

Microgrid Prospects in Finland: LUT's contribution

Dr. Gonalo MENDES, Assoc. Prof. Samuli HONKAPURO,
Dr. Salla ANNALA, Prof. Jarmo PARTANEN

Background

- Finland is EU's 5th largest country, but also its least densely populated one
- 2/3 of the distribution grid consist of overhead lines located typically within forests
- Severe Winters increase the rural SAIFI and SAIDI to values 7x higher than in urban areas
- Electric heating demand creates a 50% gap between winter and summer capacity peaks

Opportunities:

- Fully deregulated and competitive market for electricity, and unbundling of service operations
- Universal smart metering, already used for electricity market balance settlement
- Amendment of the Electricity Market Act mandates highly demanding reductions in the duration of weather-related service interruptions (max outage duration 6h urban / 36h rural)
- LUT is Finland's major center for energy R&D
- The Laboratory of Electricity Markets and Power Systems (LEMPS) is dedicated to research excellence in a variety of energy topics

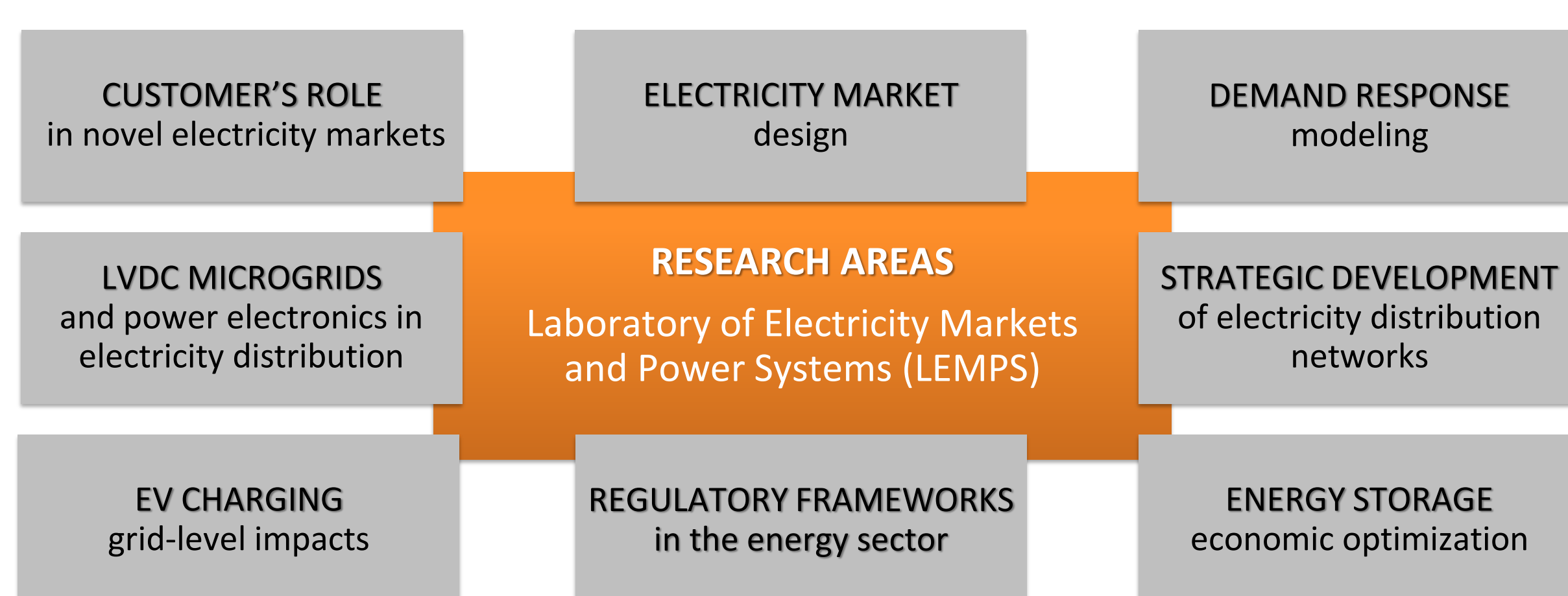


Figure 1. Main research focus areas at LUT LEMPS.

Research infrastructure

- LUT has co-developed a number of pilot and demonstration activities together with its partners

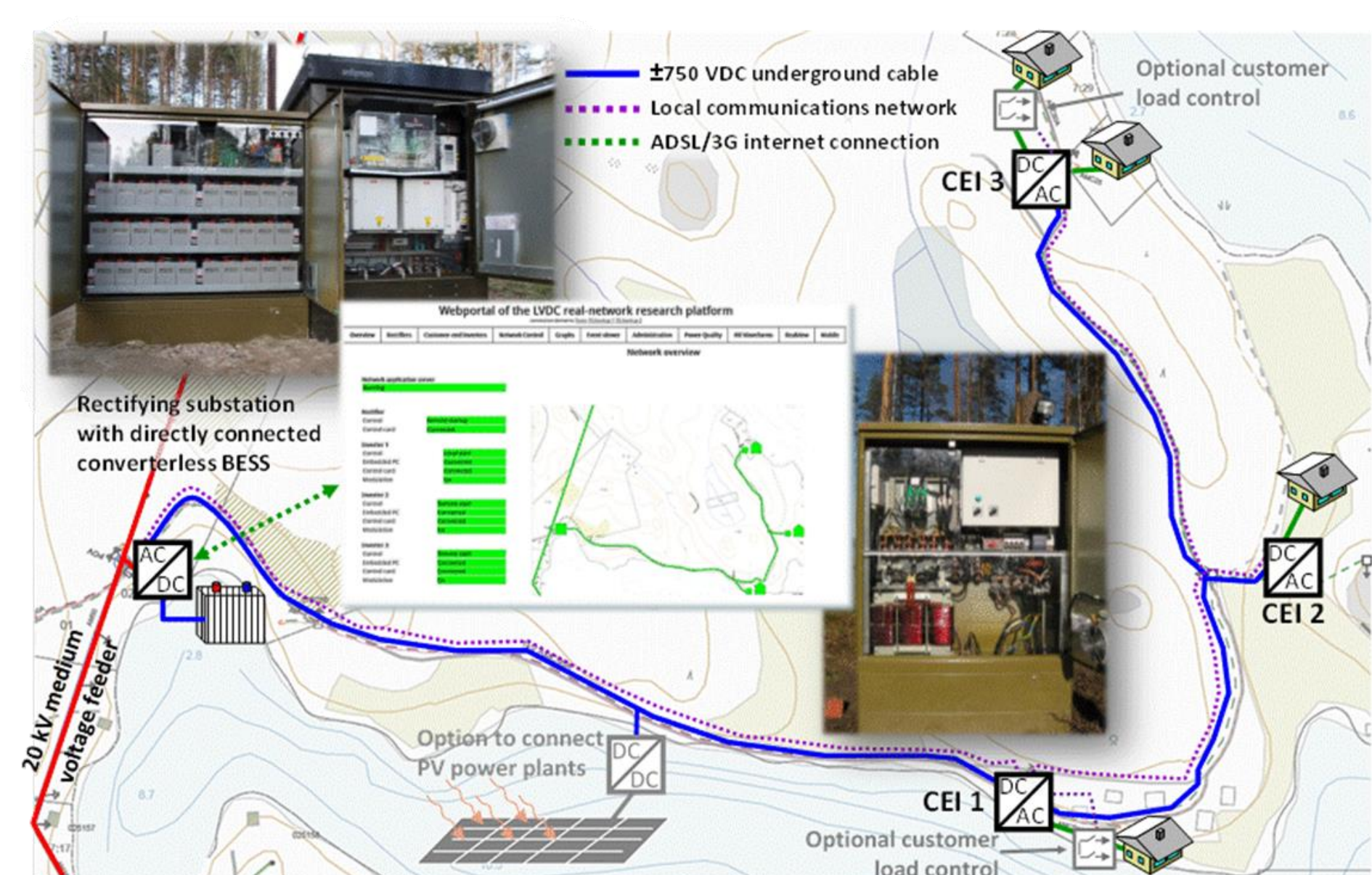


Figure 2. LVDC public microgrid site.

- LVDC public microgrid site with DSO Suur-Savon Sähkö: 60 kWh BES, 10 kW PV, DSM readiness, remote control and supervision
- Internationally-awarded Green Campus: a living lab for sustainability and a real-life microgrid test facility, combining the use of various DER

New R&D directions

- Novel policies and regulations to enable market participation and commercial growth of microgrids
- EU project DOMINOES looks at development of BMs for P2P trading-based local energy markets

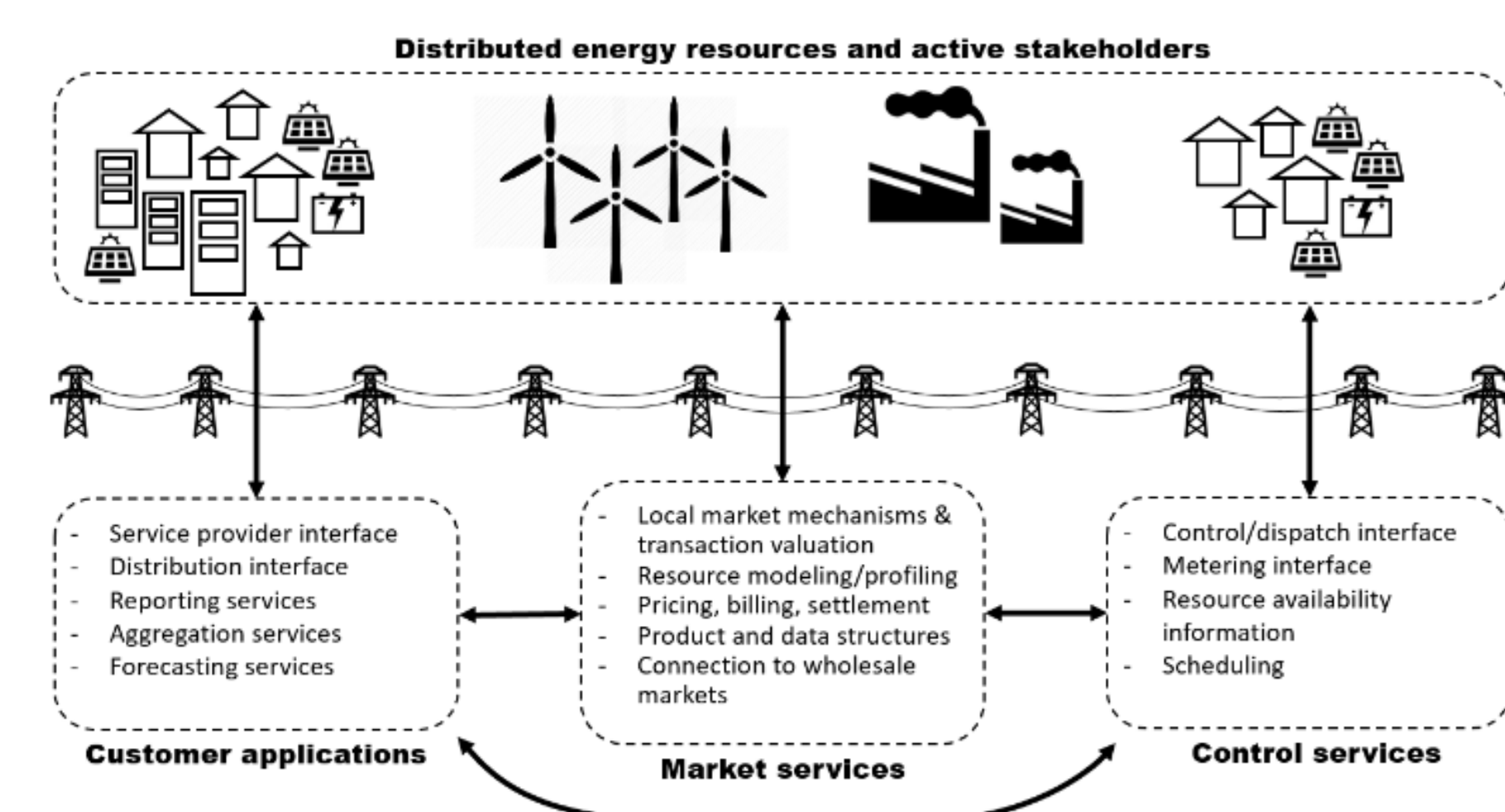
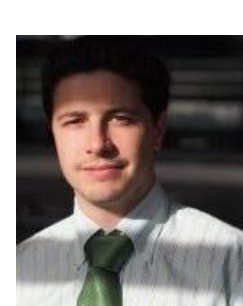


Figure 3. Local energy market concept (DOMINOES).

CONTACTS:



Gonalo MENDES
goncalo.mendes@lut.fi



Salla ANNALA
salla.annala@lut.fi



Samuli HONKAPURO
samuli.honkapuro@lut.fi



Jarmo PARTANEN
jarmo.partanen@lut.fi

ACKNOWLEDGEMENTS:

- DIGI-USER: LUT Cross-disciplinary R&D Platform
Stream 1 – Smart Energy Systems
- DOMINOES H2020 EU-funded Project

