



National
Metrology
Institute



Measurements for Smart Electricity Grids: Workshop “Reliable Measurements for LVDC grids and DC metering”

Helko van den Brom

16 May 2024, VSL, Delft





VSL

About VSL



- National Metrology Institute of the Netherlands
- Company with a public task
- 100 fte, 40 % MSc or PhD
- Calibrations, reference materials, R&D, consultancy, training
- Focus on energy and industry
- Located in Delft, the Netherlands



Safety first

- Slow-whoop in case of an evacuation
 - Follow the signs or VSL staff
 - Walk, don't run
 - Don't use the elevators
 - Two muster points
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- Toilets at both far ends of the building
 - No smoking in the entire building



16 May: Agenda (morning)

Time CEST, UTC+2	Item
08h30	Arrival and registration
09:00	Reliable Measurements for LVDC grids and DC metering
09:00	Welcome – Helko van den Brom
09:10	<u>Introduction</u> <ul style="list-style-type: none"> The European Research Project DC Grids: Overview – Helko van den Brom, VSL, Netherlands The role of DC for modern utilities – Jorge Sánchez, ENDESA, Spain
09:50	<u>Project outcomes I</u> <ul style="list-style-type: none"> Trigger mechanisms to detect DCPQ events and distortions – CIRCE, Universidad Zaragoza, Spain On-site measurements in LVDC grids – VSL, Netherlands
10:30	Coffee break
11:00	<u>Project outcomes II</u> <ul style="list-style-type: none"> Test waveforms for DC PQ analysis tools – University of Strathclyde, Glasgow, UK Measurement of DC voltage ripple in laboratory environment – LNE, France AC ripple over DC: new solutions for measurements and calibration – INRIM, Italy
12:00	Lunch

16 May: Agenda (afternoon)

12:00	Lunch
13:00	<u>Project outcomes III</u> <ul style="list-style-type: none"> • DC power and energy and DCPQ reference systems with distorted signals – METAS, Switzerland • Superposing DC and AC signals for testing DC meters – PTB, Germany • Power Quality Compatibility Levels in DC power networks – University of Campania, Italy • JRP DC grids input to standardization activities on DC metering and DC grids – EDF, France
14:20	Coffee break
14:40	<u>External presentations</u> <ul style="list-style-type: none"> • Advanced DC Electricity Meter Testing and Standards – Henri Schouten, NMI Certin, Netherlands • DC/DC Converters for MVDC grids – Bruno Lefebvre, SuperGrid Institute, France • Shift to Direct Current: overview of a HORIZON 2023 project – Hugo Morais, University of Lisbon, Portugal • Transducers and energy meters in DC grid applications – Yihui Zuo, LEM, Switzerland*
16:00	VSL lab tour
17:00	End of day and drinks

Thursday 16th: dinner (optional)

■ 18.30 Dinner

- At the heart of the Delft city center restaurant 'Rossio' is located. It offers a tasty menu with a wink to the Spanish and Portuguese cuisine.

Location:

Oude Delft 78
2611 CD Delft

Time:

18:30

- A group reservation has been made.
Please note this is an optional activity at your own cost.
- Please leave your name on the sign-up list.

