DOES THE CLEAN ENERGY PACKAGE PROVIDE THE TOOLS NEEDED TO IMPLEMENT DSOs' LONG TERM VISION?

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Finnish Energy

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DSOs will save the planet if we get a chance

- Fight against climate change - electricity will supplant fossil fuels
- Consumption of electricity will increase
- More energy production, mostly renewables - wind and sun
- Greater part of renewables will be connected to DSO grids
- DSOs will play a significant role
- The role of the DSO will grow also at customer level
- New tasks for DSOs

- but

- **DOES THE CLEAN ENERGY PACKAGE PROVIDE THE TOOLS WE NEED**

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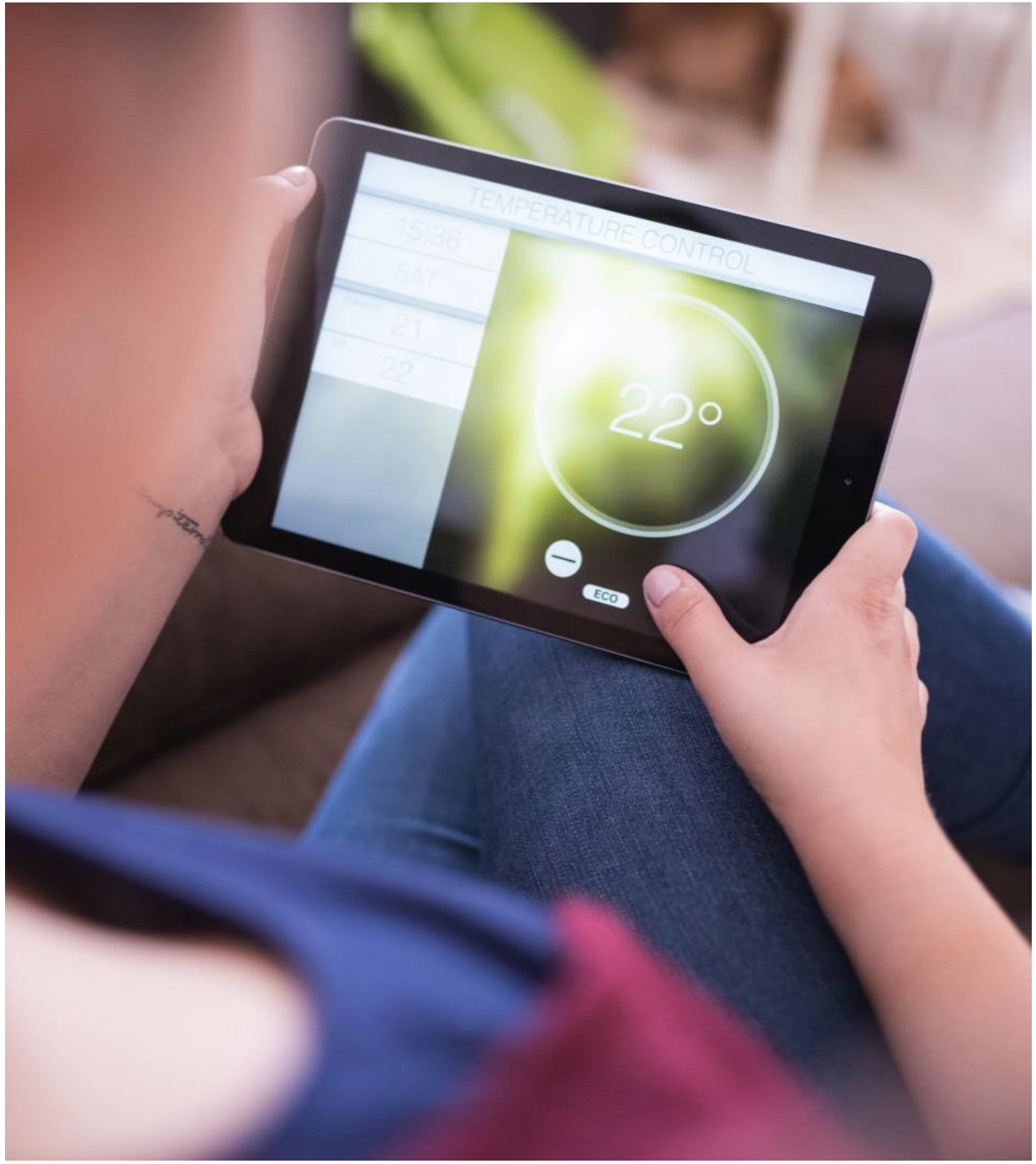


Believe it or not, Finland is the world's happiest country 2018

Chris Pash | Business Insider Australia | Business Insider Nordic 15 Mar 2018 10:59 AM 18069

Aurora borealis in Northern Finland.

Nordic countries take four out of the five top spots, and are well known to be stable, safe and socially progressive. There is very little corruption, and the police and politicians are trusted.

World Happiness Report READ THE REPORTS

MARCH 20, 2019

Finland Again is the Happiest Country in the World

Now you have to believe!

For the second year in a row, Finland has been named the happiest country in the world by the World Happiness Report. What's more, the Nordic nation has pulled "significantly ahead" of the other top 10 countries in the report, which ranks the happiness levels of 156 countries using data from Gallup World Poll surveys.

Facts about Finland

- 5,5 million happy inhabitants
- Area 338 000 km^2
- 17,6 inhabitants per square kilometer
- High energy consumption per capita
  - high share of manufacturing industry, EU's coldest Member State, long distances inside the country and to the EU and other markets – "Finland is an island in the northeast corner of the Europe"
- High energy efficiency in buildings (triple windows etc.)
- Electricity consumption 80...90 TWh/a
  - 3.4 million metering points
- District heat consumption 30...35 TWh/a
  - 2.7 million people living in district heated buildings

Finland has 77 distribution system operators

Average outage time
0.0/6.0 h/year

Network length per customer
16/440 m/customer

Underground cabling rate
1.5/99.8%

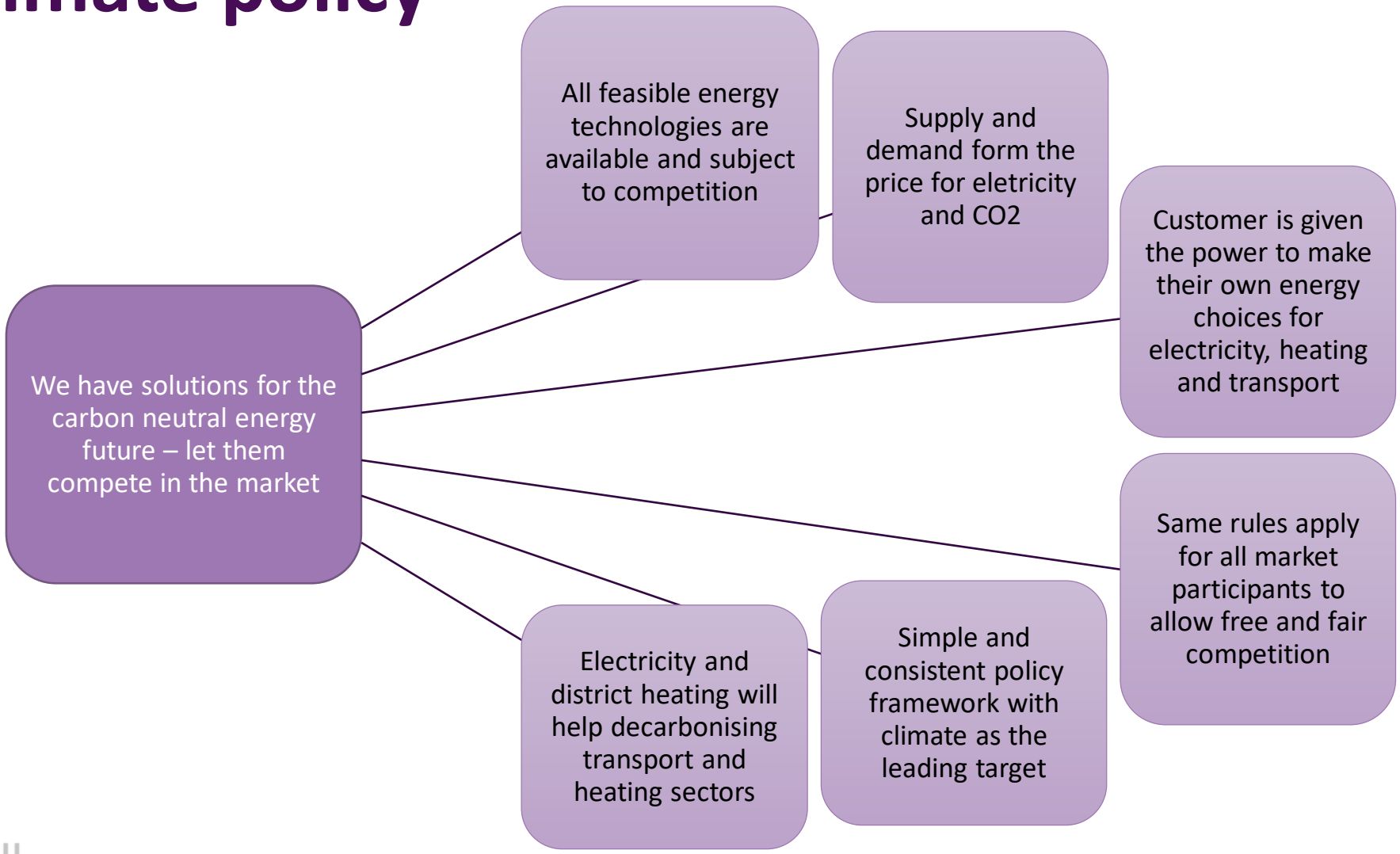
Network investments
EUR 150,000/230,000 000/year

Number of customers
750/660,000

Network length
140/80,000 km

Transmitted energy 20/10,000 GWh/year

Finnish Energy principles for the EU energy and climate policy



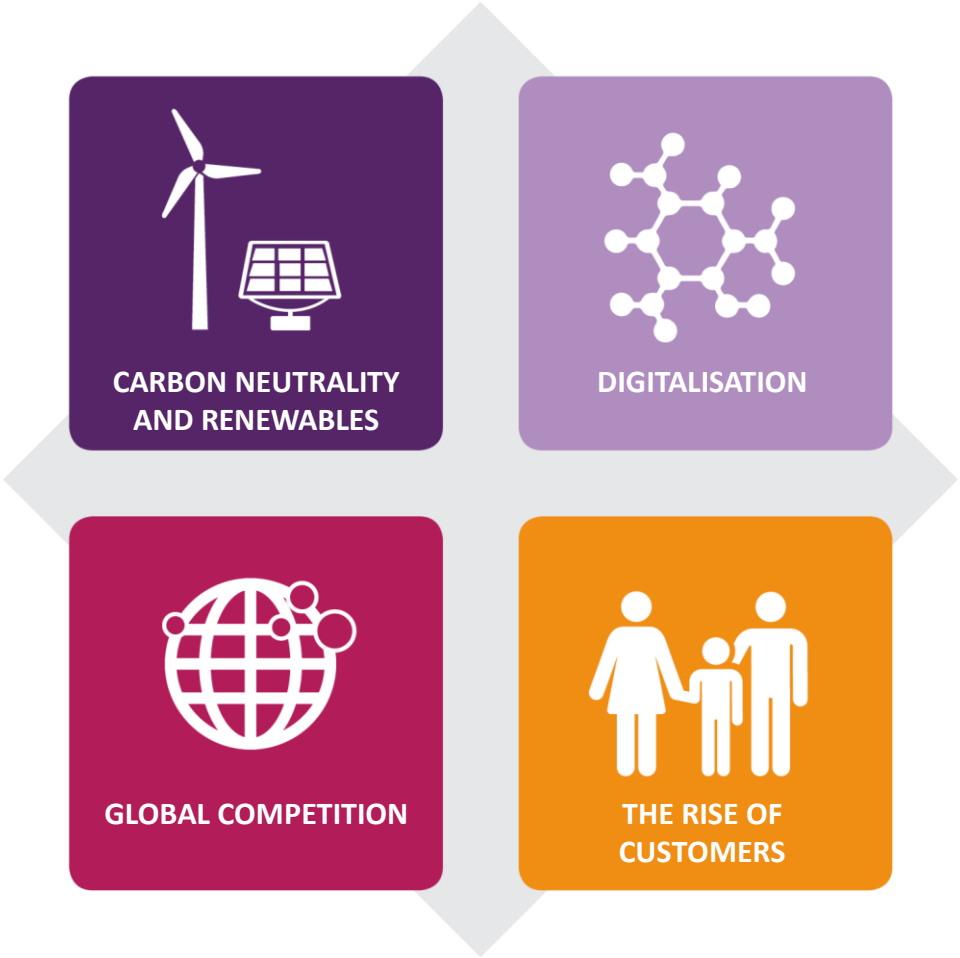
Big changes

Carbon neutrality and renewables

"Challenging because investments are made in the long term, but the operating environment changes rapidly."

Global competition

"A market viewpoint – we must think that competition is in society's interests. There are markets of different sizes, not only the domestic market in Finland."



Digitalisation

"For how long will the energy companies dominate the field? Major ICT companies are coming."

"New technological innovations change the disciplines."

The rise of customers

"The customer's role increases."

"..demand more: information, they are well-informed, they want to know about emissions, to do things independently. This will become more pronounced."


Clean Energy Package
What does in mean for the DSOs?

CEP Goals in a Nutshell

- Boost wholesale market flexibility as well as in the grids
- Provide clear price signals to the market and to the consumers
- Ensure and promote investments
- Enable consumers participation in the energy market –active consumer
- Enable technology progress for consumers benefit

Electricity Market Design: DSO perspective

- **Encourage DSOs to innovate** – and not take away important means and instruments
- Enable DSOs to **use all flexibility options**, including storage as a regular network asset
- Ensure **DSOs' access to all necessary data** & maintain data formats already in place at Member State level
- Respect the diversity of **national distribution tariff structures**
- **DSO Entity**: an effective and operational European framework for the EU DSO entity
- **Match DSO/TSO** responsibilities on network codes and data management;

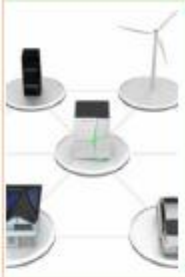
Finnish

European Commission

Storages - yes or no or yes

- Art 42 a
  - Network operators should not own, develop, manage or operate energy storage facilities.
- Art 42 b
  - Where energy storage facilities are fully integrated network components not used for balancing or congestion management, they should not be subject, under the approval of the national regulatory authority, to the same strict limitations for network operators to own, develop, manage or operate these facilities.

Flexibility services



Allow & Incentivise **DSOs to procure flexibility services**

Market Based Procurement
All Flexibility Resources
Distributed Generation,
Storage, Demand Response

Flexibility Services shall cost-effectively **replace investments in electricity capacity**

DSOs shall **define specifications & standardised market products** for the services procured

Member States to define an **adequate remuneration for DSOs** to recover reasonable costs

Art. 32

MSs shall provide the necessary regulatory framework to allow and incentivise distribution system operators to procure flexibility services, including congestion management in their service area,…

DSOs as users of demand response

- Finnish distribution networks are strong
  - No need for general market restrictions due to distribution bottlenecks
    - Studies indicate situation will remain despite the rise of EV and micro generation
  - Possible rare and momentary local bottlenecks must be resolved in a way that doesn't limit the operation of the market
  - DSOs have the right to control customer loads in certain exceptional circumstances
    - power shortage, planned outages for maintenance, network faults…
- Investments in the grid cannot be postponed on a large scale through demand response
  - Would require load controllability whenever necessary
    - Participation in demand response is optional for the customer
  - Delaying strengthening of the network may be possible in some cases
    - Benefits from demand response in terms of network investments remain minor
  - No direct demand response contracts between DSO and customer
    - DSO purchases demand response actions for the continuous management of its network, from market actors

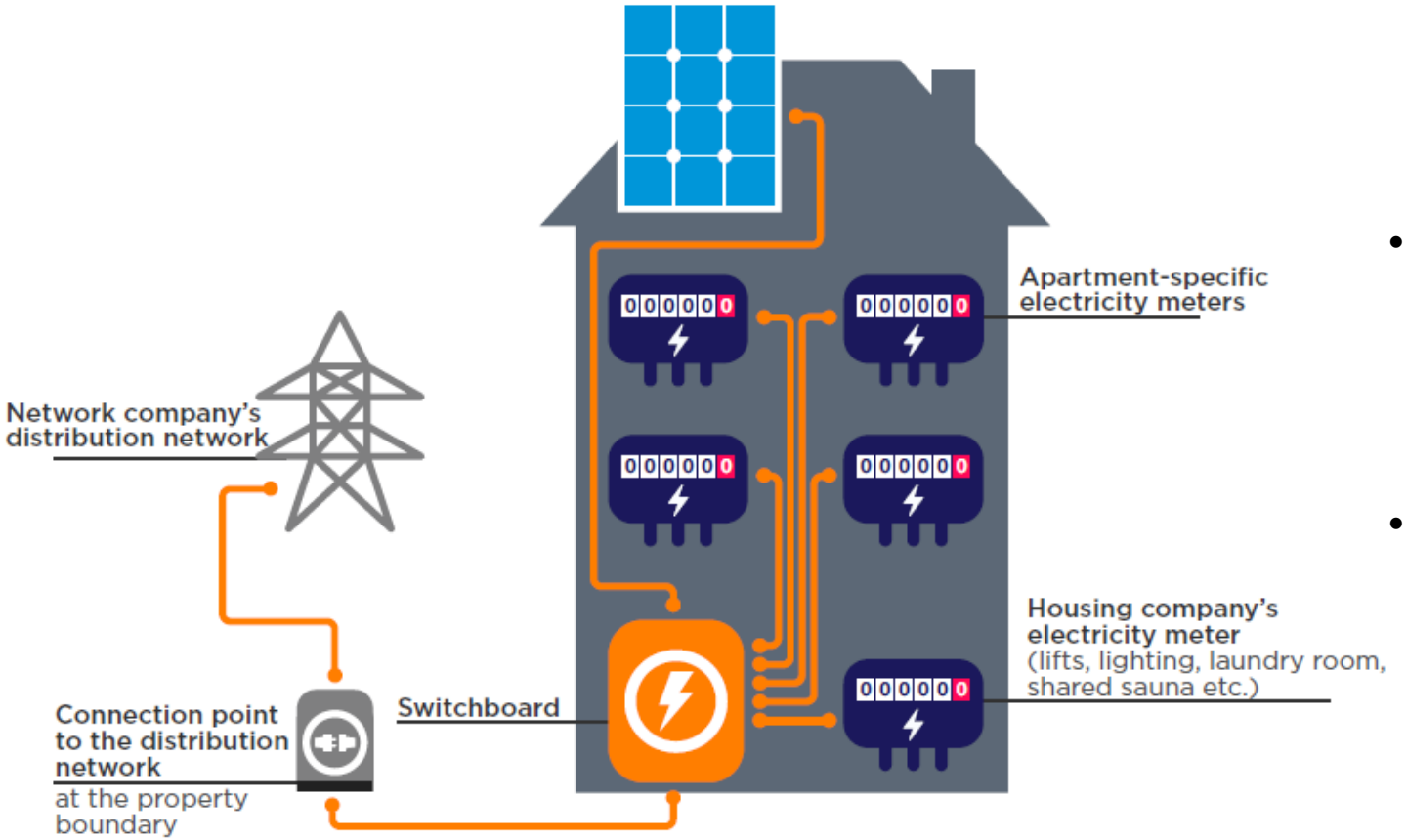
DSOs as a verifiers of customer behaviour

- DSO has a central and important role as the implementer of metering and balance settlement
  - Responsibility for the metering and balance settlement in accordance with legislation
  - Metering data can verify customer behaviour on hourly level
- Smart metering fully implemented
  - Electricity consumption already monitored hour by hour
  - Data utilised in the balance settlement between suppliers
  - Costs incurred by electricity usage e.g. for peak-priced hours are allocated fairly
- The DSO can support the uptake and development of market-led demand response
  - Participating in the research, piloting and implementation of systems designed for the management of demand response services as the markets evolve

Citizens‘ Energy Communities

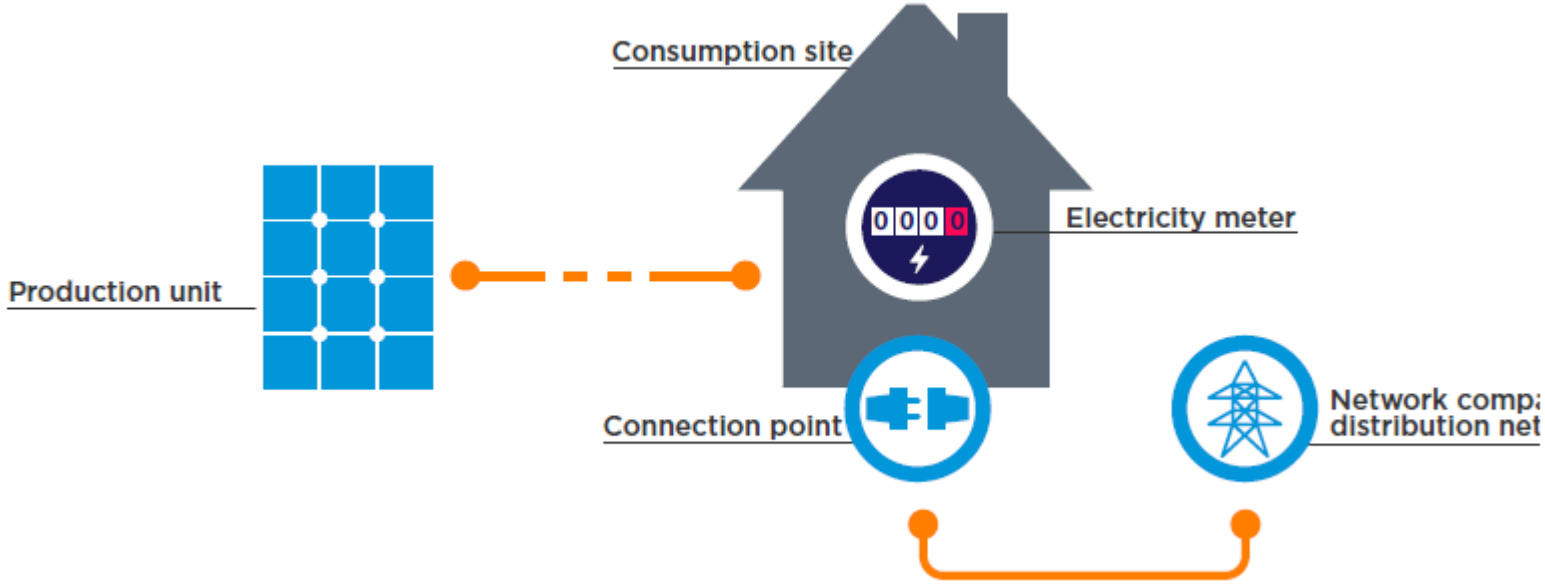
- Member States to provide enabling regulatory frameworks for CECs
- Level playing field -access to all electricity markets
- Share energy & local renewable energy among CECs
- MS “may” allow CECs to own, establish, purchase or lease and manage distribution networks
- Obligations related to networks & charges
  - Must fulfill all rules and regulations -just like DSOs
  - Contribute adequately to network costs / fair and cost reflective network charges
  - Financially responsible for imbalances
  - Sharing electricity without prejudice to applicable network charges, tariffs and levies
  - Separate network charges for electricity fed in / consumed

Citizens' energy community - within a housing company



- No network service charge should be paid to the DSO for energy generated and consumed within the property if it does not cross the access point to the distribution network and consequently does not pass through the distribution network.
- Electricity taxation to be implemented according to current taxation practices.

Citizens' energy community - crossing property boundaries



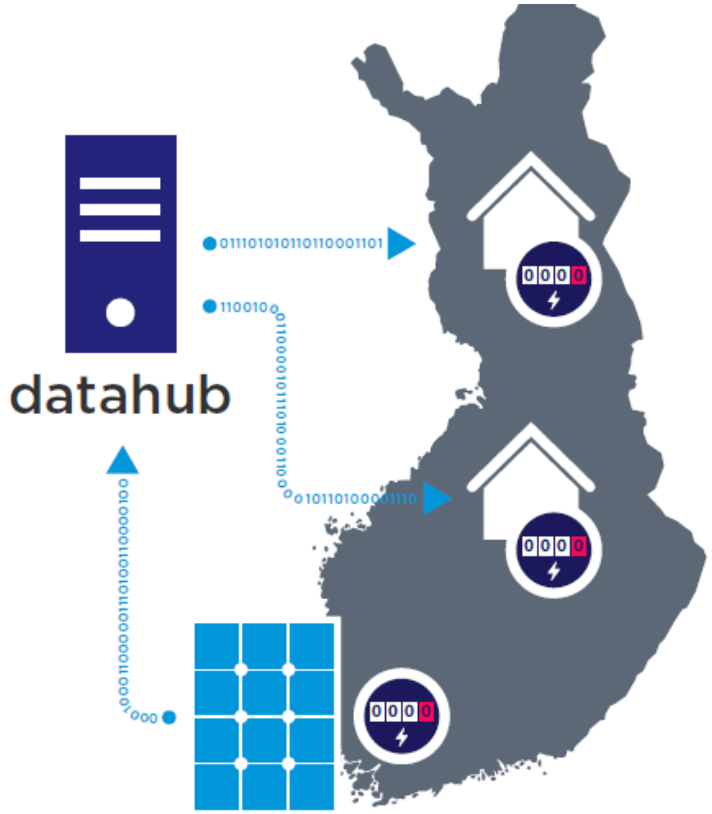
- The construction of a power line across the property boundary to connect a small-scale generation site to the consumption site should be allowed without DSO permission and without a electricity network license.
- The customer is responsible for the quality of the electricity and the electrical safety beyond the access point for the accounting point.
- To ensure electrical safety and fair treatment of customers, the connecting line must not connect accounting points to each other and it must also not form a circular network parallel to the distribution network.

Citizens' energy community – distributed/virtual

= generation site

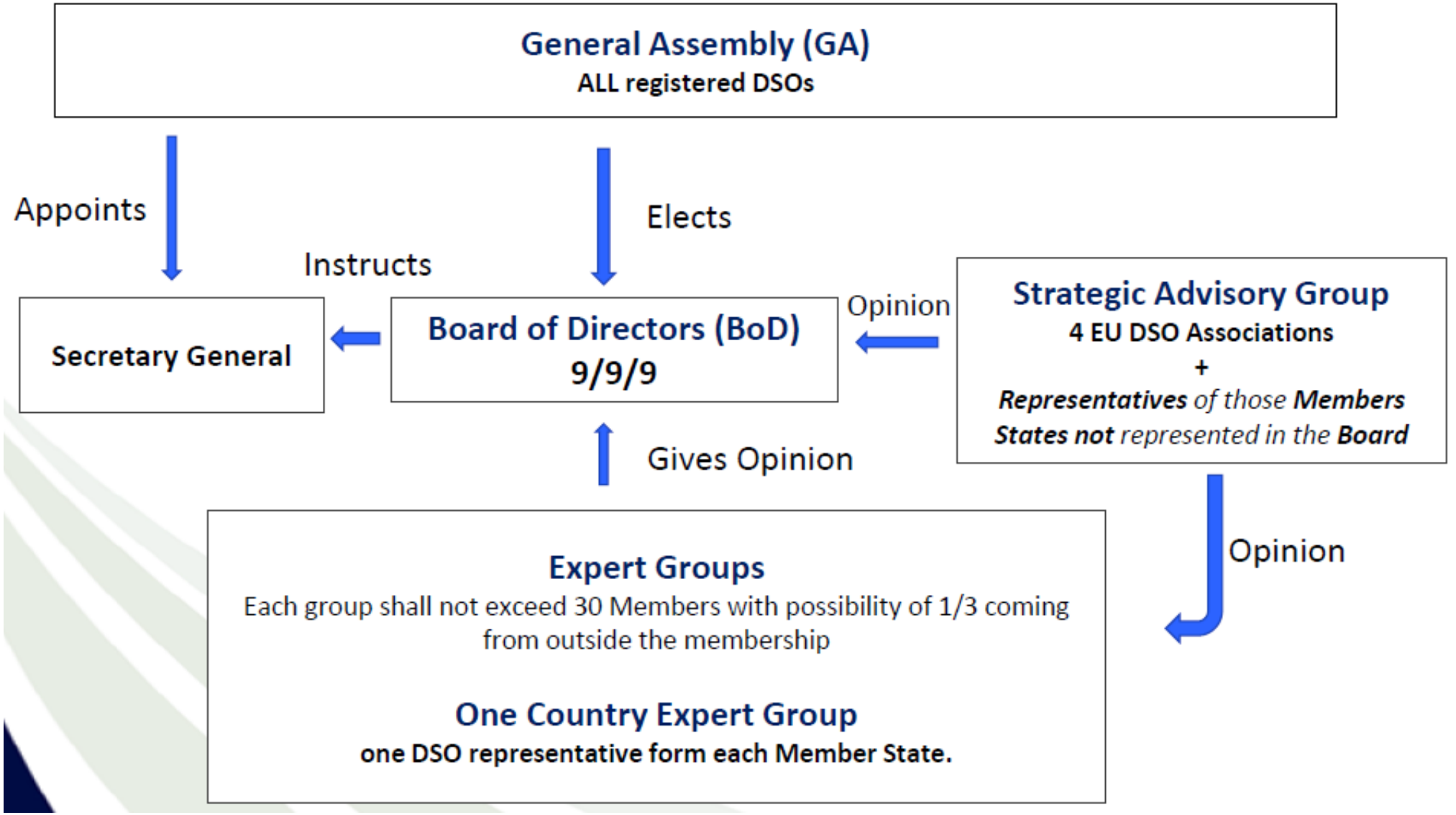
= accounting point

= metering



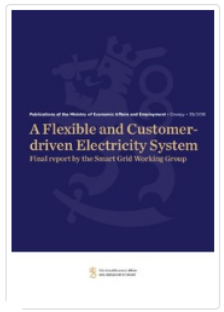
- Customers may also have production elsewhere than within their own real-estate property or in its immediate vicinity. **A distributed energy community makes it possible to locate energy resources to a more suitable place.**
- Each generation or consumption site of a distributed energy community needs its own network service contract with the local DSO. They should pay on the use of the network according to the general principles.
- Electricity taxation to be implemented according to current taxation practices.

DSO Entity - Structure



Flexible and customer-centred electricity system; Final report of the Smart Grid Working Group

Pahkala, Tatu; Uimonen, Heidi; Väre, Ville (2018-11-13)



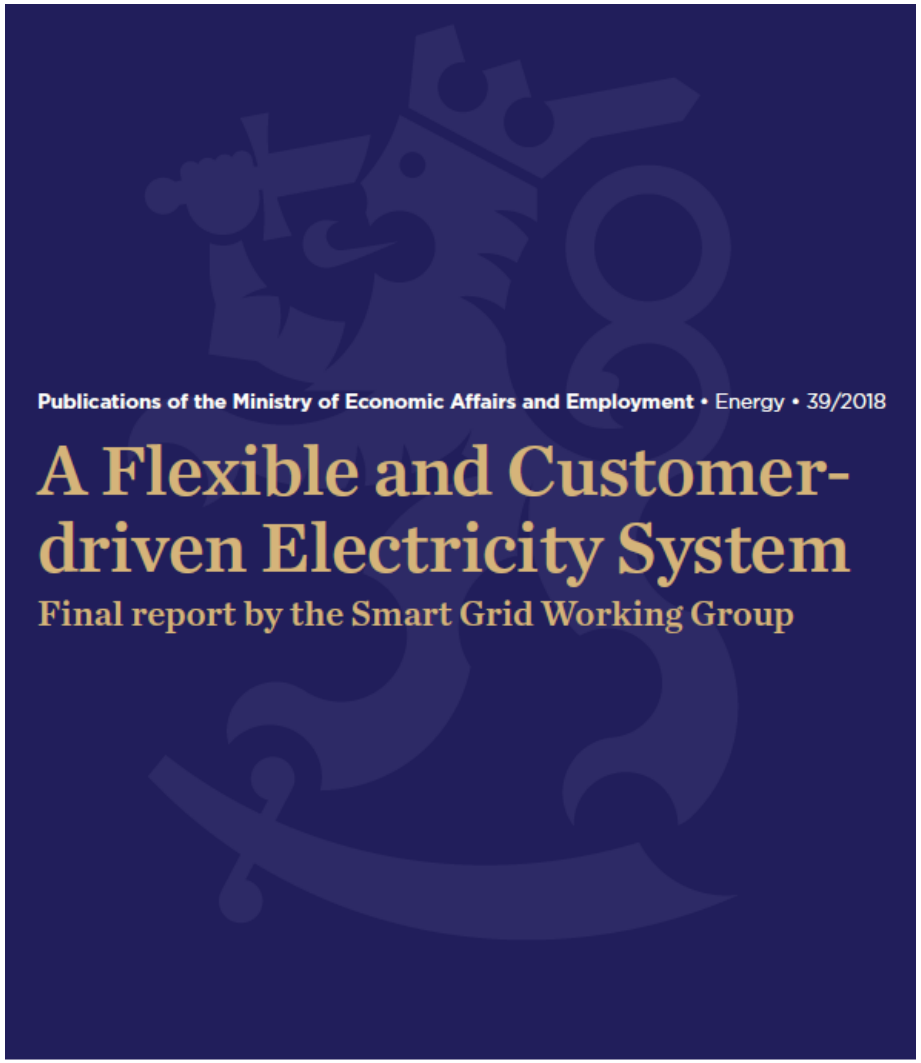
Julkaisun pysyvä osoite on
http://urn.fi/URN:ISBN:978-952-327-352-8

The smart grid working group was commissioned to present concrete actions that would impr opportunities to participate in the electricity r promote security of supply. The working response to be a competitive bus distribution network operators shou manner. Market participants wo Voluntary single invoice would create mo welcomes

http://urn.fi/URN:ISBN:978-952-327-352-8

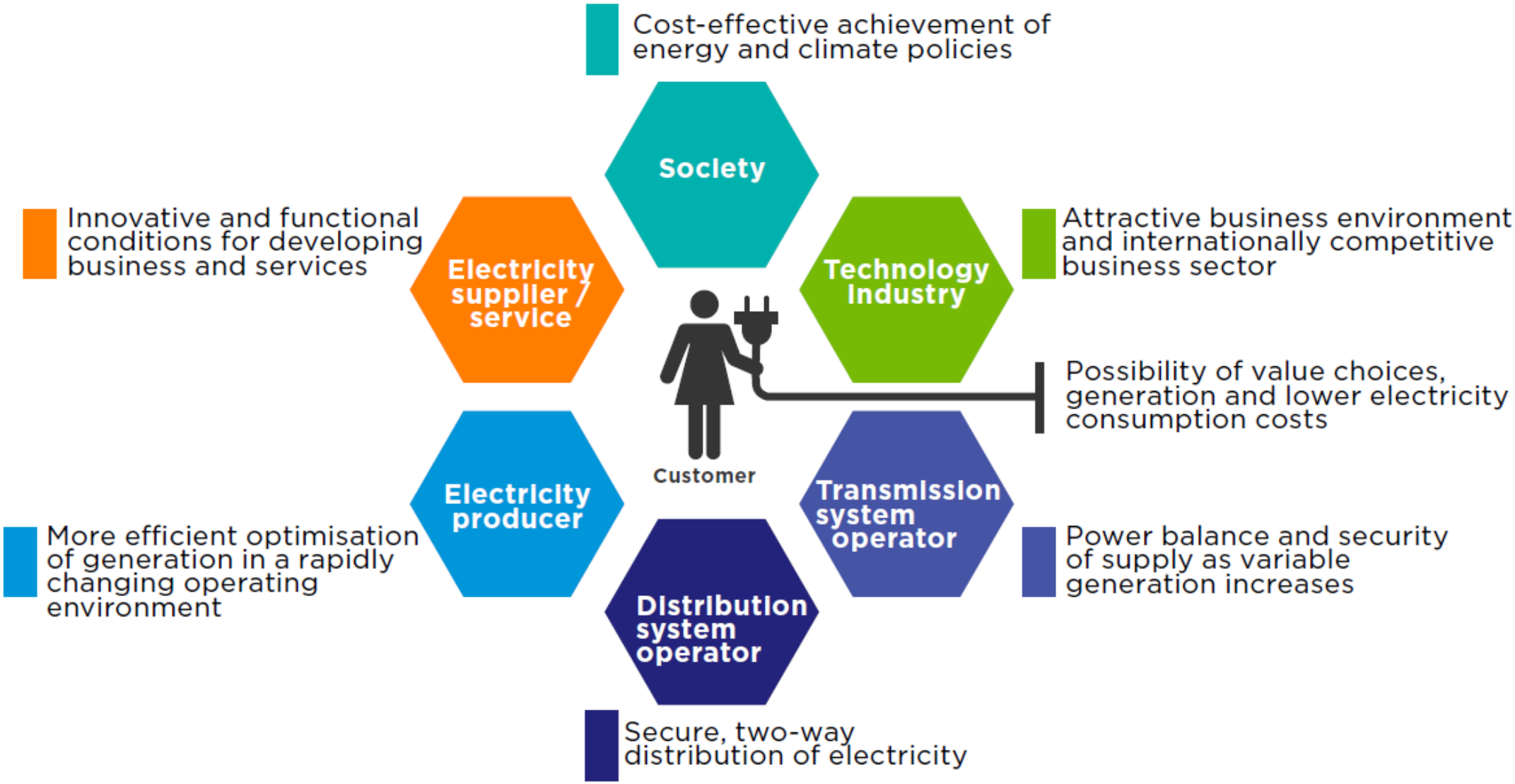
Tasks

1. Creating a vision of the smart electricity system of the future
2. Explore and propose concrete measures
    - through which a smart electricity system could facilitate the ability of customers to actively participate in the electricity markets
    - to promote the maintenance of security of supply



Ministry of Economic Affairs and Employment of Finland

Smart grid vision



Finnish smart grid vision - Ministry of Economic Affairs and Employment, 31 October 2018

Finland is a forerunner in the energy sector

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