IEA-workshop EGRD-group
Lysaker 3-4 June 2015

EMPOWER

Local Electricity Retail Markets
for Prosumer Smart Grid Power Services

This project has received funding from the *European Union's Horizon 2020 Research and Innovation programme* under Grant Agreement No 646476.

- **Topic**: Modernising the European electricity grid: LCE 7 – 2014: Distribution grid and retail market
- **Call**: Competitive Low-Carbon Energy
- **Duration**: Jan 2015 – Dec 2017
- **Total PMs**: 431
- **Budget**: €6.12 mill. (total costs) €4.43 mill. (EU grant)
- **Members of the consortium**:

Smart Innovation Østfold AS (NO)
Schneider Electric Norge AS (NO)
eSmart Systems AS (NO)
Fredrikstad Energi Nett AS (NO)
University of St. Gallen (CH)
Universitat Politècnica de Catalunya (ES)
Malta Intelligent Energy Management Agency (MT)
NewEn Projects GmbH (DE)

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Expected Technical Impact

Development of a complete new energy market where consumers can buy and sell «neighborhood energy» which is produced locally by solar panels, micro wind turbines and other de-central energy production, new market design and new business models will be tested in Malta, Germany and Norway.

- *Relieve the central and regional grid, balance distribution grid locally*
- *Increase local electricity production and cheap renewable electricity to the customers*
- *Store electricity locally in battery stations and electrical vehicles*

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3 pilot sites

What is the background for

?

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Expected impact related to policy, business models, regulatory aspects, etc.

In the future,

most of the energy we use

will be produced where it is used.

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Expected impact related to policy, business models, regulatory aspects, etc.

On average 80% of all energy use

in residential and office buildings

will be covered by local energy production.

Central power supply will only be used

as a reserve.

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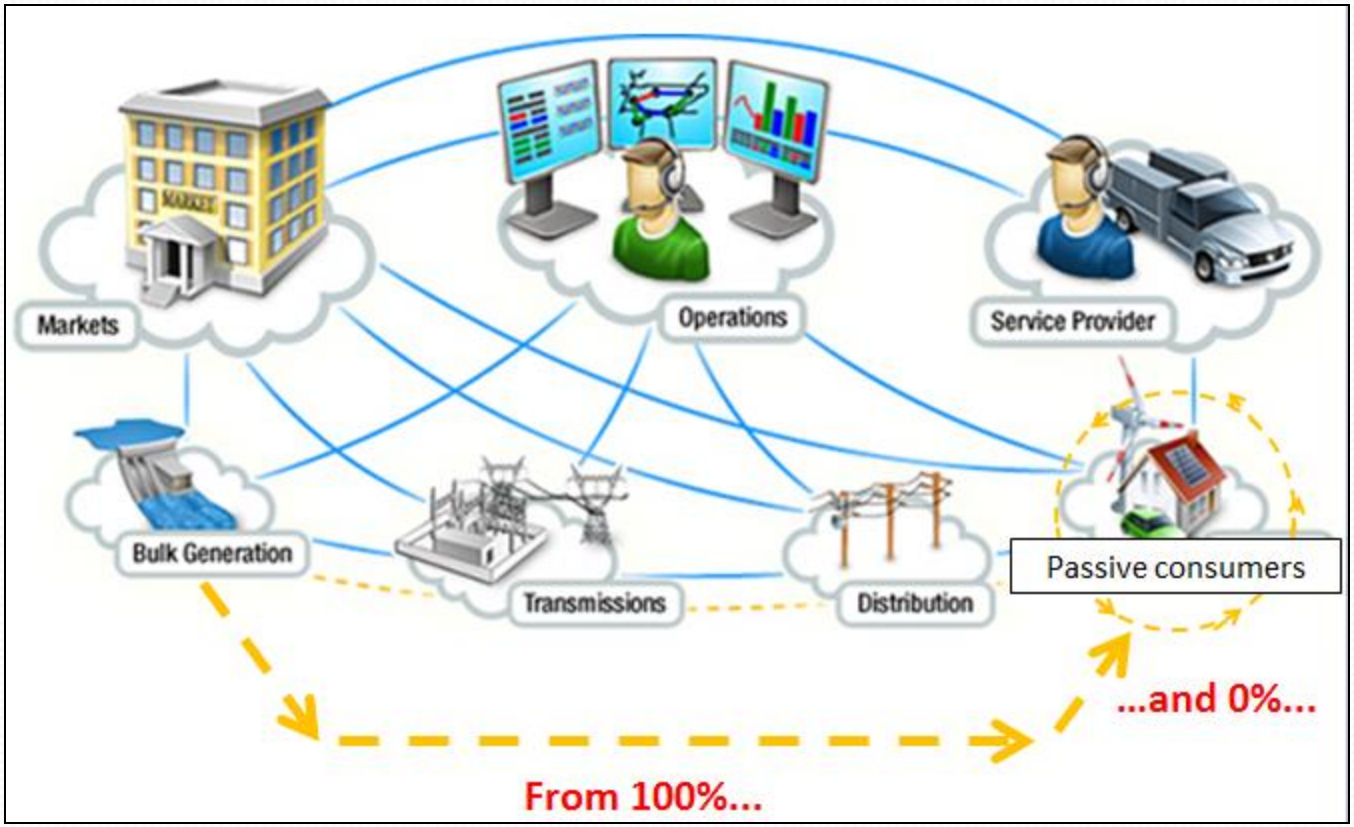
Expected impact related to policy, business models, regulatory aspects, etc.



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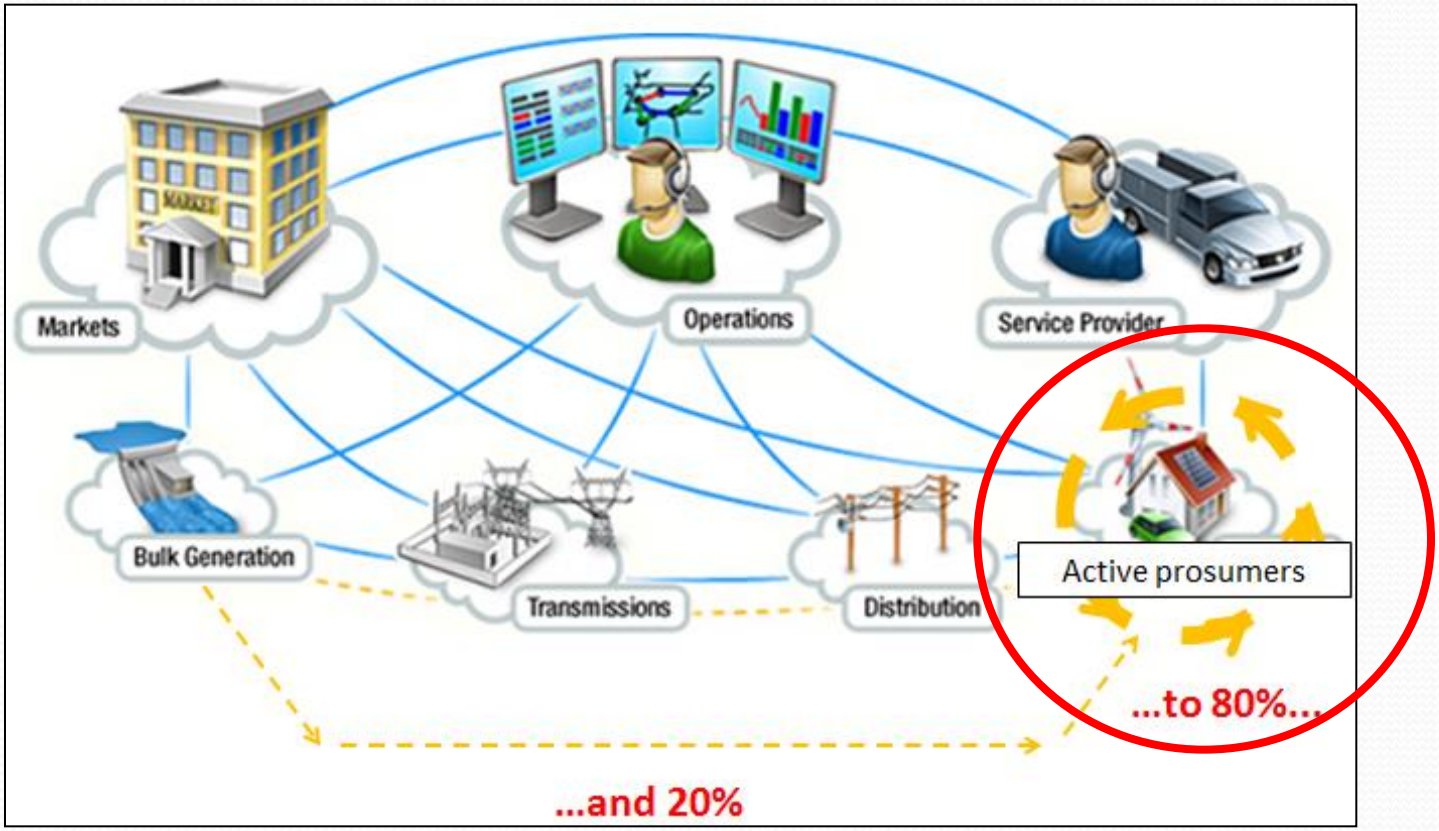

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Expected impact related to policy, business models, regulatory aspects, etc.

What does it mean for a DSO

to loose 80% of their grid rental charges ?

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Expected impact related to policy, business models, regulatory aspects, etc.

Decentralized renewable energy production

and storage

will soon revolutionise the energy sector.

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Expected impact related to policy, business models, regulatory aspects, etc.

New roles in the energy market:

prosumers, aggregators, ESCOs, …

Many new business models.

Energy companies will have to adapt

- or get swallowed by their competitors.

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Why Tesla's battery for your home should terrify utilities

Elon Musk's electricity empire could mean a new type of power grid

http://www.theverge.com/2015/2/13/8033691/why-teslas-battery-for-your-home-should-terrify-utilities

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SolarCity

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SolarCity

- Tesla founder Elon Musk is chairman of the board of the SolarCity company.
- SolarCity is building a giant factory for battery production where the main market is not EVs, but storage of electricity produced in homes and office buildings.
- The goal is that the batteries shall cover energy consumption for a whole week.

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SolarCity

- SolarCity has a pilot project with 500 private homes in California.

- 10-kWh Tesla battery packs are used which can supply a home with electricity for about two days during blackouts.

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SolarCity

"SolarCity installs panels on people's roofs, leases them for less than they'd be paying in energy bills, and sells surplus energy back to the local utility. It's proven a tremendously successful model. Founded in 2006, the company now has 168,000 customers and controls 39 percent of the rapidly expanding residential solar market."

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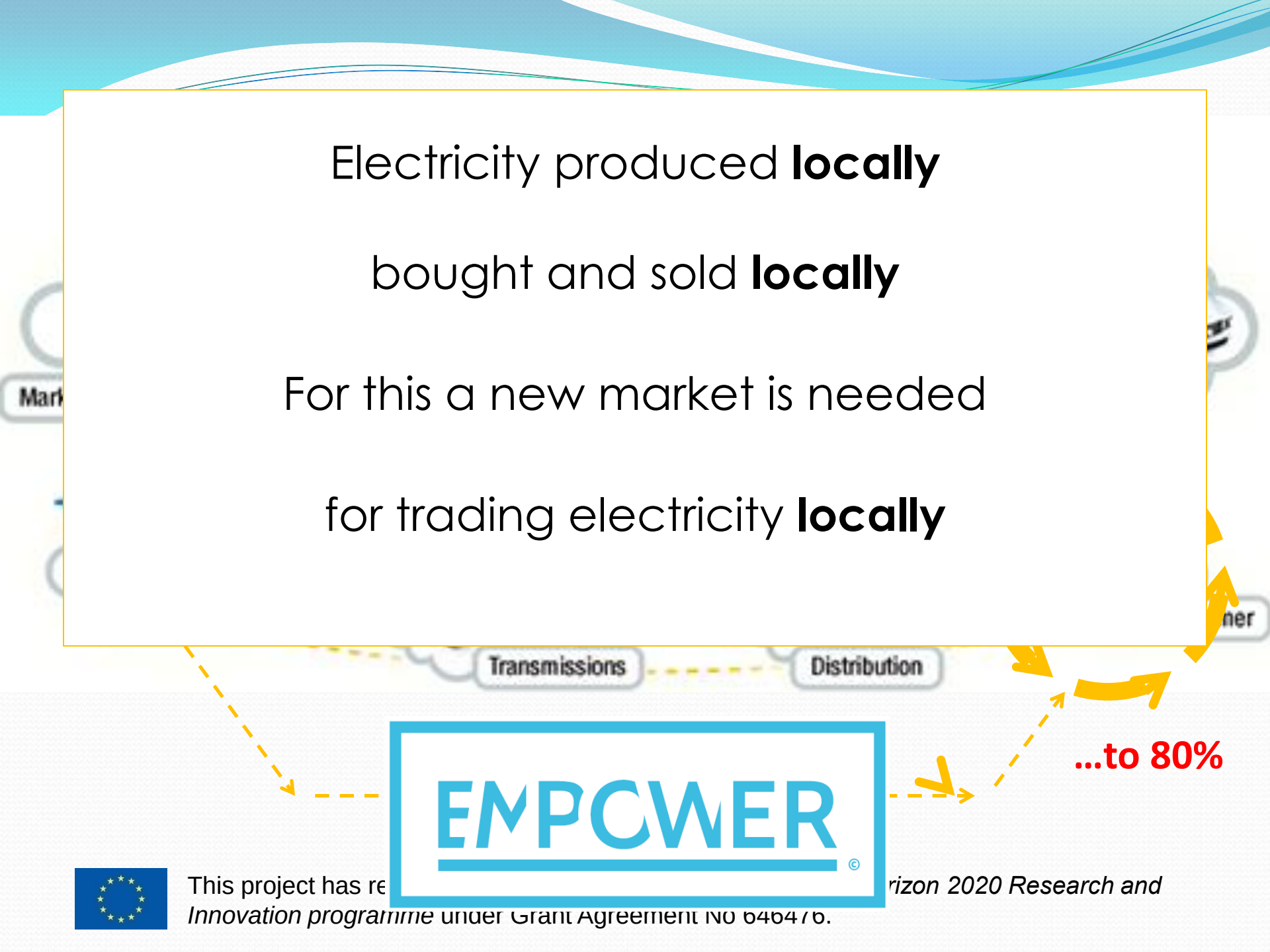
Electricity produced **locally**

bought and sold **locally**

For this a new market is needed

for trading electricity **locally**



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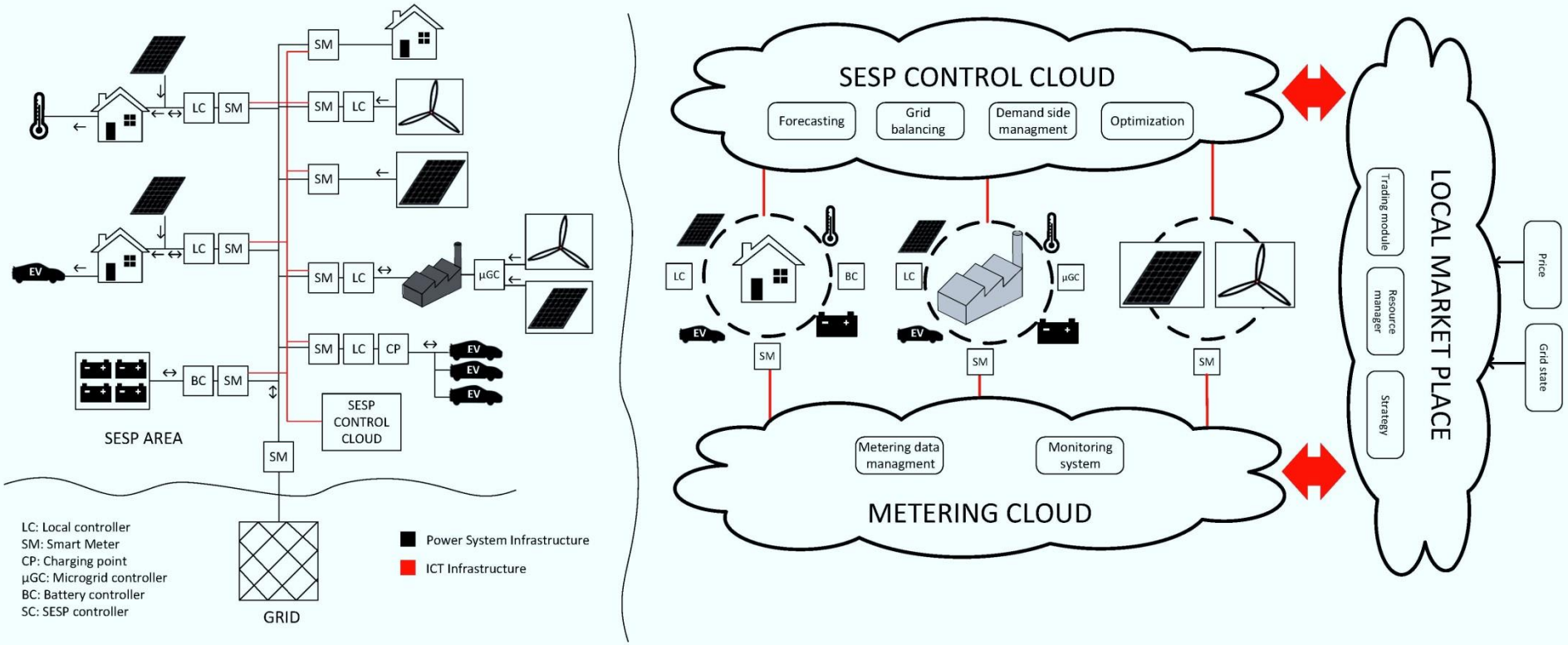
New local market model



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Potential barriers/obstacles to innovation

- Energy monopolies will fight for their market dominance
- Differences in national regulations may delay decentralized energy market development
- Consumers need to understand the benefits of becoming prosumers – strong incitements are needed
- Cybersecurity in SmartGrids and privacy of prosumer data have to be guaranteed
- Interoperability and standards are needed to guarantee free competition among suppliers

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Prosumers in the centre

Hvaler, May 2nd, 2015

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NCE NORWEGIAN CENTRES OF EXPERTISE Smart Energy Markets