KeepWarm
Renewing district heating

Example of district heating system developement in Latvia.

Fortum Jelgava Ltd./THERMOS project “ Thermal energy resource modelling and optimisation system””

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About Fortum

Driving the change for a cleaner world

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Who we are

Our business

We are an energy company providing our customers with electricity, heating and cooling as well as smart solutions to improve resource efficiency.

Our core operations

- Hydro and nuclear
- Combined heat and power production
- Circular economy
- Energy-related products and expert services for consumers and businesses.

Our sustainable focus

96% of our electricity production is CO_2 free in the EU, 59% in all operations. 2/3 of our power production is hydro and nuclear.

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Fortum in brief

Core operations in 10 countries and expert services **globally**

8,200 experts worldwide

2.3 million electricity customers in the Nordics and Poland

Sales 2019 **5.4 billion** EUR

Key markets: The Nordic and Baltic countries, Russia, Poland and India

26 CHP, condensing and nuclear power plants

Growing into gigawatt scale in **solar & wind**

132,000 shareholders at the end of January 2020

155 hydropower plants (incl. partly owned plants)

Heat supplier in **24 cities**

5 waste-to-energy plants

Listed on the Helsinki Stock Exchange since **1998**

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Fortum in Jelgava

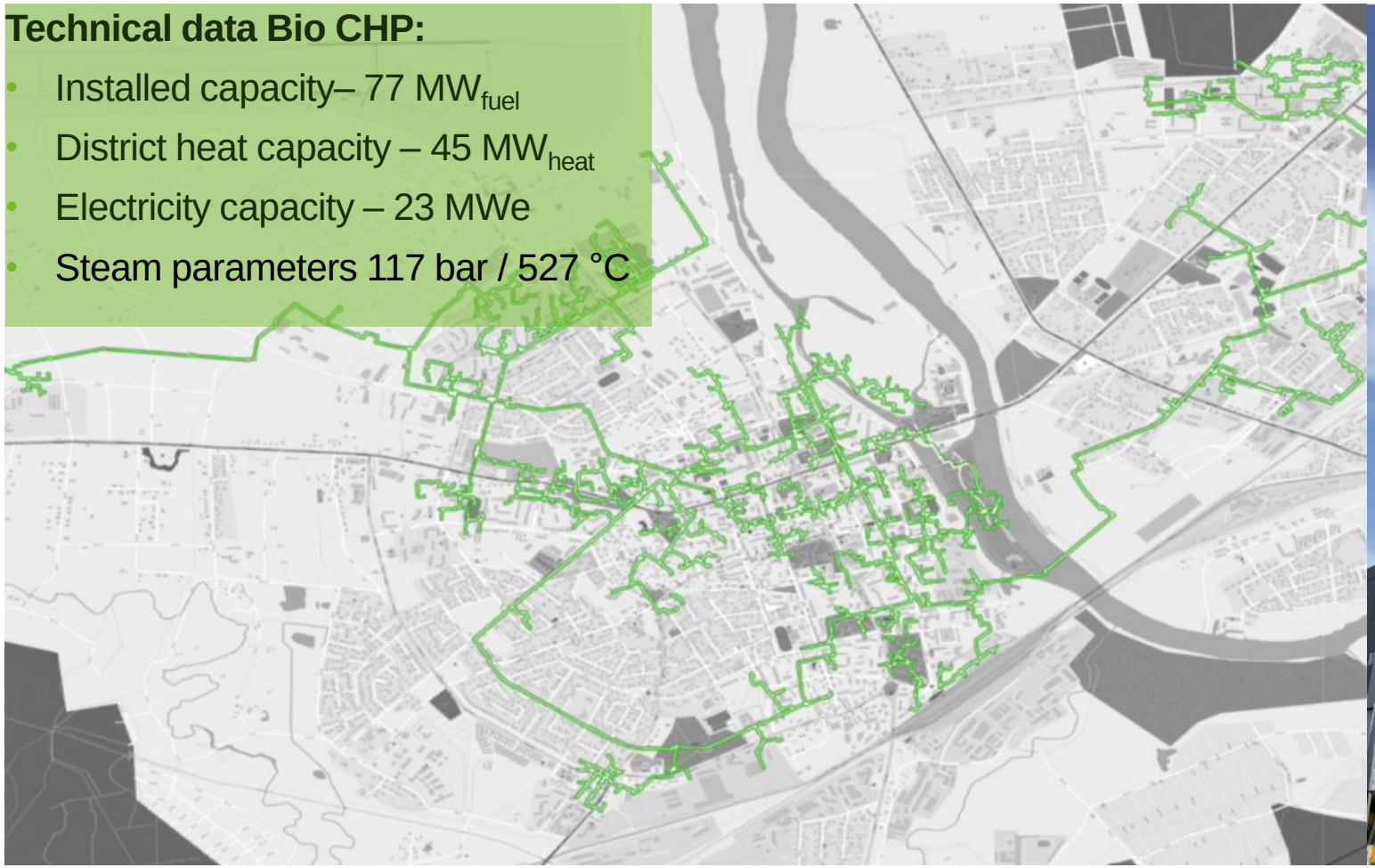
Installed heat capacity in CHPs	45 MW biomass
Installed capacity in HOBs	109 MW (natural gas)
Installed power capacity	23 MW biomass
Power trading	Nord Pool Spot and large industrial end-consumers
Annual heat sales	175 GWh
Annual power sales	120 GWh
Heat losses in the network	16 %
Length of DH network	75 km
Heat customers	16 000 households or 365 buildings, 172 B2B customers
Fuel	80% biomass, 20% natural gas, peat
Employees	69

Fortum in Jelgava – In commercial operation since Sep 2013

The largest bio fueled combined heat and power plant in Latvia

Technical data Bio CHP:

- Installed capacity– 77 MW_{fuel}
- District heat capacity – 45 MW_{heat}
- Electricity capacity – 23 MWe
- Steam parameters 117 bar / 527 °C



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Products and services offered in Jelgava

Heat energy

(16 000 households or 420 buildings, 172 B2B customers)

Hot running water

Maintenance of individual heat substations

(around 420)

Invoicing

(around 15000)

Distant meter reading (around 650)

Electricity

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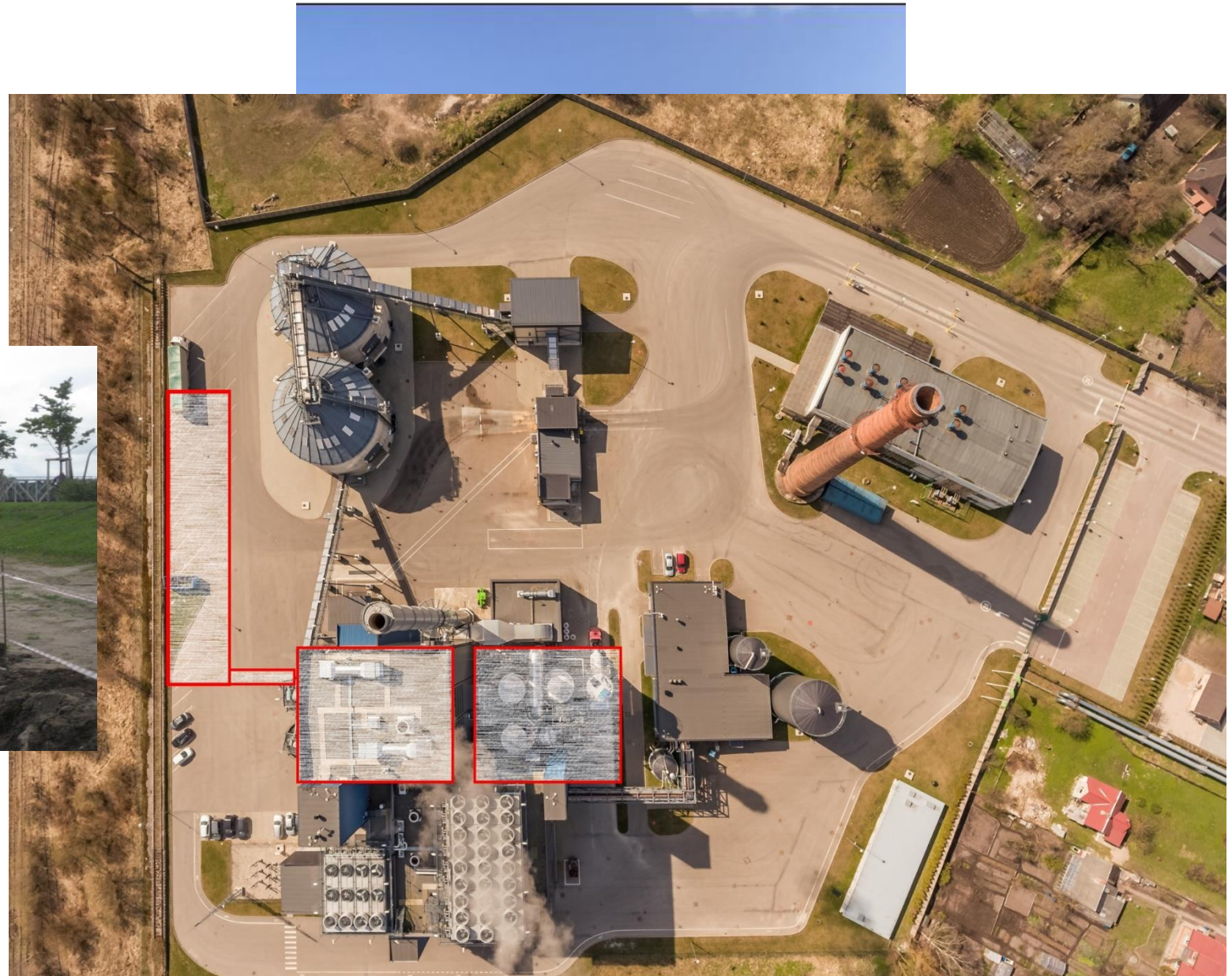
How we can improve performance of district heating?

- Technical improvements
- Fuel
- Network efficiency and density



What is limiting developement of network:

- Lack of resources
- Expensive and long design process when outsourced
- Expensive and complicated software
- Focus on specific cases

Where and how to focus?

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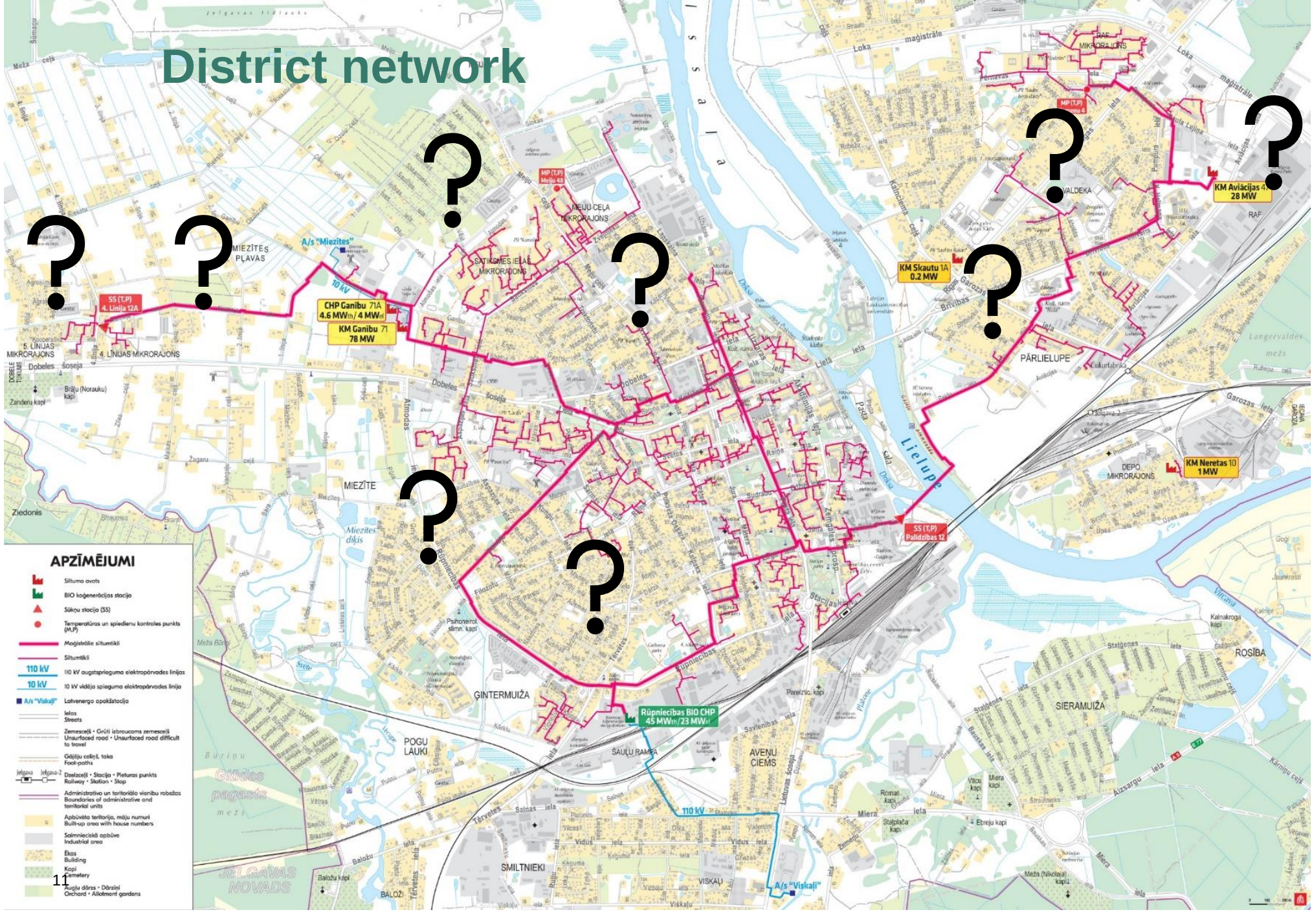
District network



Thermos tool can help

The overall aim of the THERMOS project is to provide the methods, data, and tools to enable more sophisticated thermal energy system planning **rapidly and cheaply**.

THERMOS aims to accelerate the development of new low-carbon heating and cooling systems across Europe, and **enable faster upgrade, refurbishment, and expansion of existing systems.**

Project partners

In support of

Supported by

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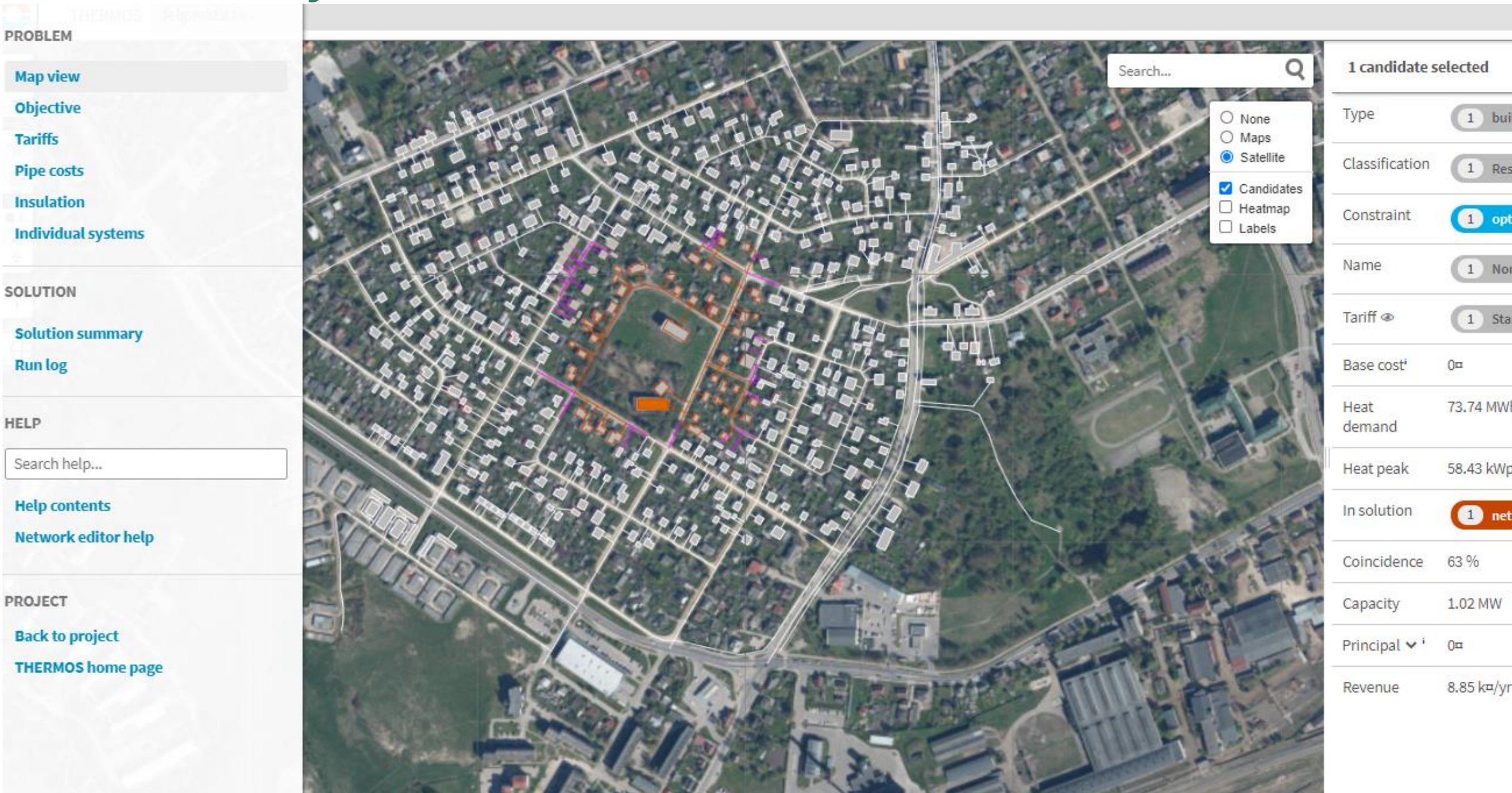
What is beauty of Thermos?

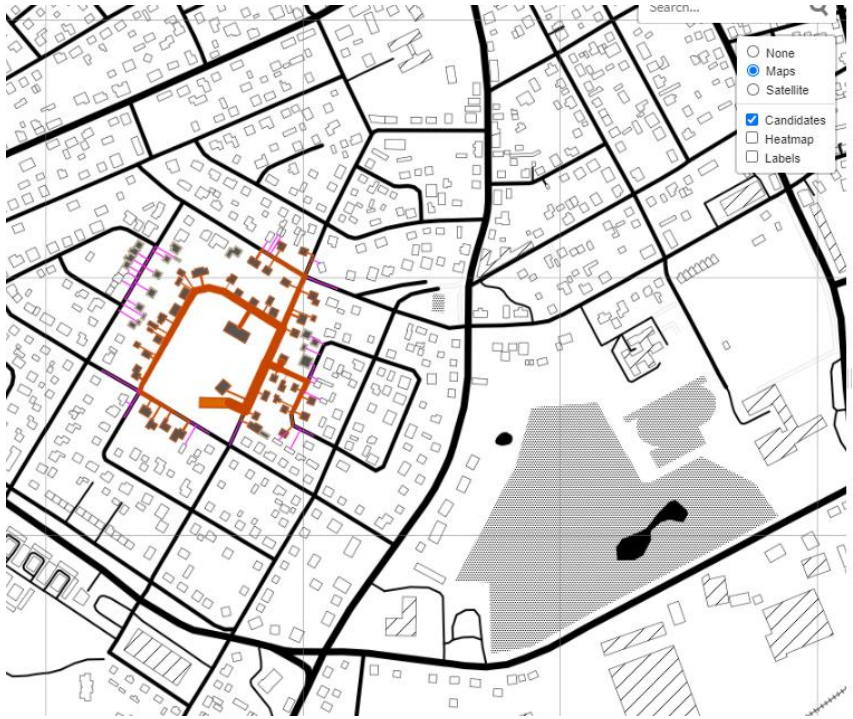


What data is needed?

- Buildings and network (GIS or Open Street Maps + Lidar (optional))
- Piping costs
- Tariff
- Production costs and financial inputs
- Emmisions

What output you get?

- Optimal network layouts
- Demand estimates
- Total analysis of solution



Type 146 path
Classification 139 Residential
Constraint 208 optional
Name 16 Riņķa iela, 21 Ausmas iela
Tariff 64 Standard
Civils 146 Hard
Length 2.24 km
Base cost 341.46 k¤
Heat demand 1.2 GWh/yr
Heat peak 2.16 MWp
Lin. density 537.86 kWh/m
In solution 47 impossible, 144 network, 19 no
Coincidence 85 %
Capacity 1.02 MW

Solution Summary

Display Options

Capital costs: (•) Total ( ) Principal ( ) Present value
Other costs: (•) Total ( ) Annual ( ) Present value

Cost summary | Network | Individual systems | Insulation | Emissions | Optimisation

Item	Capital cost (¤)	Operating cost (¤)	Operating revenue (¤)	NPV (¤)
Pipework	264.27 k	--	--	-177.84 k
Heat supply	0	1.4 M	--	-835.34 k
Demands	0	--	4.53 M	2.7 M
Emissions	--	0	--	0
Network	**264.27 k**	**1.4 M**	**4.53 M**	**1.68 M**
Emissions	--	0	--	0
Individual systems	--	**0**	--	**0**
Insulation	--	--	--	--
Whole system	**264.27 k**	**1.4 M**	**n/a**	**-1.01 M**

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How we use tool in Jelgava?

- Within couple of hours we can make analysis for specific areas nearby existing network
- Data quality is enough good to make decisions on next steps.
- Similar experience in other cities

- Try yourself: https://tool.thermos-project.eu/

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