Overview of the heat market in the Baltic countries and future prospects

Baltic District Heating and Gas Market Mini Forum

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Fortum

Fortum in brief

Forerunner in clean energy

Some 8,000 energy professionals

Nordic and Baltic countries, Russia, Poland

64% of power generation CO_2-free - in EU 97%

Core competences in hydro and nuclear power, combined heat and power production and in operating on energy markets

Energy-related products and expert services

1.3 million electricity sales customers

Figures: 2015

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Fortum – Forerunner in clean energy

MEGATRENDS

Climate change
Urbanisation
Active customers
Digitalisation, new technologies

MISSION

We provide customers with energy solutions that improve present and future life, and we deliver excellent shareholder value.

STRATEGY

- Drive productivity and industry transformation
- Create solutions for sustainable cities
- Grow in solar and wind
- Build new energy ventures

MUST-WIN-BATTLES

Put the customer in the centre | Establish a culture of speed and agility | Digitalise our business for maximum scalability | Create value from market volatility | Drive competitive markets and fair regulation

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Regulatory oversight on DH pricing in some EU countries

Regulatory focus

DH competitiveness and long-run price levels (*DH promotion against alternatives*)

Cost recovery, return allowance and annual cost scrutiny (*customer protection against inflation and fundaments*; *separate regulation of heat distribution and production tariffs*)

Alternative-based heat pricing as main pricing principle to promote DH against other heating solutions

- Stipulated by Norwegian Energy Act

DH company sets competitive/cost-reflective prices while authorities monitor price changes and levels based on competition law

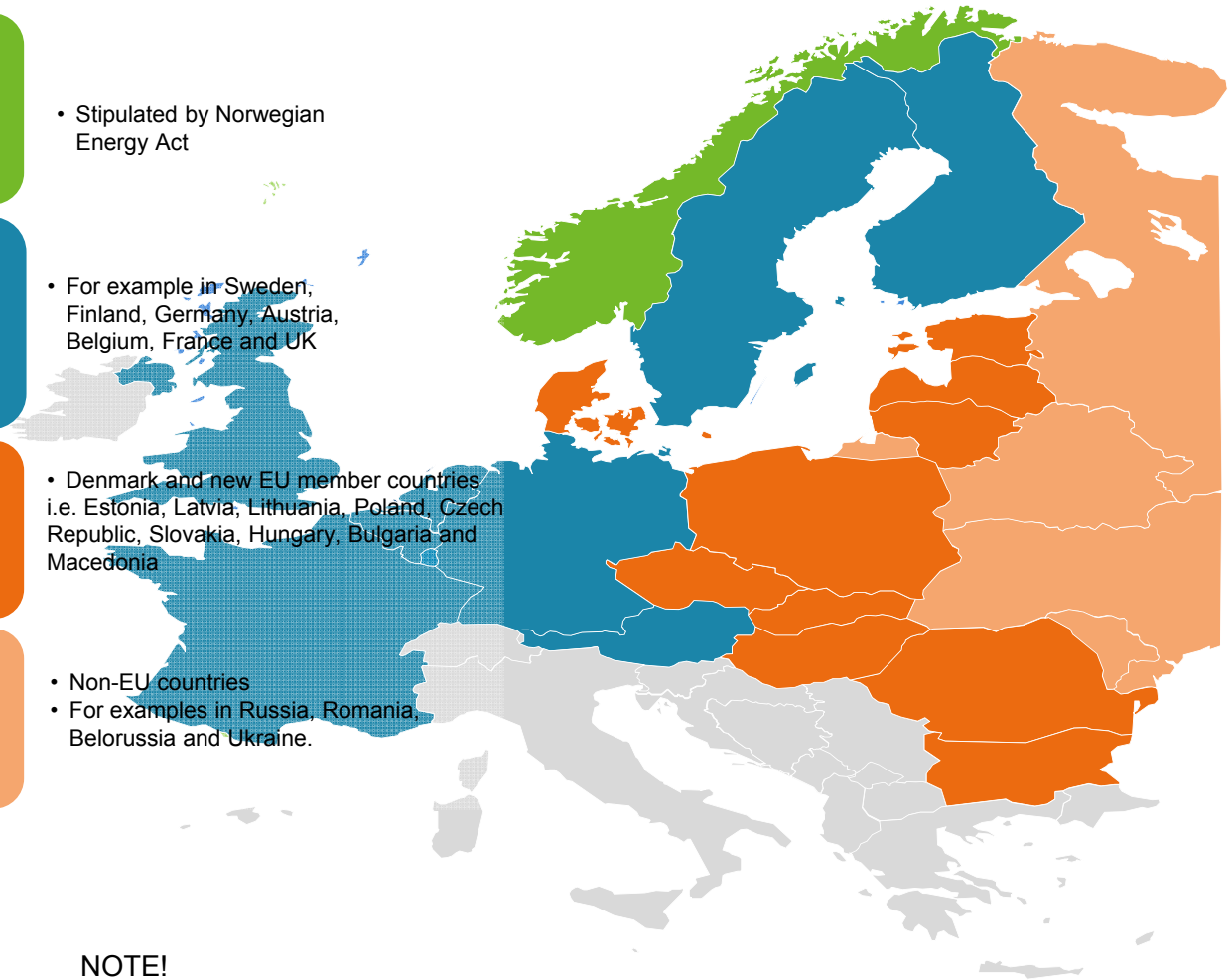
- For example in Sweden, Finland, Germany, Austria, Belgium, France and UK

Ex-ante price control based on established methodologies and/or regulator's heavy discretion

- Denmark and new EU member countries i.e. Estonia, Latvia, Lithuania, Poland, Czech Republic, Slovakia, Hungary, Bulgaria and Macedonia

Heavy-touch ex-ante price control based on multi-level approval from state, regional and local authorities

- Non-EU countries
- For examples in Russia, Romania, Belorussia and Ukraine.



NOTE!

- Alternative-based heat production price caps for CHP plants are used in several countries
- Heat market reform in Russia is considering alternative-based, end-customer DH price caps which would transform Russia to belong to blue/green categories

Sources: KPMG country-by-country DHC/CHP benchmark surveys, Euroheat & Power Year Book and Fortum analysis

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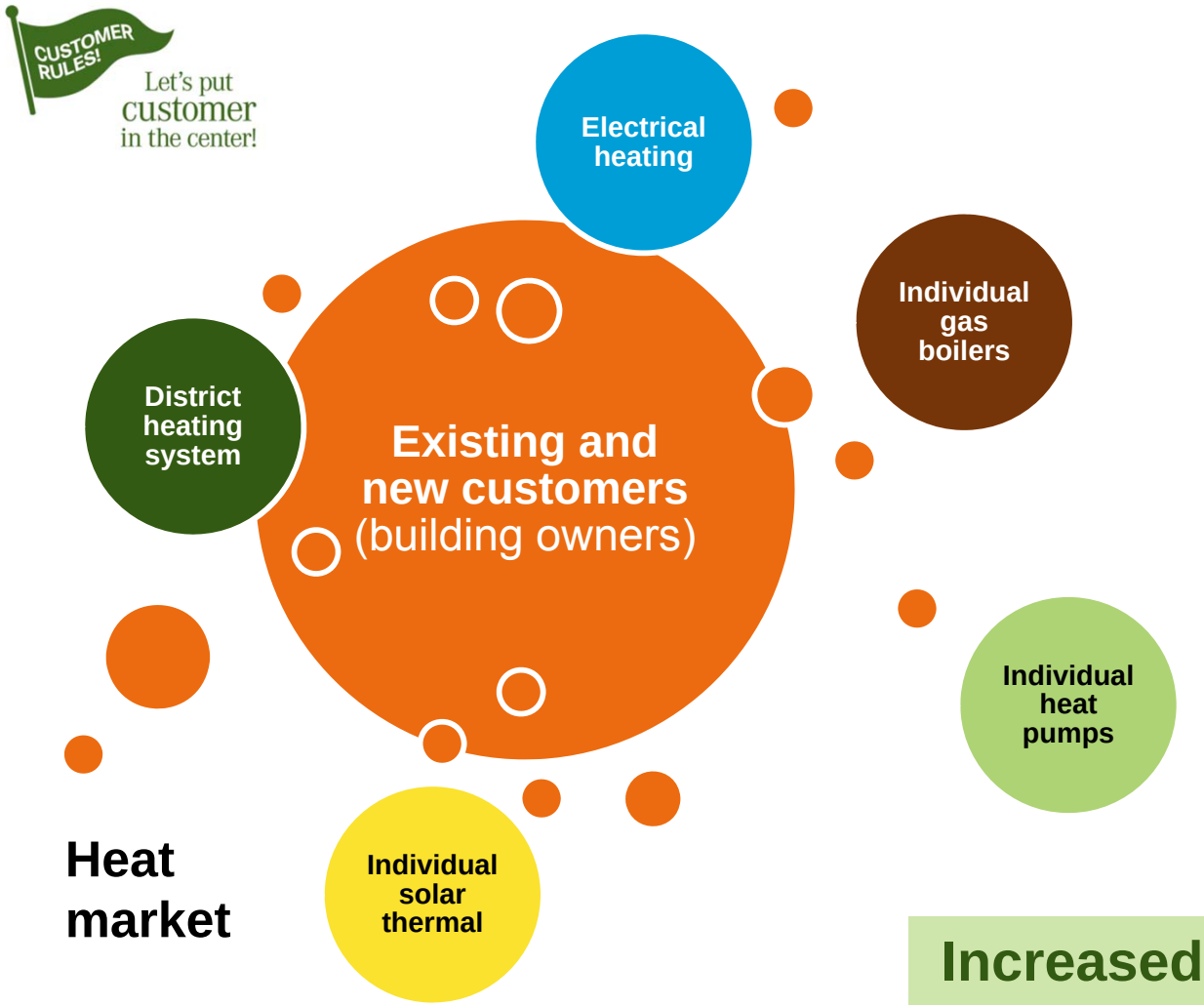
Customers

What is the heat market?

Heat market should be driven by customers and competition



- End-customer's freedom to chose enhances engagement and trust on heat providers
- Fair competition between alternatives calls for affordability
- Equal competition rules should replace unequal regulatory treatment of alternatives
- New technologies more likely to emerge and to be utilised
- Drives for best resource and system efficiency and for cost-optimality

Increased DH system flexibility required

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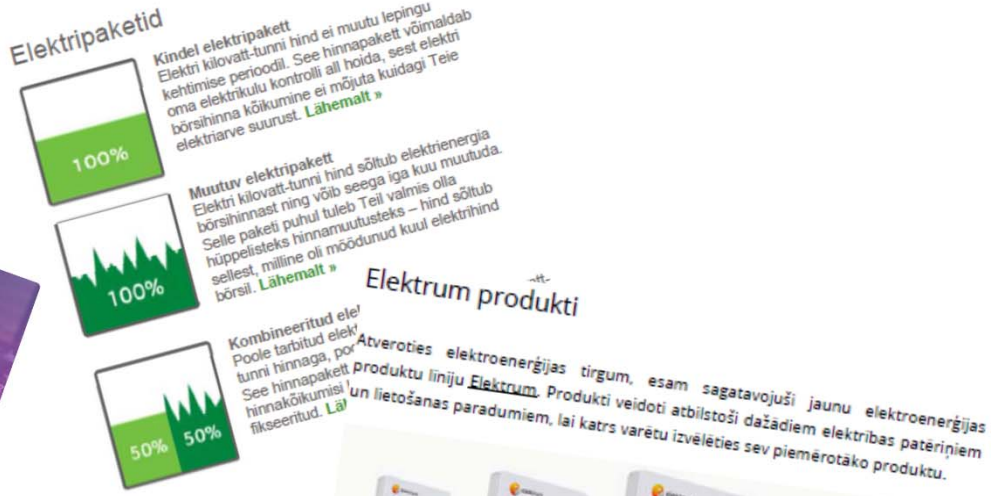
Changes on the energy market affect the heat market



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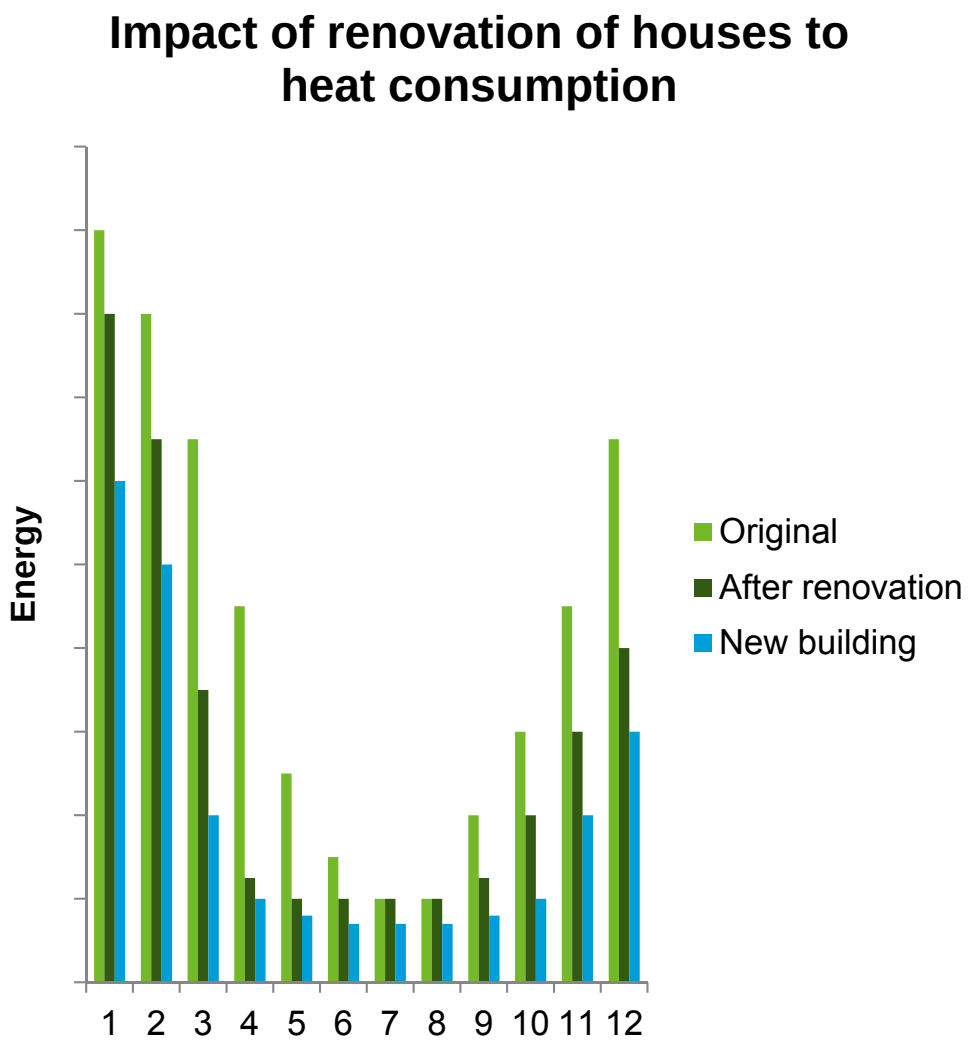
Increased energy efficiency will decrease consumption



- Energy efficiency measures will gradually decrease consumption of present customers.
- Size of reduction can be about ⅓.
- New buildings will use even less heat.
  - Integrated hybrid systems including cooling.
- Energy efficiency highly promoted by:
  - Energy Efficiency Directive EED
  - Energy Performance on Buildings Directive EPBD

It is important to be able to adopt the pricing for different customer usage

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Changes in competitiveness of other heating solutions

- Recent dip in the price of oil and natural gas.
- Low end customer prices in electricity in some countries.
- Record low interest rates enabling customers to get financing for switch of heating solution.
- Development of technology of heat pumps.

It is important to be to respond to changes in competitors' prices smoothly

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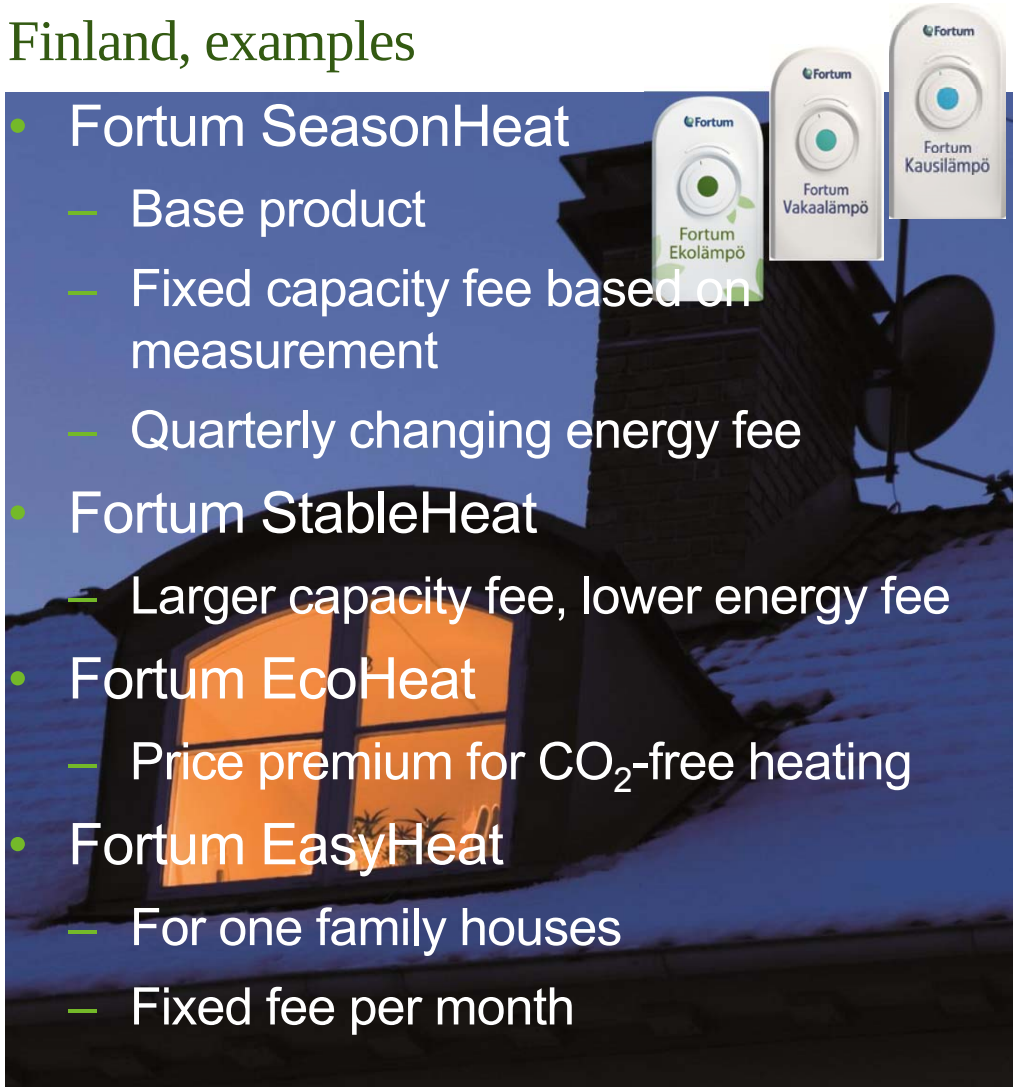
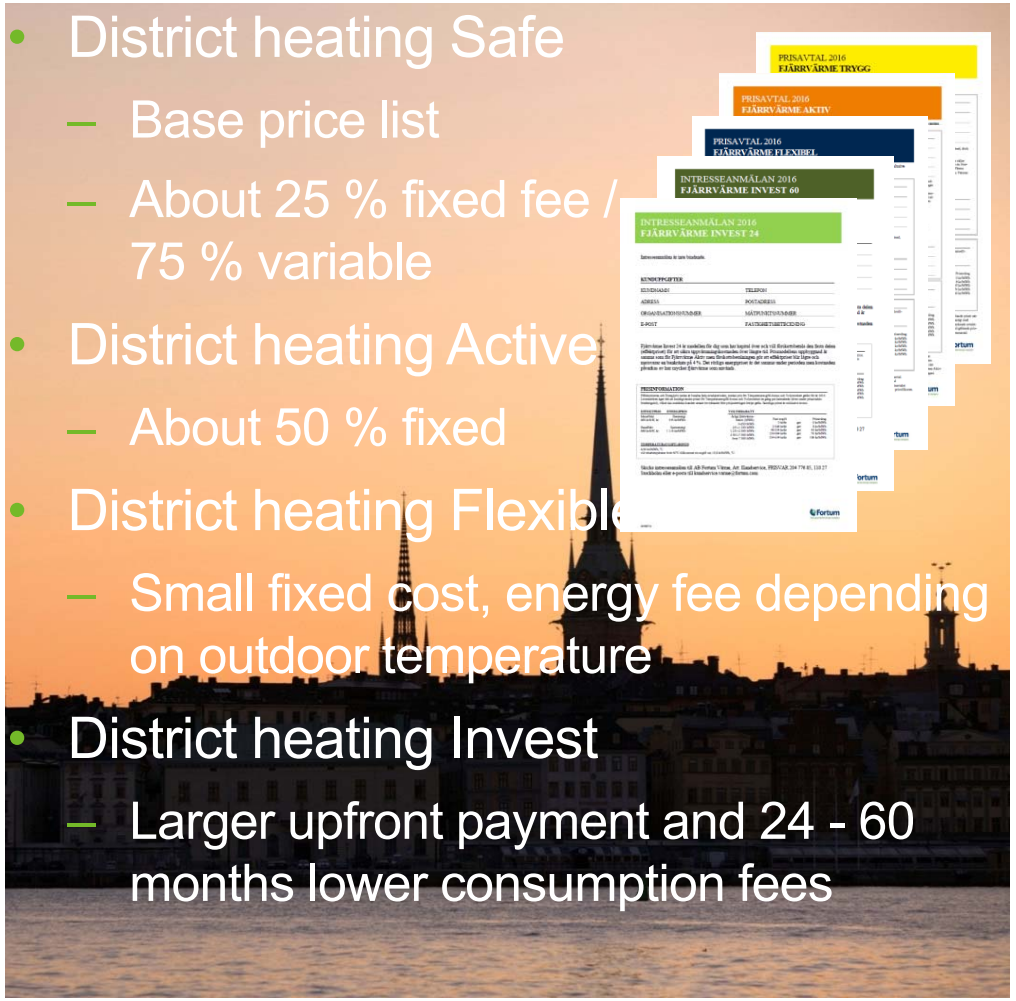
More choices for the customer in a non-discriminatory way

Finland, examples



- Fortum SeasonHeat
  - Base product
  - Fixed capacity fee based on measurement
  - Quarterly changing energy fee
- Fortum StableHeat
  - Larger capacity fee, lower energy fee
- Fortum EcoHeat
  - Price premium for CO_2-free heating
- Fortum EasyHeat
  - For one family houses
  - Fixed fee per month

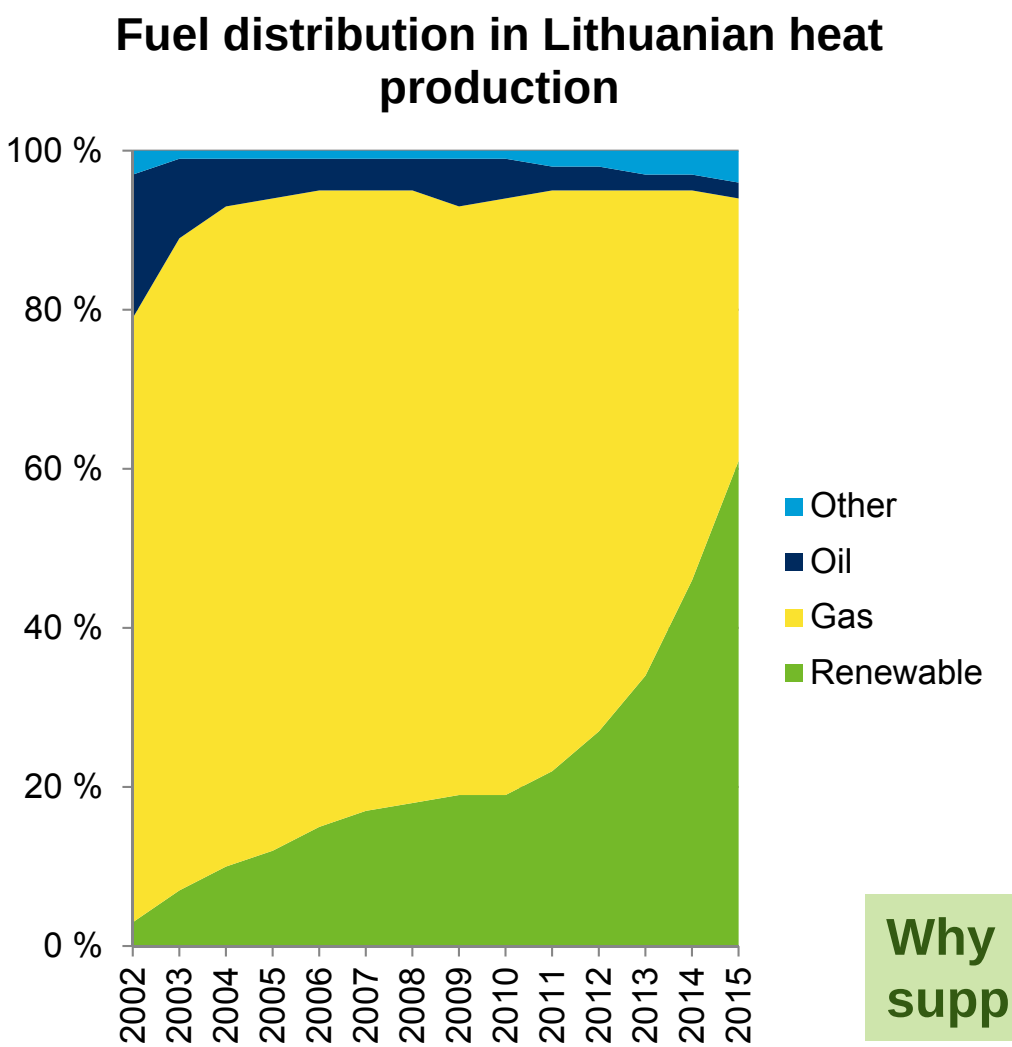
Sweden, examples



- District heating Safe
  - Base price list
  - About 25 % fixed fee / 75 % variable
- District heating Active
  - About 50 % fixed
- District heating Flexible
  - Small fixed cost, energy fee depending on outdoor temperature
- District heating Invest
  - Larger upfront payment and 24 - 60 months lower consumption fees

Production

Heat production changes



Source: Euroheat & Power / LSTA

- Large fuel transition from fossil fuels towards renewable ones in all countries.
- Old production capacity largely still in place.
  - Even 3 times more installed capacity in some cities compared to used!
  - Normally this cost is included in the end-customer tariff.
- Both competition and regulation occur in production – sometimes at the same time.

Why is production regulated? Do the heat suppliers need protection from the producers?

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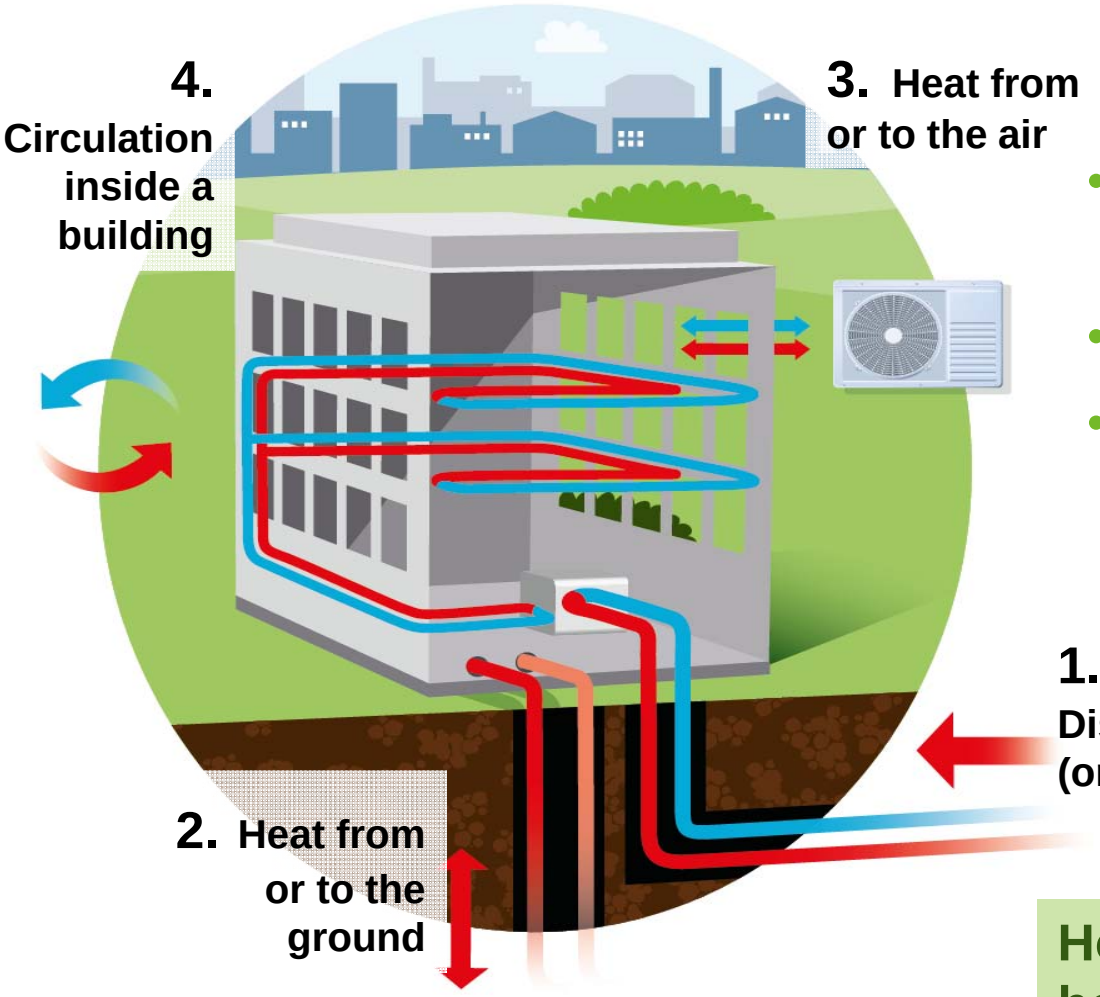
Cooling can be utilised for heating



- There is too much heat inside of a building
- Competitive solutions are 2-way
- Two way heat transfer is a natural part of the heating market

How will utilisation of waste heat sources be done in a regulated environment?

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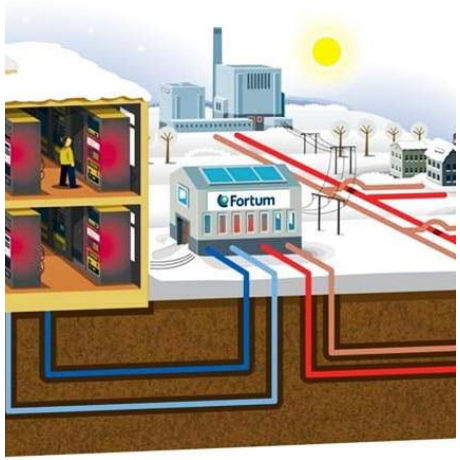
New innovative production solutions, examples

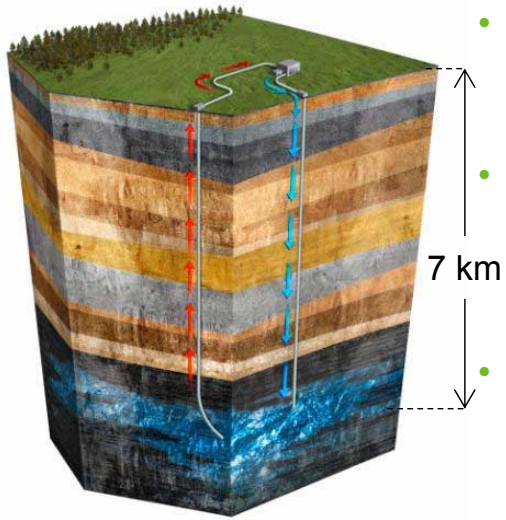
Heat recovery from data centres

- The heat from the servers in the data centres is utilised fully for district heating in Espoo, Finland since 2011
- The amount of recovered heat is about 50 000 MWh



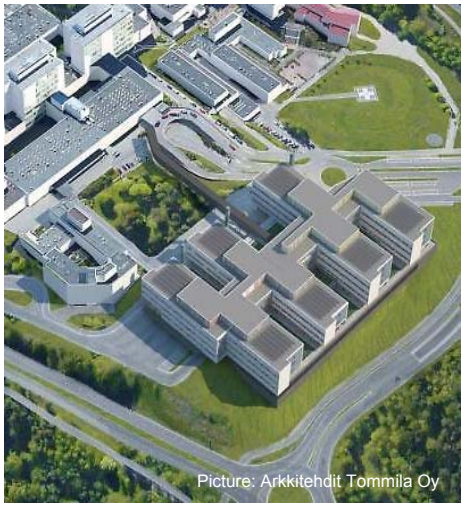
Geothermal heat production

- In cooperation between Fortum and St1.
- The target is to build the first geothermal pilot heat plant of industrial size in Finland. Estimated time of commissioning in 2016–2017.
- The geothermal heat plant is expected to produce heat with a capacity up to 40 MW covering about 10 % of the energy demand.



Smart district heating and cooling of a hospital in Espoo, Finland

- The first two-way pilot solution of smart district heating in Finland
- Finalised during 2015–2016
- In smart district heating the customer can sell the heat not needed back to the network



Heat recovery from sewage water

- Waste heat from the cleaned sewage water is recovered fully with heat pumps.
- The amount of recovered heat is about 300 GWh, or nearly 15 % of the total heat demand of Espoo.
- Commissioned in December 2014.

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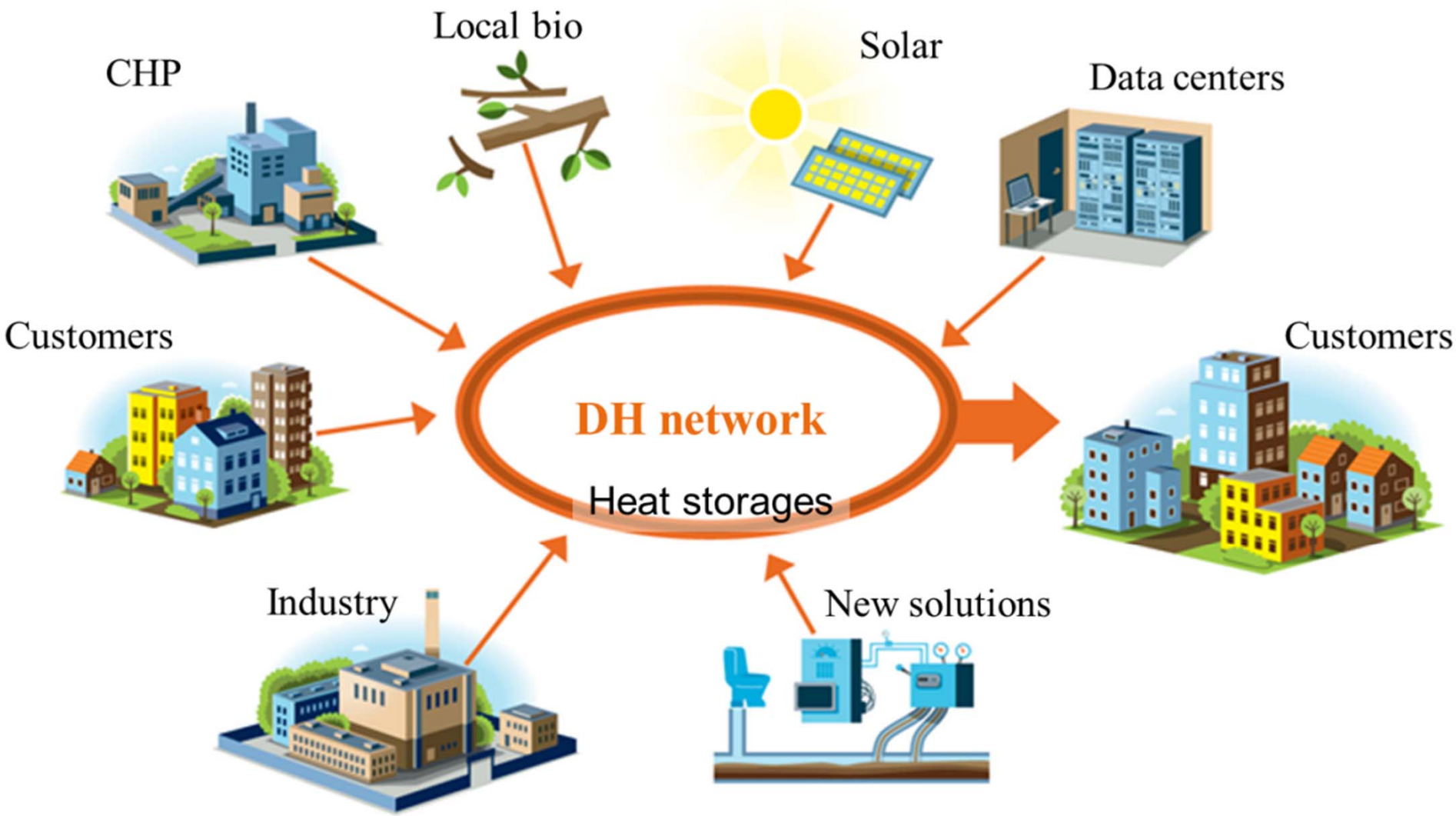
Smart district heating networks



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Key take-aways

- Energy efficiency measures will **drop consumption** significantly
  - One-component tariff structures should be replaced as soon as possible.
- The **consumption profiles** of different customers will **change**
  - One tariff will not be enough to cover the needs of the customers.
- Technology will enable **new heating alternatives** for the customers
  - District heating has to develop in order to stay attractive.
- **Cooling** becomes a standard solution in buildings
  - Heat companies have to respond to this need to stay attractive.
- New renewable forms of production and **heat recovery** will emerge
  - Optimisation of the production becomes even more important.

Avoid over-regulation

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Thank you!