

Achieving carbon neutral energy system

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Sustainable energy finance forum Finland

29.9.2020



Finnish Energy

Low-carbon roadmap for the energy sector



Energiateollisuus

ROADMAP

TOWARDS CARBON-NEUTRAL ENERGY



New energy system

- Sector integration of energy
- Cooperation with the customer
- Enabling energy networks
- Developing expertise

Cleaner energy

- Emission-free electricity
- Integrating district heat
- Facilitating circular economy
- Domestic bioeconomy
- Cleaner gas

Energy as a solution

- Electrifying industry
- Cleaner traffic
- Sustainable heating solutions

Electrification

- uptake of new technologies

Clean generation of power and heat

- a half is done, the rest is planned and doable and can be scaled up

System and sector integration

- unless developed as a system, no way to reach climate goals nor the resource-wise circular economy

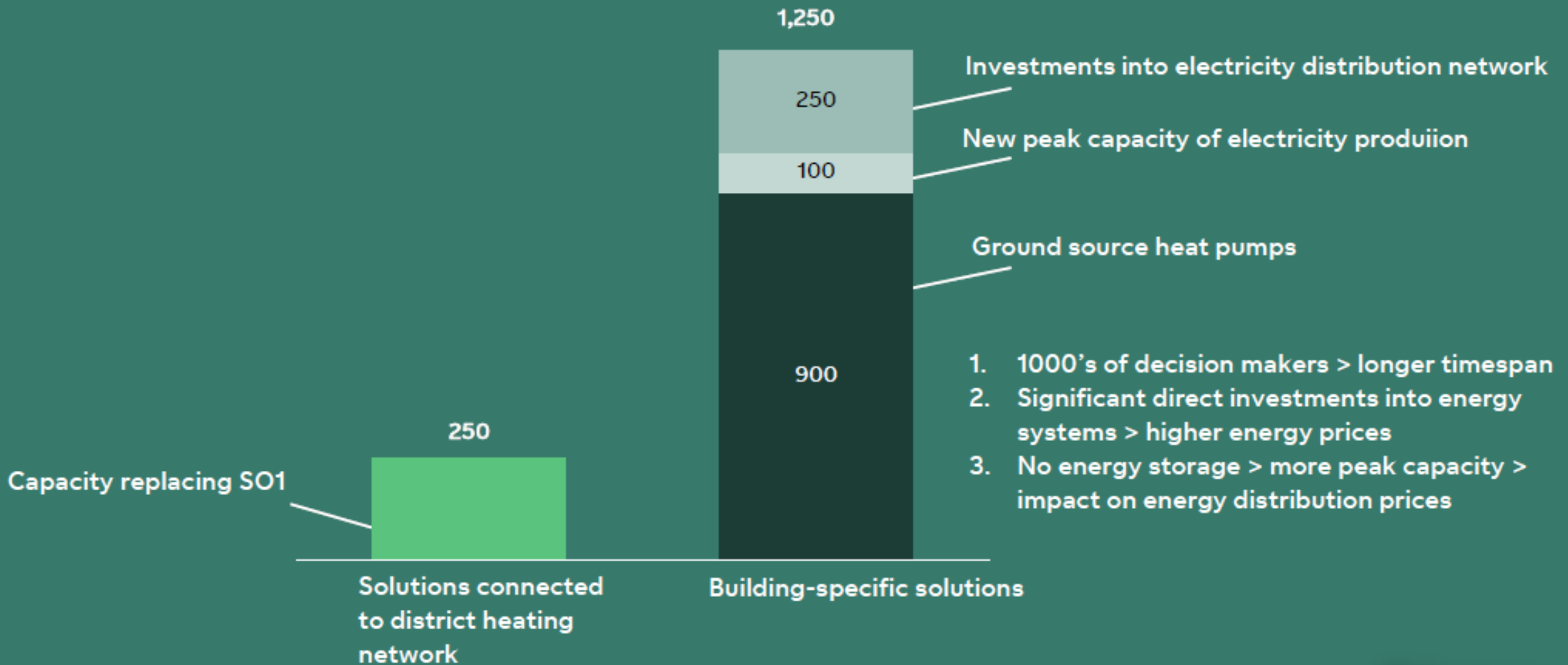
New energy system

An emission-free, cost-effective and secure energy system is based on smart integration of different sectors and on innovative solutions.



- Sector integration means the interconnection of industry, transport and heating via electricity, district heat and gas networks. At the same time, the customer's role will change from a consumer of energy to a storer and possibly also a producer of energy.
- Energy transition is under way, and it requires continuous investment. The challenge is to realise the transition in a profitable way. Society can accelerate the transition by investing in the necessary technology for research, development and piloting.
- Cooperation with customers creates opportunities to develop new heating solutions and enrich the energy system to be inclusive and interactive.
- Building of the new energy system requires diverse experts and new know-how in all parts of Finland.

Towards carbon-neutral heating: illustrative cost comparison, Espoo (Meur)



Key messages

- Main target = carbon neutral energy system. Pricing of carbon decisive driver for investments. Commission's proposal to enlarge and strengthen the EU ETS important.
- Target requires huge amount of investments, both money and time are limited
- Deep decarbonisation is more than just change in the production or reduction in consumption
 - Change in energy use and production leads to large change in the energy system
- Energy investments should support the system transformation
- Customers' investments in energy system will increase, customer engagement and empowerment important
- Role of grids will increase, not decrease due to sector integration
- Public funding and support are needed especially in the development and commercialisation of new technologies
 - Heating without fuels, power-to-X, green gases including hydrogen, electrification of industries, storage etc.
- Generation investments can be financed and will be done at the pace of demand