

Datahubs as enablers for local energy markets

Jan Segerstam

Development Director, Empower, Finland



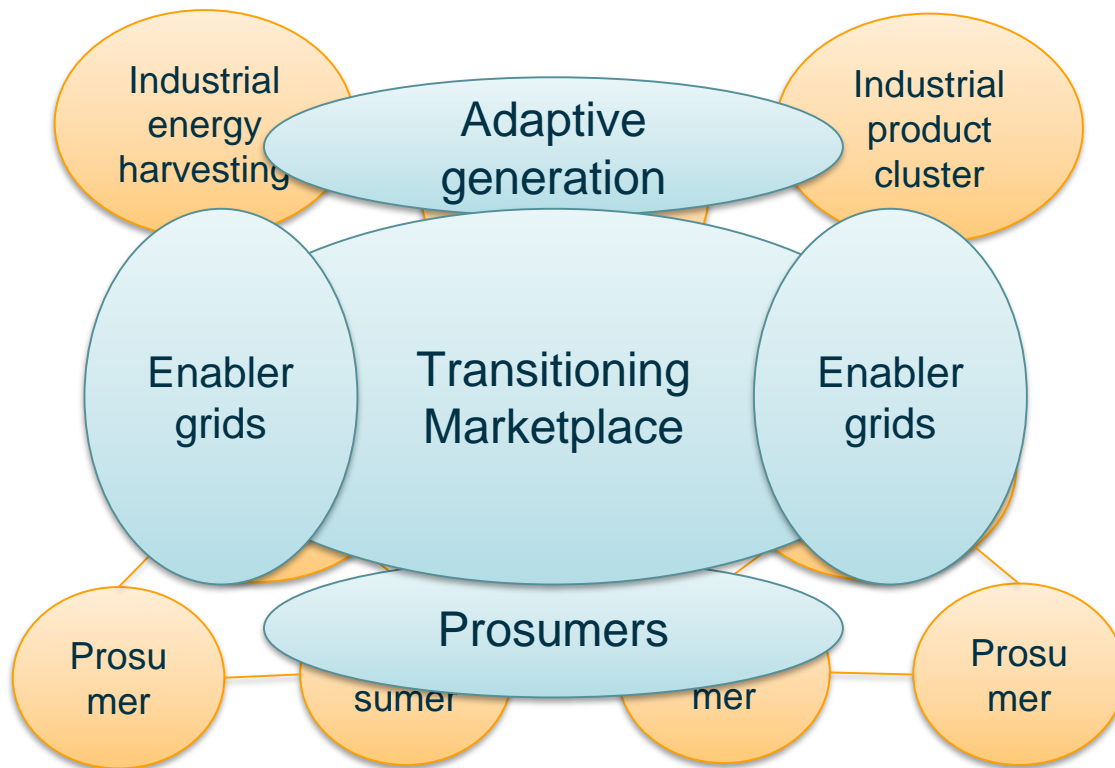
Who's talking?

- Jan Segerstam
 - Development Director, Empower Energy Intelligence
- DOMINOES, a joint European H2020 consortium project lead by Empower
 - Building a scalable and sustainable market model for bridging local and already functioning energy markets
- Empower, a Nordic service provider building digital solutions for energy, telecom and industry
 - Enabling over 100 utilities, services ranging from BPO to ICT systems and 24/7 grid & generation management

Energy Markets

- European Energy Markets have evolved since liberalization
 - Some markets are well over 20 years into free market mechanisms from wholesale to retail energy
- Cross-border markets have grown
 - Nordic market functionalities now cover everything from financials and physical products down to settlement
 - Retail mechanisms are converging with regional hubs

Our Future Energy System



Energy is extracted from renewable sources by prosumers and industrially managed sites like wind/solar farms close to controllable loads and connected to dynamic groups to balance needs and overproduction

Network costs are balanced across shared infrastructure and dynamic groups based on actual network needs

Regulation opens access to common infrastructure and allows distributed allocation of resources while promoting open markets on all levels

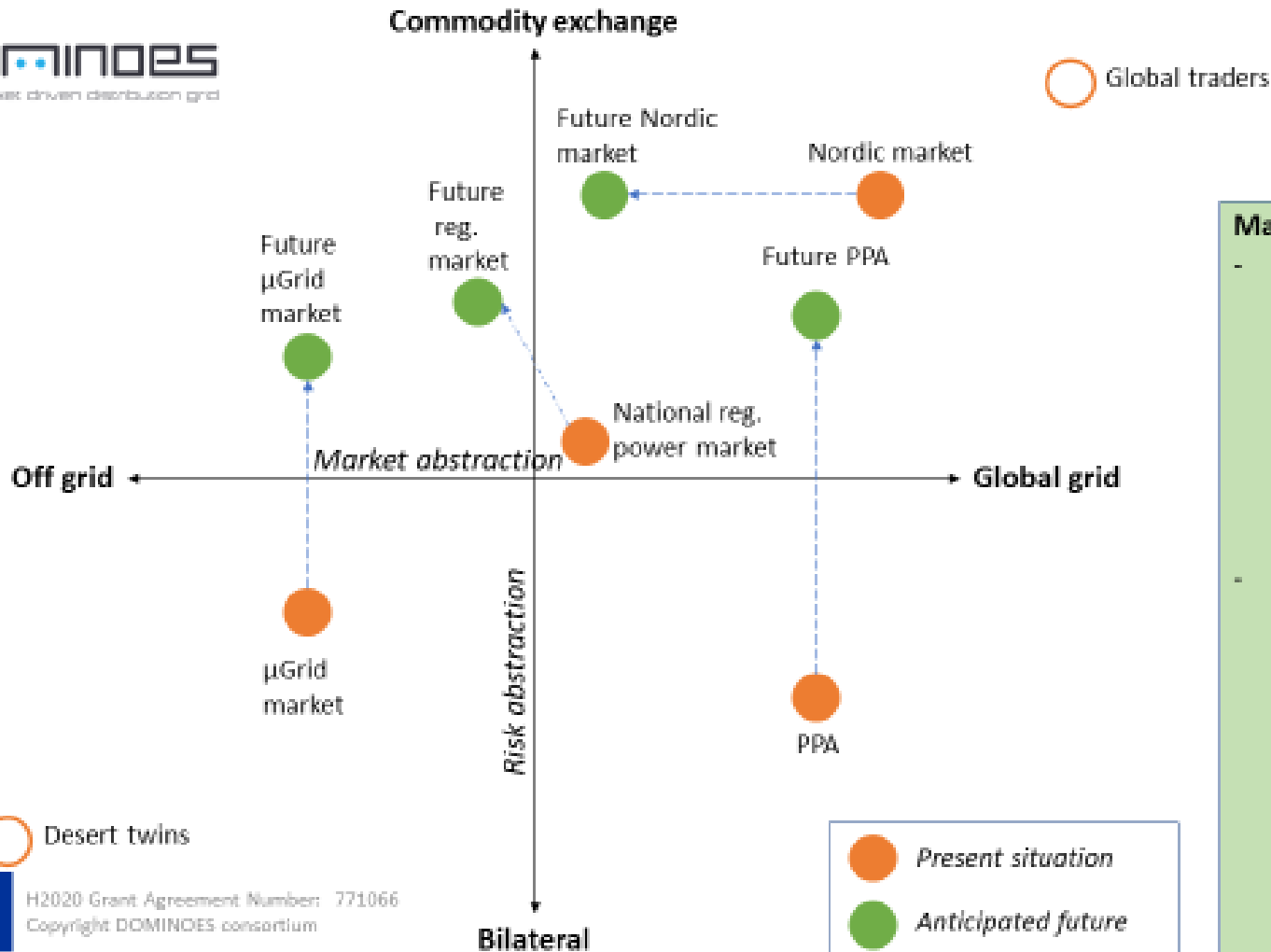
Electric mobility left out for clarity

Market Models

- Challenges arise when distributed resources and capabilities meet a market mechanism designed for a different infrastructure
- Resources being built now are distributed and bring benefits to smaller groups of participants at a time
- Traditional market models have grown out of a necessity to divide up large resources between a large number of customers and providers

Markets are evolving

dominoes
market driven distribution grid



Market scenarios

- Two extremes: desert twins (no connection to even regional networks/markets) <-> global traders (one common exchange, opportunity to trade any product globally)
- Need to get from "current" (i.e. inexistent) microgrid market to a future microgrid market where trade compatibility and system access guarantee liquidity



H2020 Grant Agreement Number: 771066
Copyright DOMINOES consortium

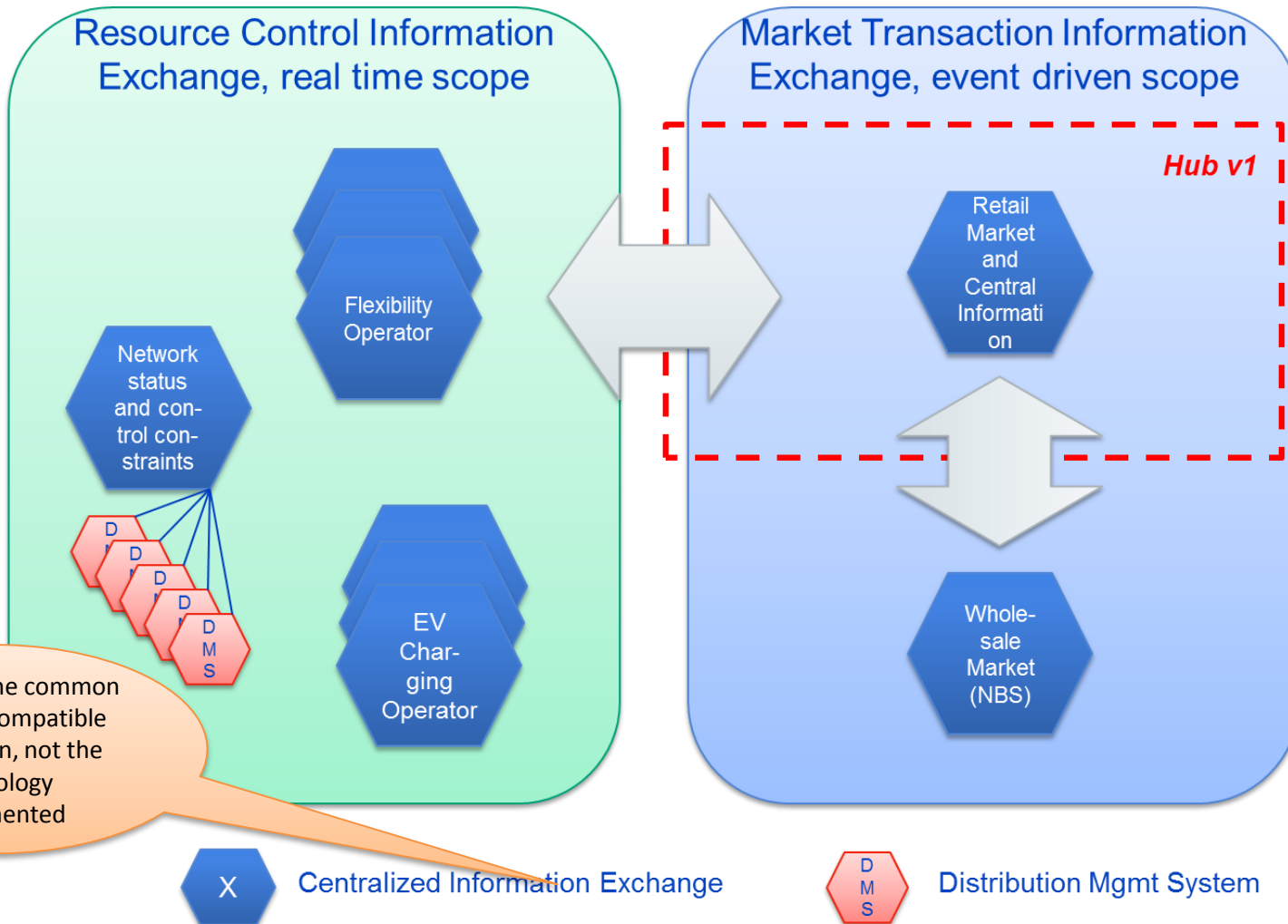
Local Markets

- New open and interacting local markets create a new kind of resource that can enable better distribution of value and incentives
- Traditionally a local market has simply been an exchange of services and monies between physically close participants on a small scale, not open to outside interaction

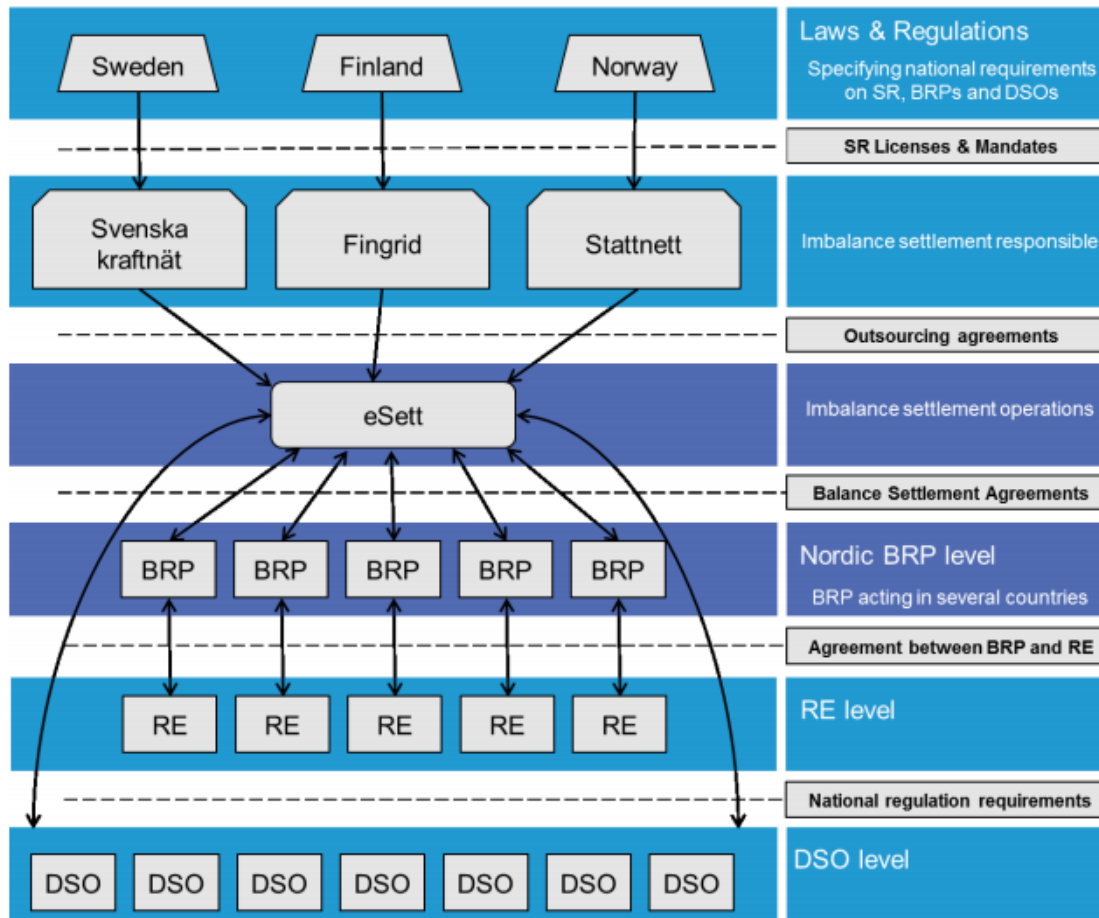
Datahubs

- Traditionally datahubs have meant huge systems with databases of information
- Hub thinking is moving towards service oriented enabling of markets
- Service enabling hubs with unified data access capabilities for authorized parties are being built

Finnish Datahub Vision 2014



Nordic Balance Settlement



One hub for the Nordic Countries

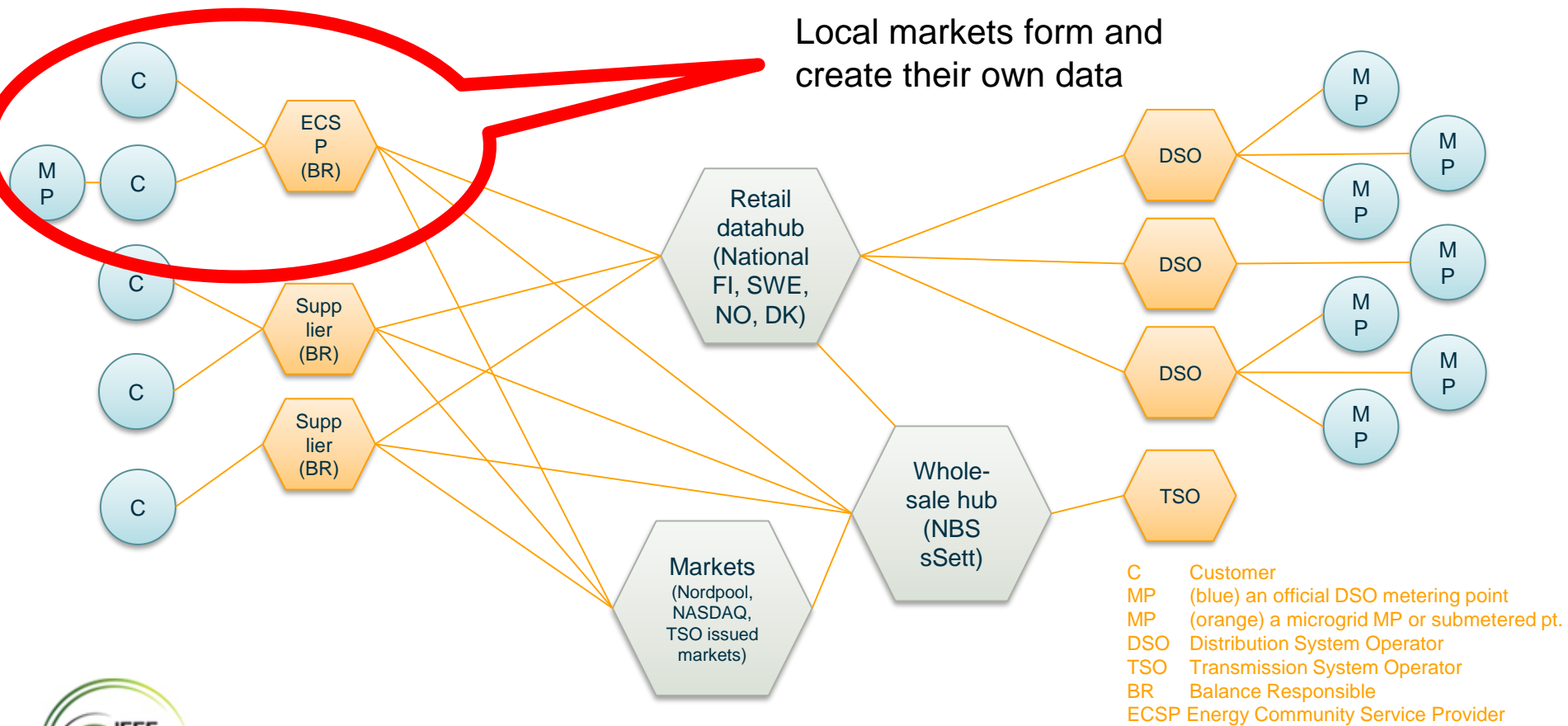
Denmark joins later

National hubs join the retail markets to the NBS

Now in use in all three Initial countries

Hub enabled market mechanisms are changing the market dynamics

Nordic Markets are converging into hub enabled and marketplace driven models
Energy Community Service Providers serve Microgrids and traditional customers



Data Models

- New data models enable dynamic combining and grouping of energy and capacity behavior in ways that allow new business to scale
- Traditional data models are rigid and based on specific assumptions of expected data model usage
- New Ontology based semantic models allow for introduction and sharing of new data

Data Management Technologies

- New mechanisms for storing and sharing data create new capabilities to enable evolving business models
 - Shared ontology implementations
 - Blockchain implementations
 - Other emerging technologies
- Sharing of business models is now possible with less resources and easier implementation

Datahubs Enabling Local Energy Markets

- Datahubs are a tool and are technology independent
 - Regardless of technology, a ruleset of receiving, validating, providing, defining access to and disseminating data is needed for a market to be able to handle transactions and their base information
- Datahubs create these capabilities to be exploited by any entities wishing to have a market
 - By having compatible and shared structural and transactional information, the openness and interactional capabilities of the local markets are ensured
- Datahubs do not mean single point databases



H2020 Grant Agreement Number: 771066
Project material copyright DOMINOES consortium

Thank you for your attention!

Jan Segerstam, jan.segerstam@empower.eu

Visit us to learn more:

<http://dominoesproject.eu/>

www.empower.eu