Welcome!

Workshop
EMPIR 2019 TP “Energy”

22 – 23 October 2018, LNE

Agenda

	October 22 Afternoon – Plenary sessions	Room Plenary
12:00 – 13:00	Registration	
13:00	Opening and welcome by LNE	Gert Rietveld Maguelonne Chambon
13:10	Introduction into the EMPIR 2019 “Energy” call	Gert Rietveld
13:40	**Measurement needs in Energy Conversion and Storage**	**Massimo Santarelli, Politecno Torino**
14:30	**Metrological challenges in the future Transmission Grid**	**Sonja Berlijn, Stattnett**
15:20	**Coffee break**	
16:00	**Energy and Standardization Challenges**	**Ashok Ganesh, CEN CENELEC**
16:50	Introduction to parallel session discussions	Gert Rietveld
17:15	Closing	
	October 23 Morning – Parallel breakout sessions	
9:00 to 11:15	**Energy mix: Renewables (wind, solar, biofuels, hydrogen), and conventional generation (carbon-based, nuclear, LNG)**	
	Storage and Conversion, fuel cells	
	Energy grids (Gas, Electricity)	
	Energy use and Efficiency	
	Recycling / Energy Harvesting, Mathematics and Modelling, Big Data and Data Analytics	
11:15	**Plenary closing session** - Highlights of the breakout sessions - Closing remarks	**Room Plenary** Session chairs Gert Rietveld
12:00	**Lunch**	

Introduction into the EMPIR 2019 “Energy” call

Workshop EMPIR 2019 TP “Energy”

22 – 23 October 2018, LNE

Gert Rietveld (VSL)

EURAMET TG Energy chair

Outline

- Energy Transition
- Metrology research – SRA
- Review EMPIR 2016 Energy projects
- EMPIR 2019 call on “Energy”
- Summary

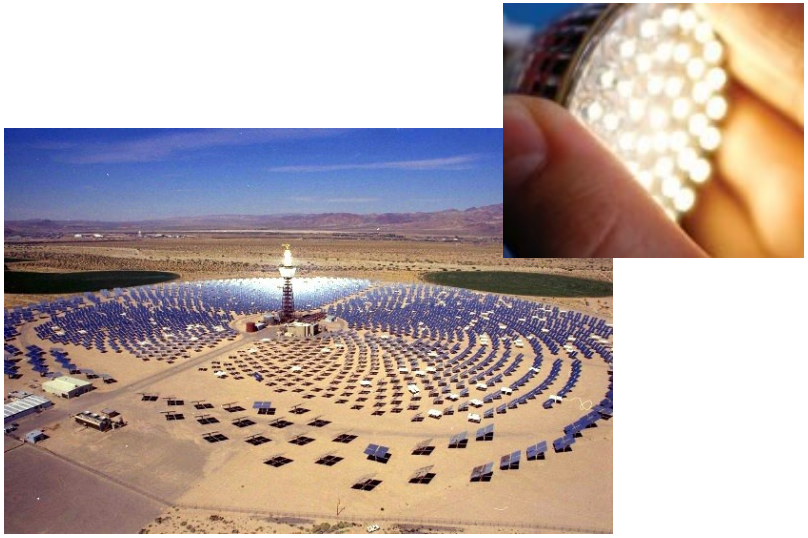
Energy Transition

20/20/20 aims EU for 2020:

- 20 % reduction CO_2 emission
- 20 % renewable energy
- 20 % less energy (efficiency)

Energy 'trilemma' (World Energy Council)

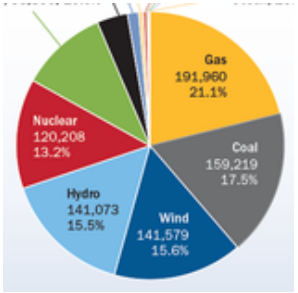
- Reduce carbon emissions
- Maintain affordable energy
- Secure energy supply



Solving the Energy Trilemma

EU: solve the Energy 'Trilemma' by ***realising a sustainable, affordable, secure energy infrastructure*** *via*

- Diversification of fuel mix
- Low-carbon energy generation (electricity)
- Smart electricity grids
- Electrification
- Better energy performance of buildings
- Improved energy efficiency



DIRECTIVE 2014/94/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 22 October 2014
on the deployment of alternative fuels infrastructure

establishing a framework for the setting of ecodesign requirements for energy-related products

⇒ New era of energy supply and energy use

Energy Metrology SRA

Key Question: how can metrology research support the Energy Transition and make a crucial difference?

⇒ Cooperation required

⇒ EMRP / EMPIR programme

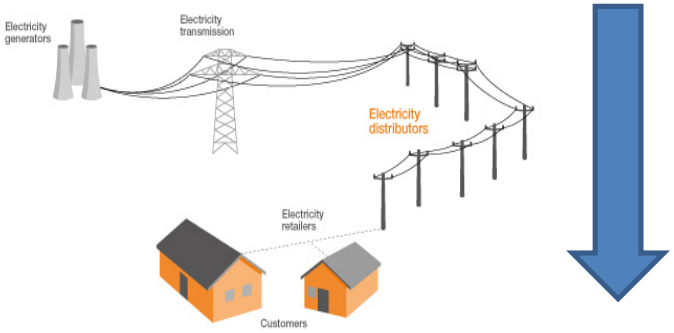
⇒ Strategic Research Agenda identifies metrology challenges

Strategic Research Agenda for Metrology in Europe

Version 1.0 (03/2016)

http://www.euramet.org/research-innovation/strategic-research-agenda/

Energy Supply Chain



Energy metrology challenges

1. Energy production & conversion
2. Energy transport and storage
3. Energy use
4. Efficiency & cross-cutting themes

EMPIR 2016 Energy call - review

EMPIR 2016 Energy call did *not* indicate *priorities! (all subjects covered)*

Energy ranked list		
1	JRP-g07	MetroHyVe
2	JRP-g11	PV-Enerate
3	JRP-g16	HyMet
4	JRP-g12	MyRailS
5	JRP-g04	ADVENT
5	JRP-g03	Biomethane
7	JRP-g18	MultiFlowMet II
8	JRP-g05	MICEV
9	JRP-g15	LNG III

EMPIR 2016 selected projects:

- Generation / carriers: PV, hydrogen, biomethane, LNG, multiphase flow
- Transport: LNG, multiphase flow
- Use / efficiency: energy-saving electronics, hydrogen vehicles, railways
- Materials: thin films

- No projects on conventional generation, storage, grids
- Cross-cutting themes (e.g. buildings) tend to fail in PRT & JRP phase
- Applied projects (bridging innovation gap) tend to fail in JRP phase

EMPIR 2016 Energy call – review (2)

Why PRTs do not become a successful JRP:

- Multidisciplinary approach required, making it difficult to write a strong proposal (insufficient cooperation technical areas)
- Practical measurement needs: insufficient research content, 'too applied' (flow, temperature, electricity; STAIR-EMPIR)
- 'Non-traditional' metrology required
- Different experience in JRP project writing between Euramet TCs ⇒ some technical areas over- c.q. underrepresented

Subjects without PRTs:

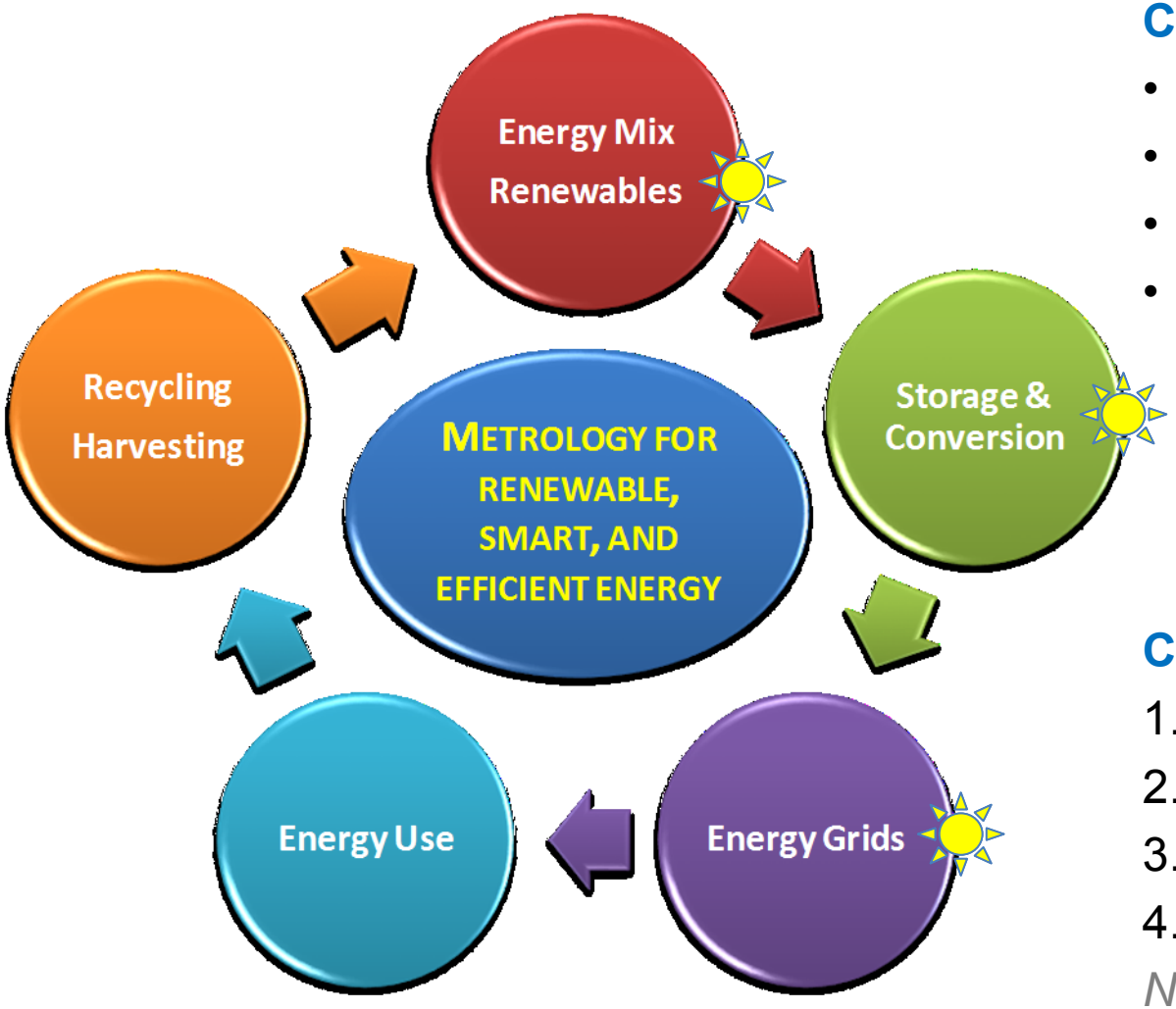
- no eminent metrology needs
- insufficiently awareness of measurement needs

2019 call: stakeholder review

Review stakeholder material ENERGY – in preparation of EMPIR 2019 Energy call –
Gert Rietveld, VSL, TG Energy Chair, version 3, 6 November 2017

1. **EU Energy Union, H2020 Energy calls 2018- 2020**
   ⇒ Energy efficiency & global leadership in renewables
2. **Stakeholder workshop, November 2015**
3. **Euramet SRA**, 2016 (written in 2015)
   ⇒ Expected key outputs still relevant
4. **Overview of past EMRP and EMPIR Energy calls** (2009, 2013, 2016) – total of 31 JRPs
5. **Gap analysis**
   ⇒ Storage and conversion largely missing
   ⇒ Efficiency and non-carbon-based RES under-represented

Energy Call 2019 - Scope



Cross-cutting themes

- Efficiency
- Big data – data analytics
- Modeling
- Materials

Call Priorities

1. Efficiency
2. RES
3. Smart grids
4. Storage, Conversion

EU Energy Union Strategy

Gap analysis

NB 2016: no prioritisation!

Energy Call 2019 - Scope

2019 Energy call scope to be approved by EMPIR committee

The strategic aim of the Targeted Programme "Metrology for Energy" (TP Energy) under the EMPIR Call 2019 is to support and accelerate – through metrological research and development – the on-going Energy Transition in order to achieve a low-carbon economy based on secure, clean and efficient energy.

The TP Energy focusses on metrology R&D in four core priority areas. Three are set by the EU Energy Union Strategy: renewable energy, smart energy systems, and energy efficiency. In this way, this Call will leverage the EU efforts in complementary H2020 programmes. An additional priority is storage and energy conversion: crucial to achieve the EU energy aims but with very limited EU-funded metrology research so far.

These TP Energy priorities are aligned with the EU ambitions as set out in the 20/20/20 targets of the 2020 EU climate and energy package, as well as the even more challenging targets set for 2030.

The overarching focus should be to contribute to the central TP objective of supporting the Energy Transition towards a low-carbon, smart, and efficient energy landscape.

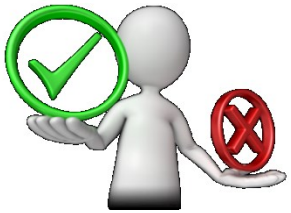
EMPIR 2019 call Energy

http://msu.euramet.org/calls.html

EMPIR Calls

EMPIR 2019 call for proposals will cover two grand challenges: Energy - Environment

(budget 20 M€ each, 9 – 10 JRPs)



Two-step process (2019)

- Submission of ideas (PRT) — Jan – Feb
- Selection of best ideas (SRT) — Apr – May
- Writing of project proposal — Jun – Sep
- Review of proposal — Nov
- Start of work (JRP) — Spring 2020

Todays Workshop

"Explore themes in energy research
where metrology can make a significant contribution"

- *Industry perspective*
  - Energy Conversion and Storage, prof. Santarelli
  - Future Transmission Grid, prof. Berlijn
  - Energy and Standardization, dr. Ganesh
- *Breakout sessions*
  - Energy mix: Renewables (wind, solar, biofuels, hydrogen), and conventional generation (carbon-based, nuclear, LNG)
  - Storage and Conversion, fuel cells
  - Energy grids (Gas, Electricity)
  - Energy use and Efficiency
  - Recycling / Energy Harvesting, Mathematics and Modelling, Big Data and Data Analytics

Summary

An Energy Transition is needed to solve the Energy 'Trilemma' and ensure a sustainable, affordable, and secure energy supply

The EURAMET Energy Metrology SRA identifies research areas where metrology can support this transition, following the Energy supply chain.

2017: start first series of EMPIR Energy Metrology JRPs

Today's networking event aims to pave the way for 2nd series of metrology energy research projects 'that make a difference'

idea!

Breakout sessions

9:00 am: start in meeting rooms

Breakout topic	Facilitator	Rapporteur
Renewable Generation (wind, solar, energy gases and biofuels) and Conventional Generation (carbon based, LNG, nuclear) – Amfi	Martti Heinonen	Lucy Culleton
Grids: Electricity & Gas grids – Room 115	Gert Rietveld	Sam Bartlett
Storage and Conversion, Fuel Cells – Room 66	Arul Murugan	Helko van den Brom
Energy Use/Consumption and Efficiency – Room 380/382	Johan Soderbom	Anne Andersson
Recycling/Harvesting; Materials and Modelling; Big Data and Data Analytics – Room 65	Marco Masoero	

11:15 am: Plenary closing session

Focus on generating ideas (brainstorm), not on in-depth discussions (no PRTs required as outcome)