

Long-term perspectives for district-heating and cooling systems from Helsingin Energia

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World leading in CHP

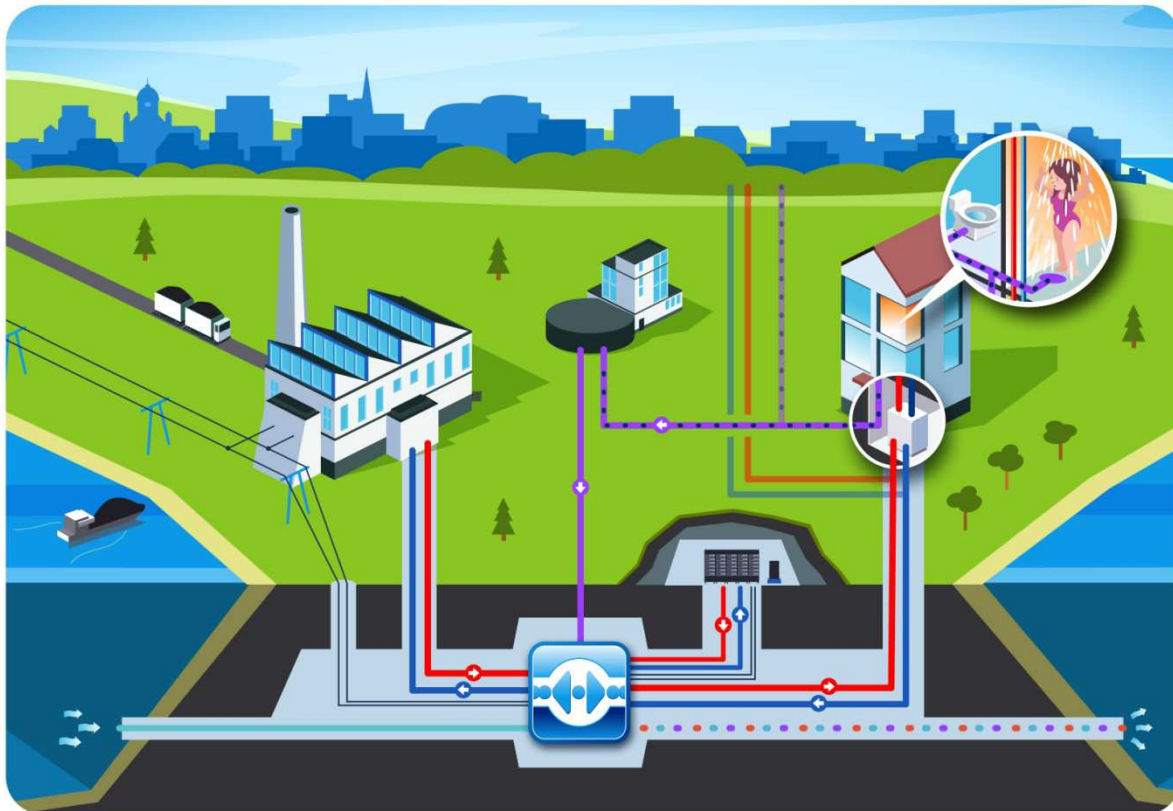


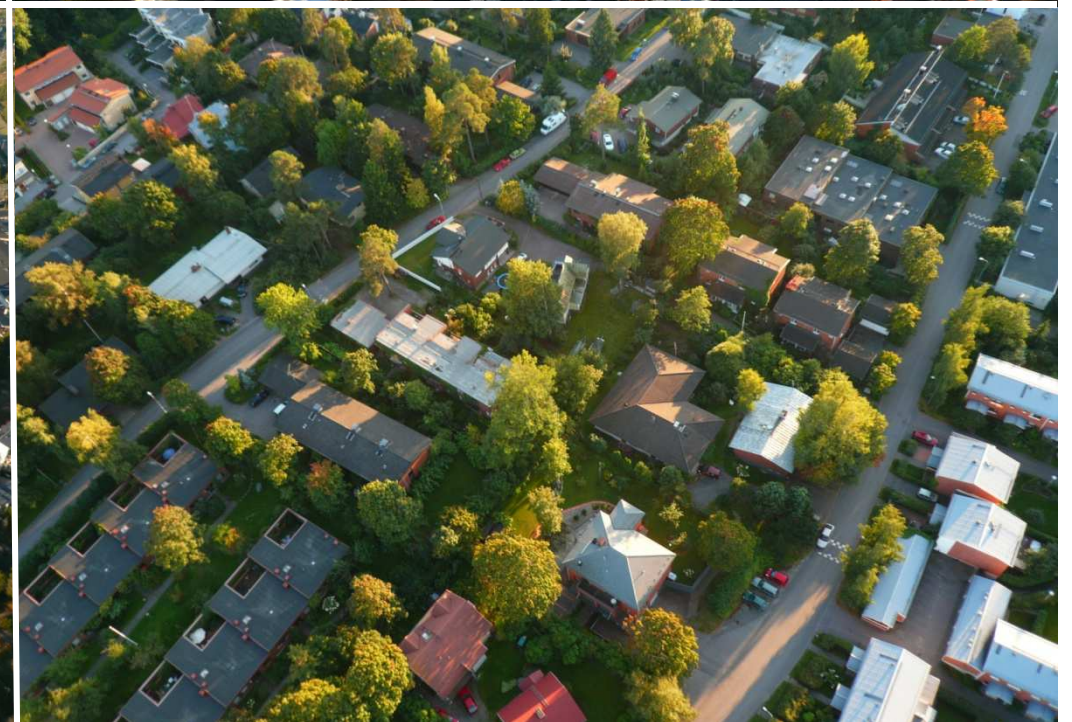
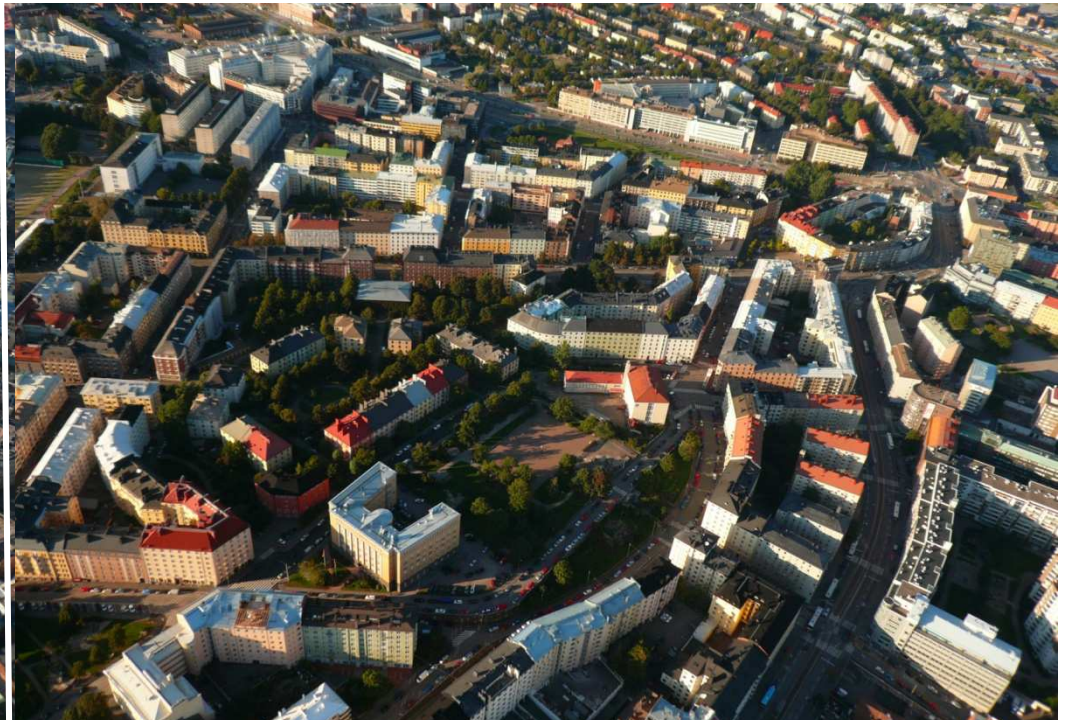
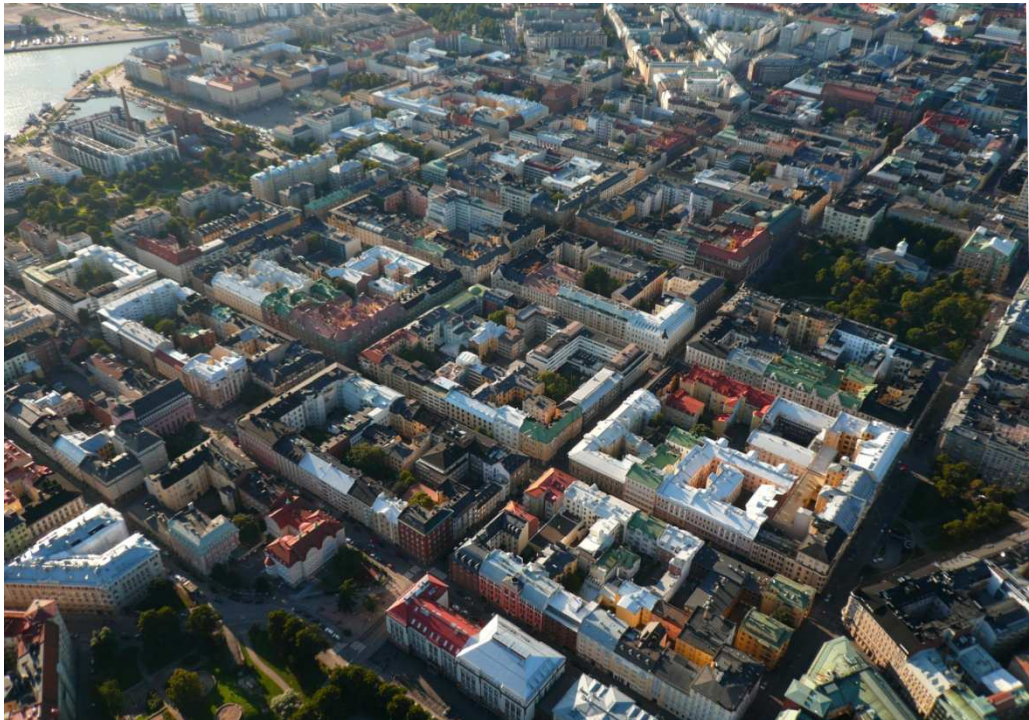
World leading in CHP

- Helsingin Energia is one of the largest energy companies in Finland.
 - World top class in energy efficiency.
 - Supplies electric energy to nearly 400 000 customers in Finland.
 - Covers over 90% of the heat demand of the capital city with district heating.
 - Produces and sells district cooling, first commercialized in a successful business model.
 - Very competitive electricity and cooling prices.
 - Other services provided are design, projecting and maintenance of energy production and distribution systems.
 - For-profit company owned by the city of Helsinki.
- Year 2010 the company had net turnover of about one billion USD (€723 million) and over 1200 employees. Very high profitability of over 300 million USD (€247 million)

As early as in 1913, the director of the electricity board proposed combined heat and power generation. In 1953, the city council made a decision to build an extensive district heating network in Helsinki.

Currently, 93% of the city's heating needs are met with district heat, which is produced in a diverse way at four power plants, heat pump plants and peak load plants. Energy efficiency has improved further when district cooling is produced in the same processes.



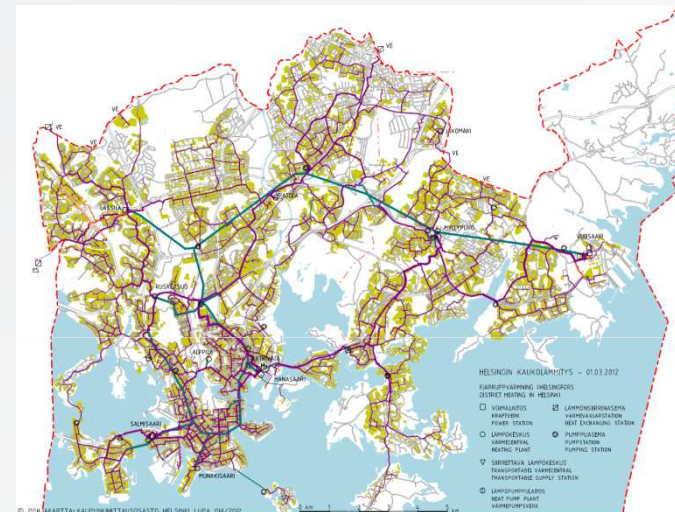


Energy sales in 2011

	2011	2010	Muutos
District heating	6450 GWh	7370 GWh	-12,4 %
District cooling	96 GWh	83 GWh	+ 15,7 %

Heating year 2011

• Sales	6450 GWh
• New customers	201
• Growth in connected power	18 MW
• Number of customers	14211
• Connected power	3262 MW
• Turnover	312 M€
• Network length	1300 km
• Investments	30 M€
• New network	32 km
• AMR	



Cooling year 2011

• Sales	93 GWh
• New customers	38
• Growth in connected power	20 MW
• Number of customers	194
• Connected power	117,2 MW
• Turnover	10,9 M€
• Network length	52 km
• New network	6,2 km
• Investments	8,0 M€



Customer promise

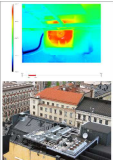
- Reliability and supply for full (100%) demand, no need for additional energy sources
 - Highest DH-peak of 2700MW and still 700MW of reserve capacity
 - Highest DC-peak of 70MW and still 30MW of reserve capacity
- Continuous improvement and R&D work for lighter district heating and cooling systems
- CHP plants taking action towards bio-fuels
- Peak heating plants ready for bio-oil
- 60MW of heat recovery from sewage water at Katri Vala heat pump plant
- Maintenance-free supply, customer has no worries of it's own heat, cooling or electricity production.
- None of the customers electricity is reserved for either heating or cooling



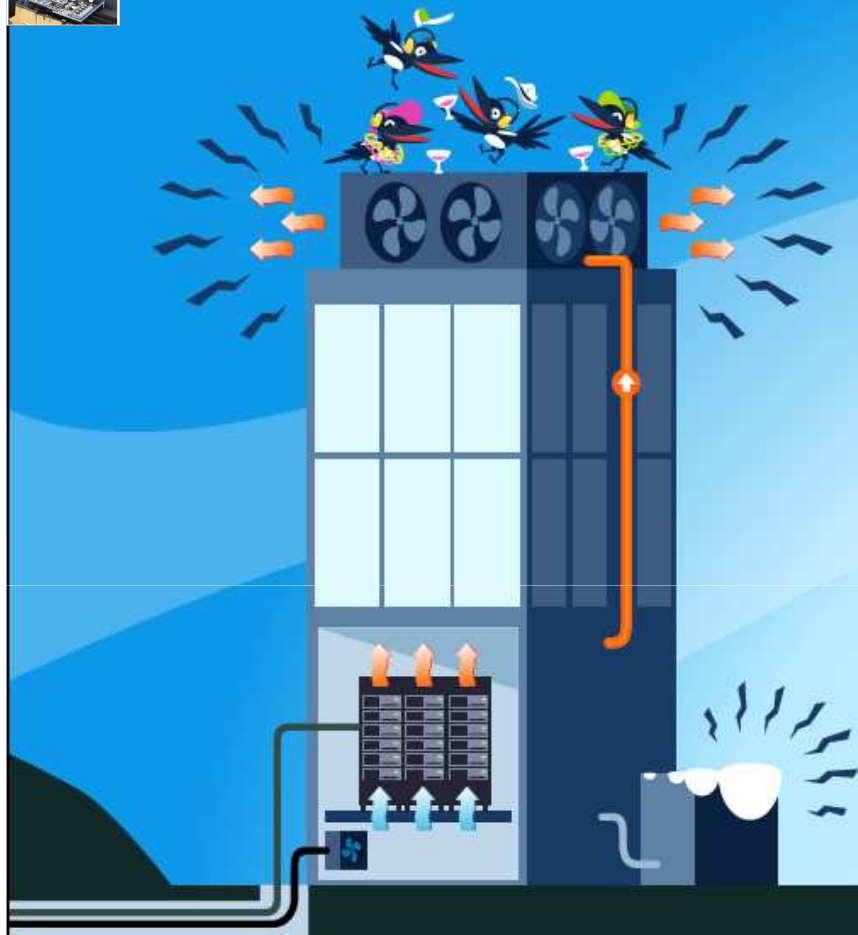
100%

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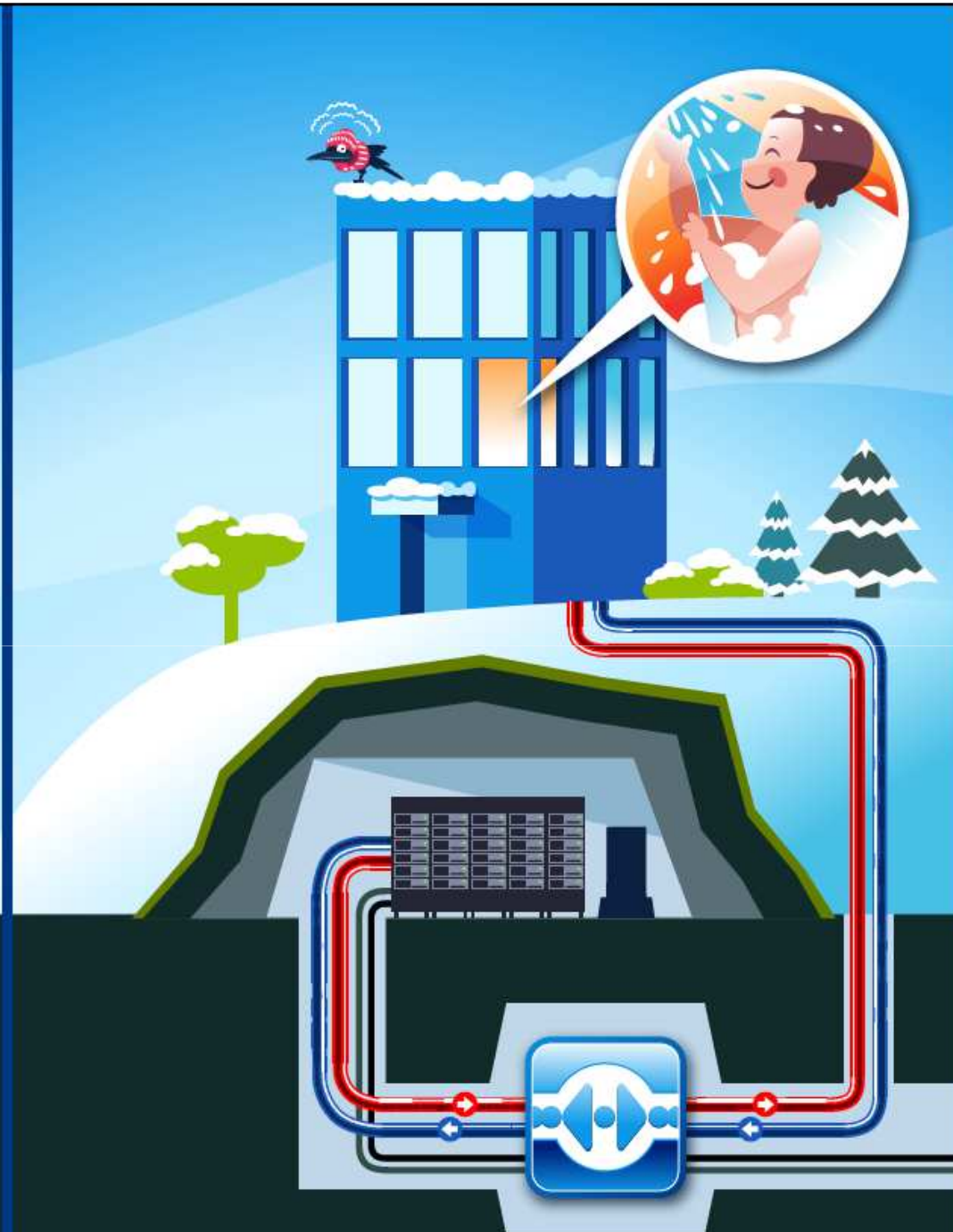
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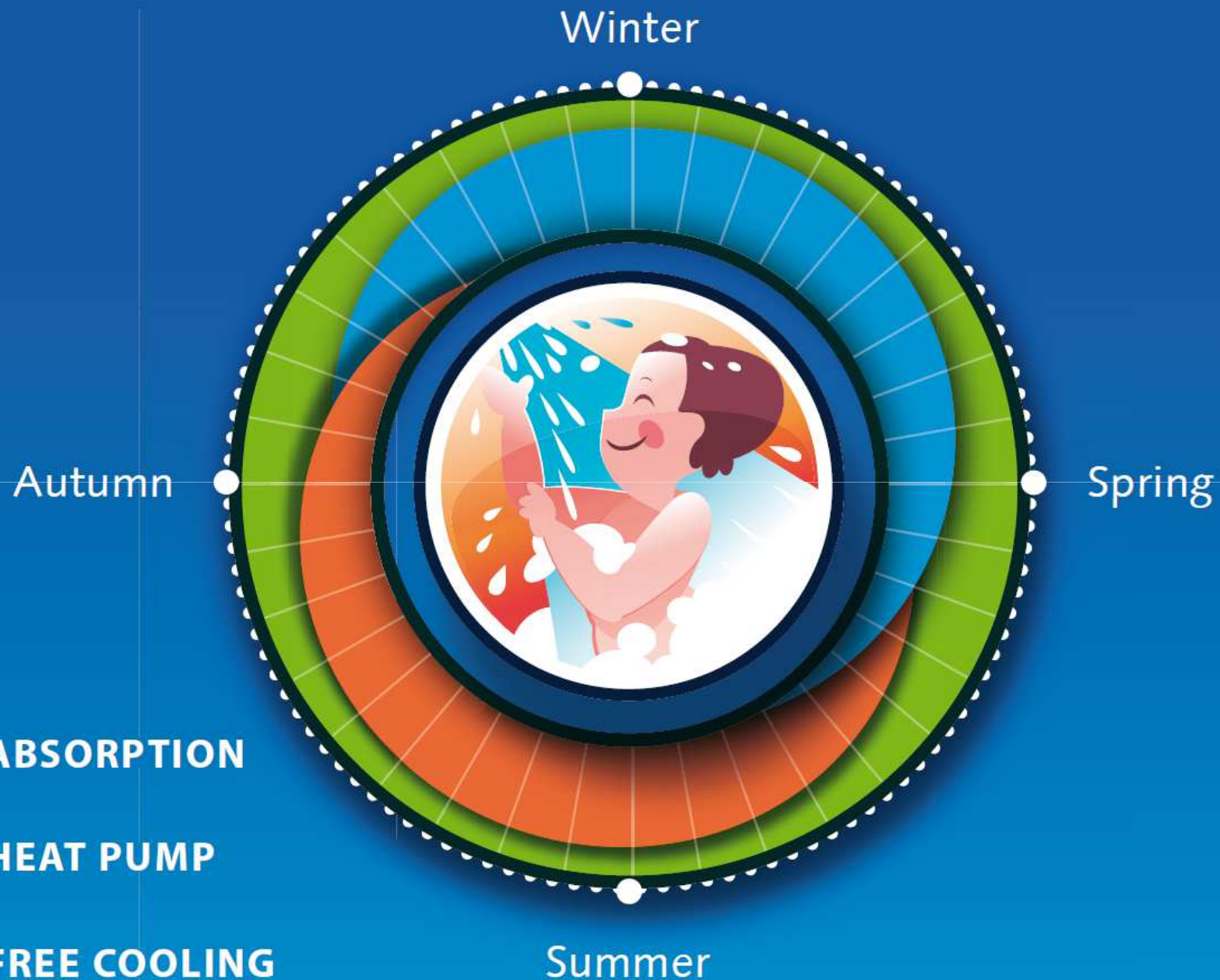


Conventional solution

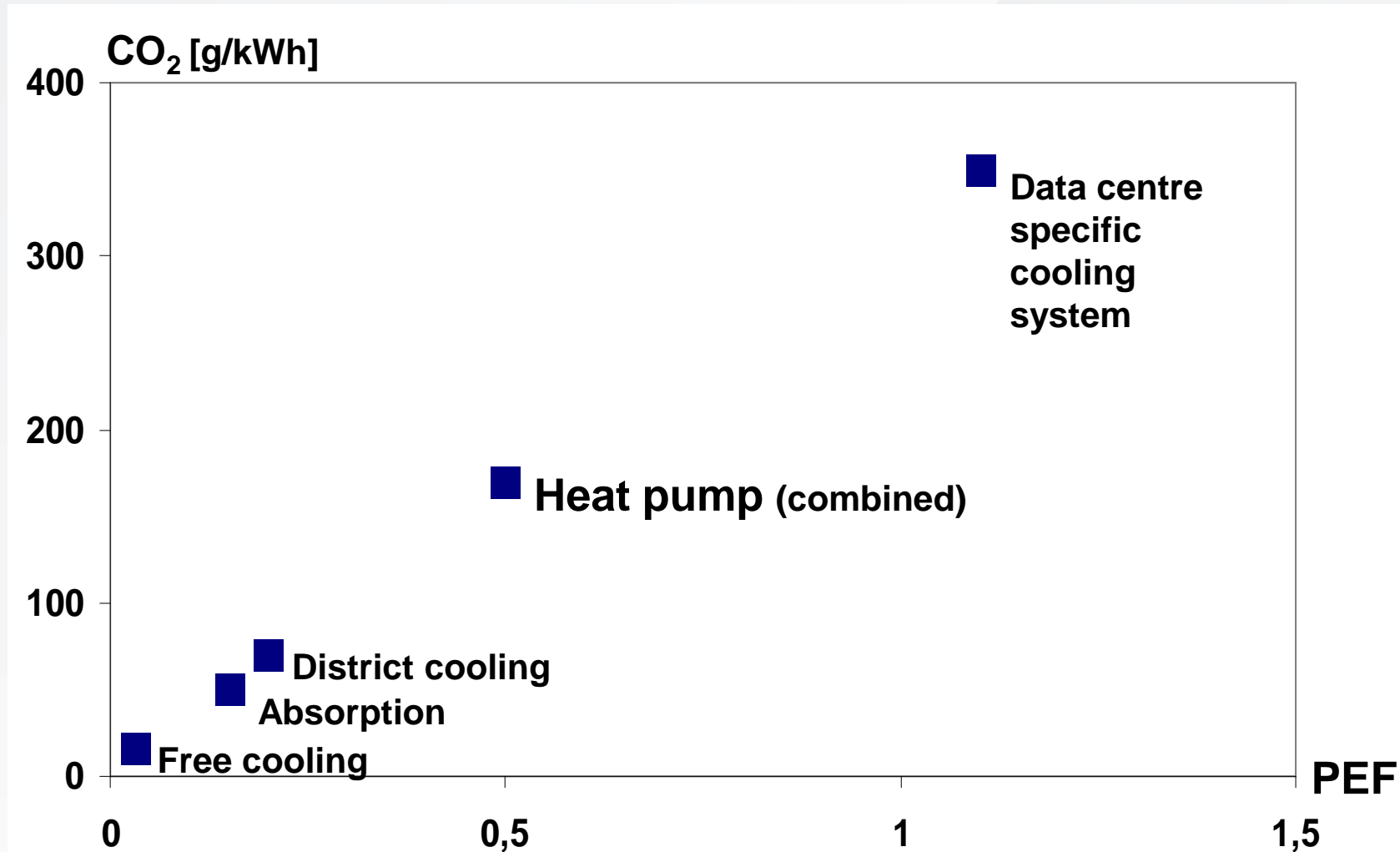


New solution

District cooling production methods



CO₂ emissions of cooling options

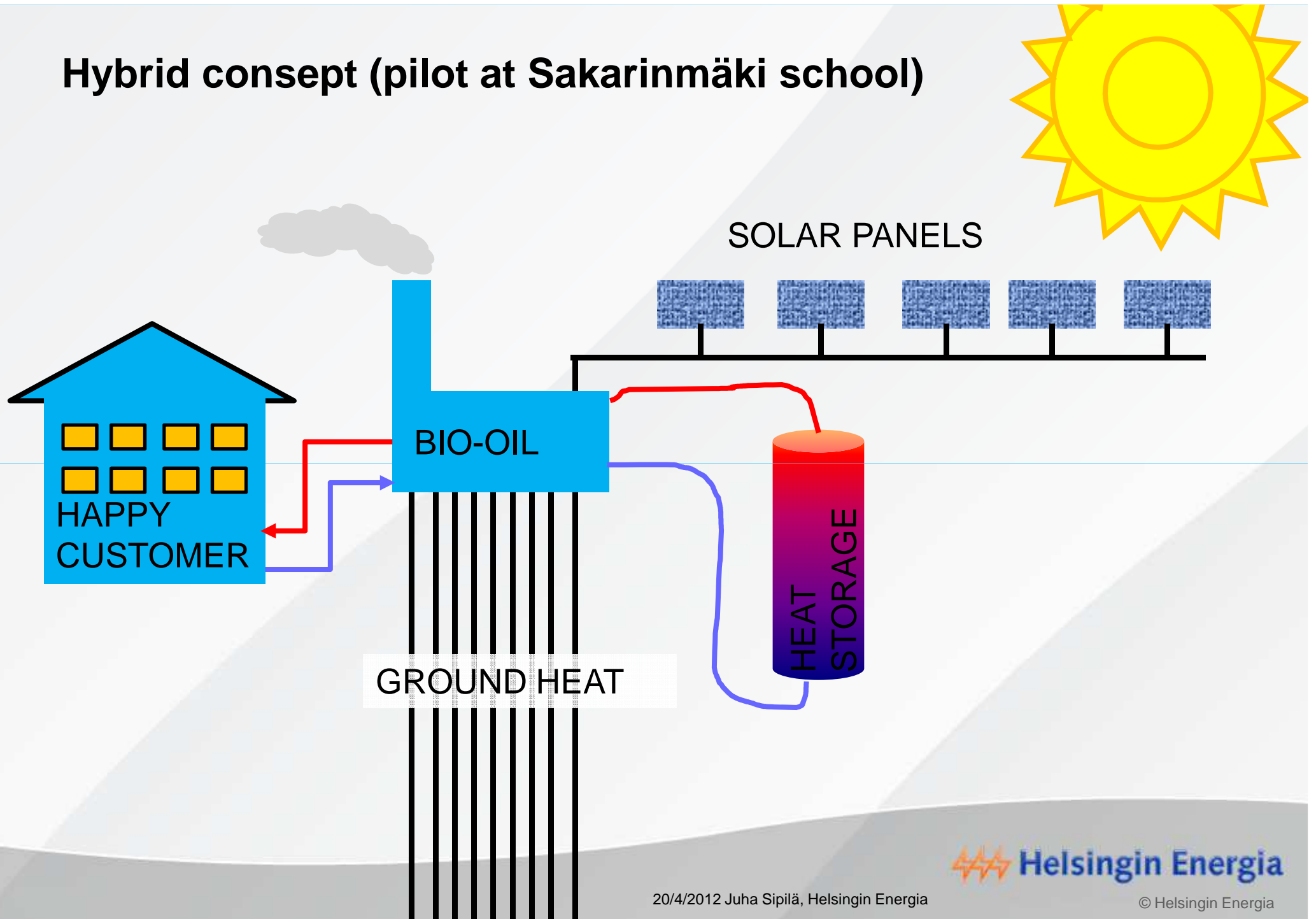


Case: Sakarinmäki school in new city part of Östersundom

Finnish and Swedish-speaking schools, nursery, recreational facilities, area:
5700 m²



Hybrid concept (pilot at Sakarinmäki school)



Future

- Real estate nominal energy consumption will decrease. City growth will compensate the total delivered energy to stay steady or grow
 - City of Helsinki grows at a rate of about 5000 new apartments per year
 - Ongoing new city district planning projects
- Forthcoming building regulations will lead to
 - Lower nominal heat demand
 - Increasing demand for comfort cooling in summertime

New products to be launched

- District heat
 - New hybrid solutions
 - CO₂ free production from renewable sources
- District cooling
 - New light and economic alternatives for residential buildings
- Power grid connection
 - Self healing with grid automation
 - Enhanced reliability and uptime by active feed from two substations
- Electricity with variable tariff
 - Private households can take the advantage of demand response
- Electric vehicle charging infrastructure



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Helsinki has set a target to be
CO₂ neutral by 2050

Thank you!

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