a network of integrated microgrids that can monitor and heal itself.

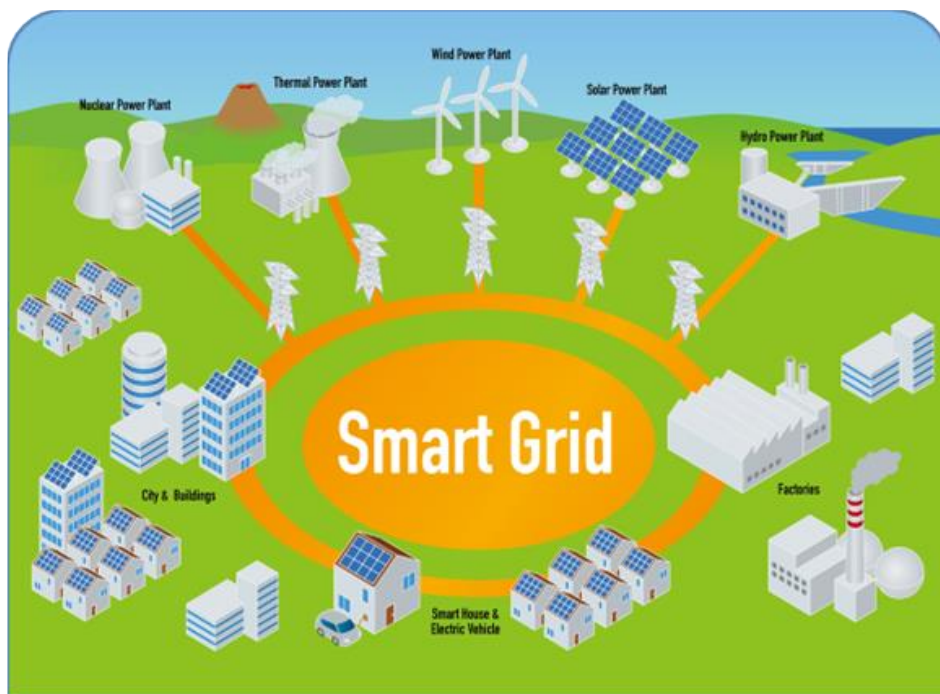


### TOMORROW

- Power station + distributed generation
- Bi-directional power flow
- European solution for balancing power



## Smart Electrical Grids Challenge



Increasing numbers of decentralised renewable sources cause:

- ☐ Deterioration in the grid's power quality
- ☐ Increasing demand for traceable and accurate measurements of power and PQ
- ☐ Need of calibration for power analyzers, PQ monitors and power and PQ calibrators



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### 3. Stakeholders



Users



Electricity network and services companies



Manufacturers



Researchers



Standardisation bodies



Government



## 4. Power Quality

### Power Distribution Grid

- ❑ Renewable energy sources with fluctuating power
- ❑ Non-linear loads
- ❑ Highly sensitive electronic equipment
- ❑ Power Quality Monitoring is essential

### Power Quality Monitoring

- ❑ Large number of diverse parameters (harmonics, flicker, dips, swells.....)
- ❑ IEC 61000-4-30, IEC 62586-2, IEC 61000-4-15, IEC 61000-4-7
- ❑ Wide range of measuring instrumentation





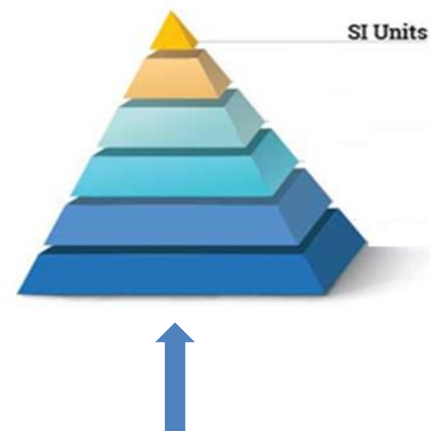


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**To ensure comparability of results,  
SI traceability of electrical power and PQ  
measurements is required**

**But it is difficult to obtain  
traceability for all PQ parameters**





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## 5. Project



### *Traceability Routes for Electrical Power Quality Measurement*



**OBJECTIVE:** to develop and validate a modular metrology grade system accessible across Europe for the measurement of power and PQ parameters using digital sampling techniques.

***Successful implementation of this system will pave the way for increased adoption of renewable energy across Europe.***



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# Meeting the customer's needs



## Industry:

- traceable PQ calibration according to IEC standards
- increased accessibility of calibration services



## Science:

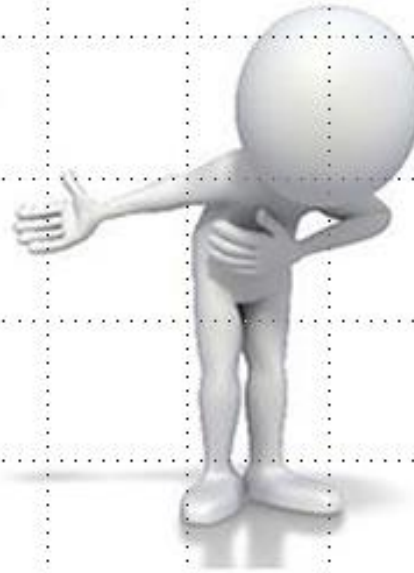
- coordinated research activities
- bridging gap between NMIs with different knowledge level



## All users:

- open access to project outputs
- flexible design of the measurement setup
- guidance for traceable power and PQ measurements

**THANK YOU  
FOR YOUR  
ATTENTION**



## **Final Dissemination Workshop**

