

Training Webinar 2: Creating Technical Zones and Scenarios with Online Tools

Introducing heat supply scenarios in THERMOS

1st March 2023



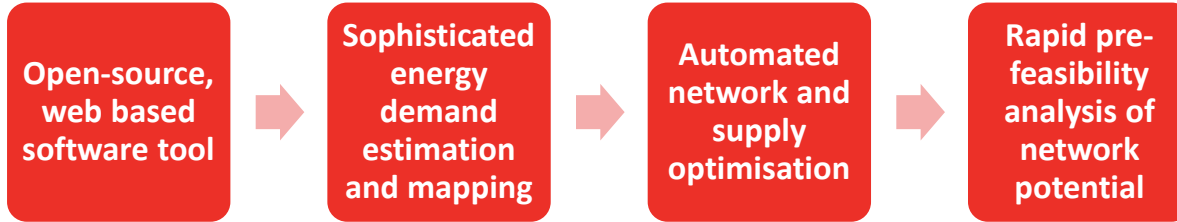
This project has received funding from the
EU's Horizon 2020 programme under grant
agreement no 101033706.



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Thermal Energy Resource Modelling and Optimisation System





1. Network scenario is defined (routes, demands and supply points)





2. Network heat supply point(s) is specified

Cost and capacity

Maximum capacity	<input type="text" value="2.0"/>	MW
Fixed cost	<input type="text" value="0.0"/>	κ€
Capacity cost	<input type="text" value="300.0"/>	€/kW
Annual cost	<input type="text" value="0.0"/>	€/kW
Supply cost	<input type="text" value="5.0"/>	c/kWh

Emissions factors

co2	<input type="text" value="0"/>	g/kWh
pm25	<input type="text" value="0"/>	mg/kWh
nox	<input type="text" value="0"/>	mg/kWh

Cancel

OK





3. Network is optimised according to objective

875 candidates selected

Type	602 path x 271 demand x 2 supply x
Category	9 groups
Name	279 groups
Constraint	874 optional x 1 required x
Tariff	273 Standard x
Edited	870 no x 5 yes x
Profile	273 Residential x
Civils	602 Hard (default) x
Length	5.33 km ¹
Base cost ¹	3.28 M ²
Heat demand	11.53 GWh/yr ¹
Heat peak ¹	11.66 MWp ¹
Lin. density ¹	2.16 MWh/m
In solution	875 network x
Coincidence	84,64 % ¹
Required	6.23 MW ¹



Default profile

This profile will be used for buildings where you have not set a profile: Residential

Day types

Normal weekday ✕
 Normal weekend
Winter weekday
Winter weekend
Peak day
+

Relative frequency: of 365 (or ~197 days per year) Time precision:

Press the = key to set all values in a row to the focused cell.

Heat profiles

✕ Residential	3.54	4.52	4.07	3.44	3.26	3.82	3.58	2.17	1.11	0.76	0.65	0.67	0.64	0.6	0.78	1.39	1.83	1.8	1.56	1.32	1.08	0.79	0.58	1.54
✕ Commercial	0.36	0.29	0.26	0.25	0.52	0.74	3.71	4.73	9.01	10.41	10.08	9.35	8.95	9.57	8.26	7.39	7.09	5.63	1.15	1.04	1	0.88	0.52	0.39
✕ Flat	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

+

Fuels

Prices — c/kWh

Grid offer	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
✕ Electricity	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
✕ Natural gas	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

+

CO₂ Emissions — g/kWh

✕ Electricity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
✕ Natural gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1. Set up demand profiles



2. Set up supply technologies

Supply technologies

	Technology	Lifetime	Fuel	CHP	Capacity	Power/fuel	Heat/fuel	Substation	Capital cost			Operating cost		
		yr		<input type="checkbox"/>	MW	%	%		k€	€/kWp	€/kWh	k€	€/kWp	€/kWh
✗	Heat pump	25	Electricity	<input type="checkbox"/>	2.0	n/a	300.0	A substation	10	300	0	0	0	10
✗	Natural gas	15	Natural gas	<input type="checkbox"/>	1.0	n/a	100.0	None	0	150	0	0	0	5

Add plant

Substations

	Name	Headroom	Alpha
		MW	%
✗	A substation	40	80.0

Add substation

Storage technologies

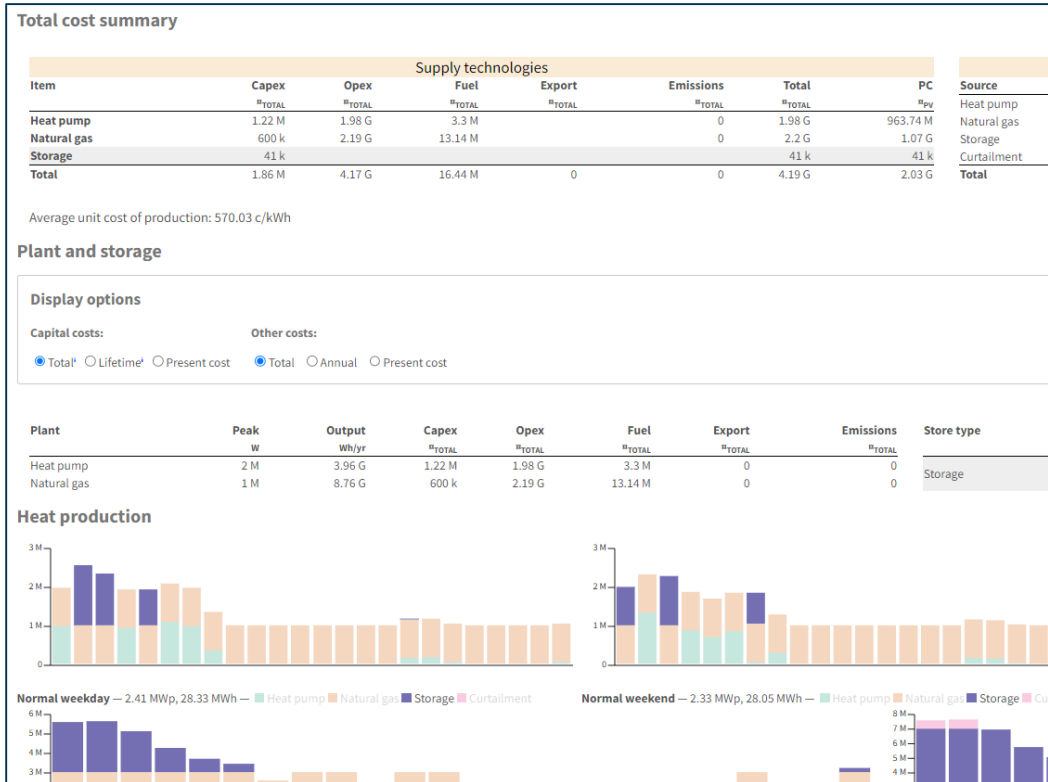
	Name	Lifetime	Capacity		Efficiency	Capital cost		
		yr	MWh	MW	%	k€	€/kWp	€/kWh
✗	Storage	50	40.0	4.0	90	1	10	0

Add storage



3. Optimise a solution

➤ Can then iterate with network optimisation



Try out the tool at: <http://action-heat-thermos.cse.org.uk/>

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