



efeu

Efficient Energy Use

Energy Systems' analysis by Solvo[®] Regio

Solvo[®] Regio analyse revealed a huge potential to increase profitability, reduce fossil fuels usage and halve existing CO₂ emissions in Keski-Uusimaa district heating network.

Summary

Solvo[®] Regio software was used to simulate different case studies of regional energy efficiency solutions in Keski-Uusimaa district heating (DH) network.

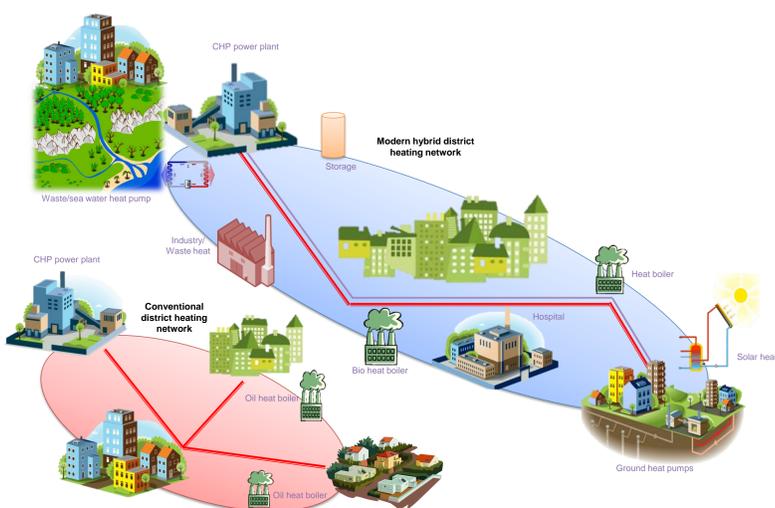
Connecting Järvenpää-Tuusula DH network to Kerava DH network with a new transfer line would decrease fuel consumption by 9 %, decrease oil/gas consumption by 50 %, decrease CO₂-production by 40 % and increase the profit by 6 %. Most of the benefits of the new transfer line comes from the summer time operation when only one CHP plant is needed in the area.

		Transfer line capacities		
		base	20 MW	40 MW
Fuel consumption	GWh	1105	1066	1010
- change	%		-4 %	-9 %
Bio fuel consumption	GWh	1087	1057	1001
- Biofuel proportion	%	98 %	99 %	99 %
Natural gas/Oil consumption	GWh	18	9	9
- Natural gas/Oil prop.	%	2 %	1 %	1 %
Efficiency	%	82 %	85 %	89 %
- change	%-unit		3	7
CO₂ production	t	3801	2256	2279
- change	%		-41 %	-40 %
Fuel price, incl. Tax	rel.	100	94	89
Heat sales (net)	rel.	100	100	100
Electricity sales, tot.	rel.	100	99	97
Energy cost price (€/MWh)	rel.	100	93	86
PROFIT	rel.	100	103	106

Main results of the Järvenpää-Tuusula case study

Background

As a result of climate change requirements and sustainable development a large change is taking place globally in energy systems. EFEU-project focused on the research of regional energy efficiency solutions and service concepts.



Example of energy system transformation

Solvo[®] Regio software is an Excel based tool to be utilized in the regional energy system analysis. It gives a sophisticated estimation how different parameters (heat demand and price changes, availabilities, etc.) effect on energy system technically and economically. Model includes heat and electricity productions. Calculation is carried out on hourly level for a period from one day to several years.

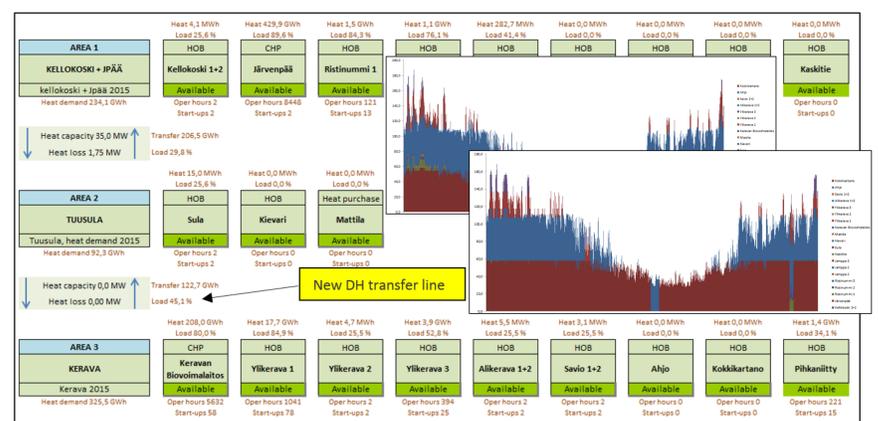
Regional heat demand and electricity price on hourly level are the key input data for the model. Also heat purchase and sell to nearby regions or industry are possible options. The main target in the energy system analysis is a cost effective production portfolio. Energy savings and climate effects are tightly involved in the analysis. Also impact of future investment options can be studied.

Case study – Keski-Uusimaa

Solvo[®] Regio was used to simulate six different case studies of regional energy efficiency solutions in Keski-Uusimaa district heating (DH) network.

One of the studied cases was to connect Kerava district heating network to Keski-Uusimaa through Tuusula by a new DH transfer line. Järvenpää CHP is the biggest power plant in these areas, located in Keski-Uusimaa DH network. Järvenpää-Tuusula DH network has also 11 gas and oil fired HOB plants. Kerava DH network has one CHP plant and several gas and oil fired HOB plants. In addition they have one biomass fired HOB.

The effect of different transfer line capacities (10, 20, 30 and 40 MW) was studied. As a result both CHP plants will be operated as previously in the winter time. Most of the benefits of the new transfer line comes from the summer time operation when only one CHP plant is needed in the area and the decreased oil/gas consumption in the winter time.



Solvo[®] Regio model of Keski-Uusimaa district and its results

More Information

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