Madaltemperatuurilise võrgu arendamine kaugküttes

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Mis energialiike me kasutame?

Eesti / Euroopa Liit

Elektrienergia

Transport

Soojusenergia

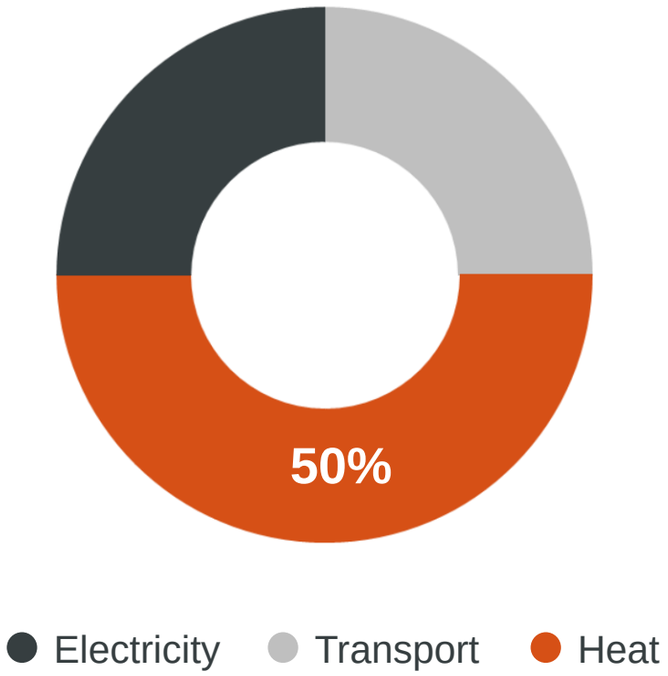
Küte, soe vesi, tööstus

Jahutusenergia

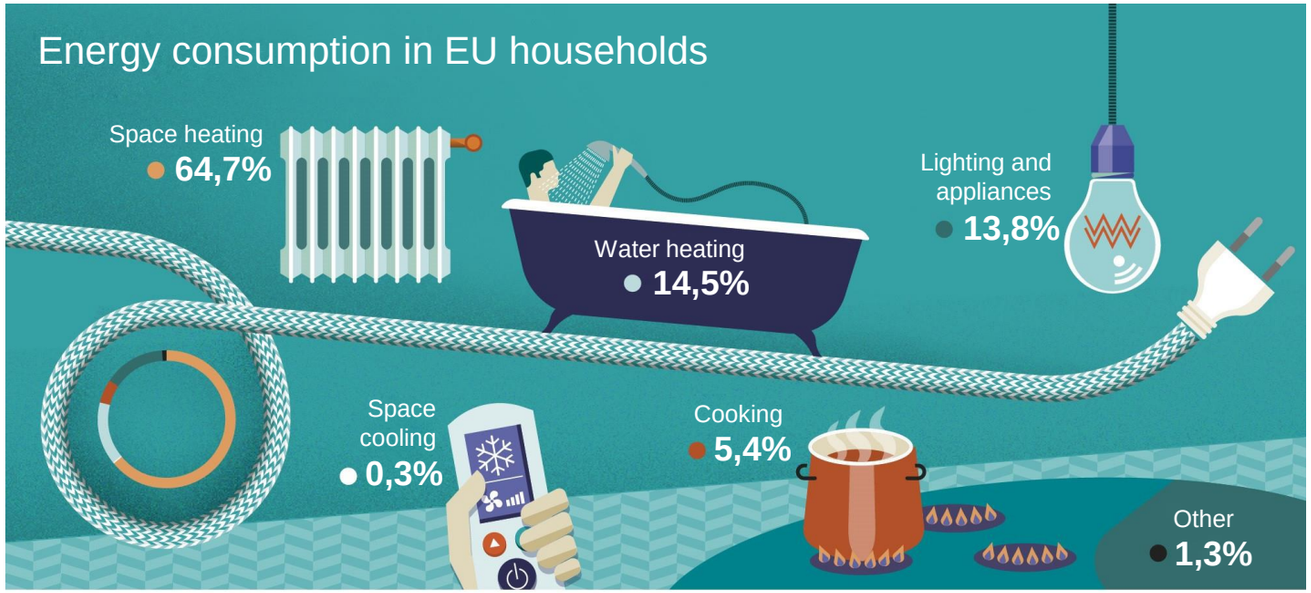
Jahutus, tööstus

Energia kulu kodumajapidamistes

Heating & Cooling represents **50%** of the EU total annual energy consumption



Heating & Hot water, in EU houselohds account for **79%** of total final energy use



ec.europa.eu/eurostat

Vaid Malta ja Küpros omavad suure jahutusenergia osakaalu

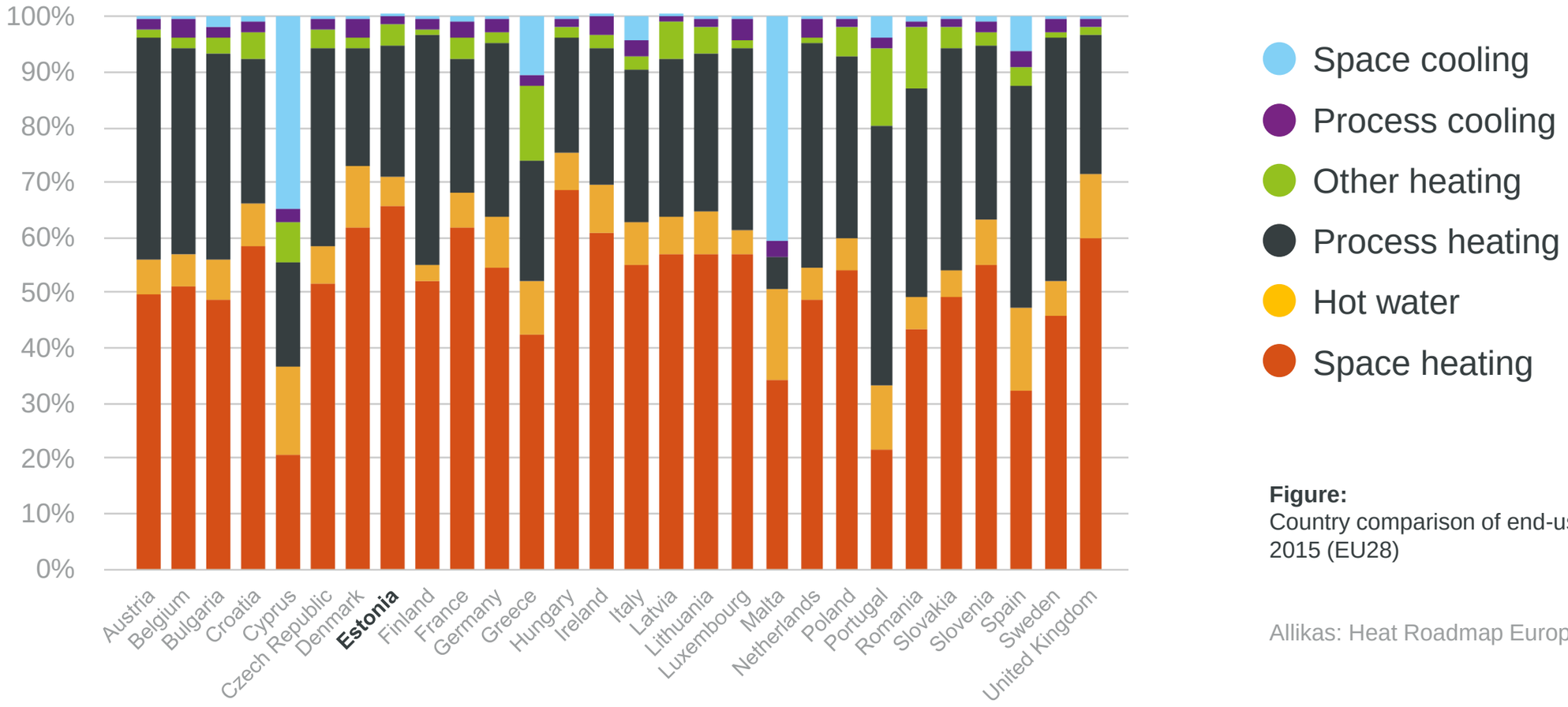


Figure:
Country comparison of end-use in 2015 (EU28)

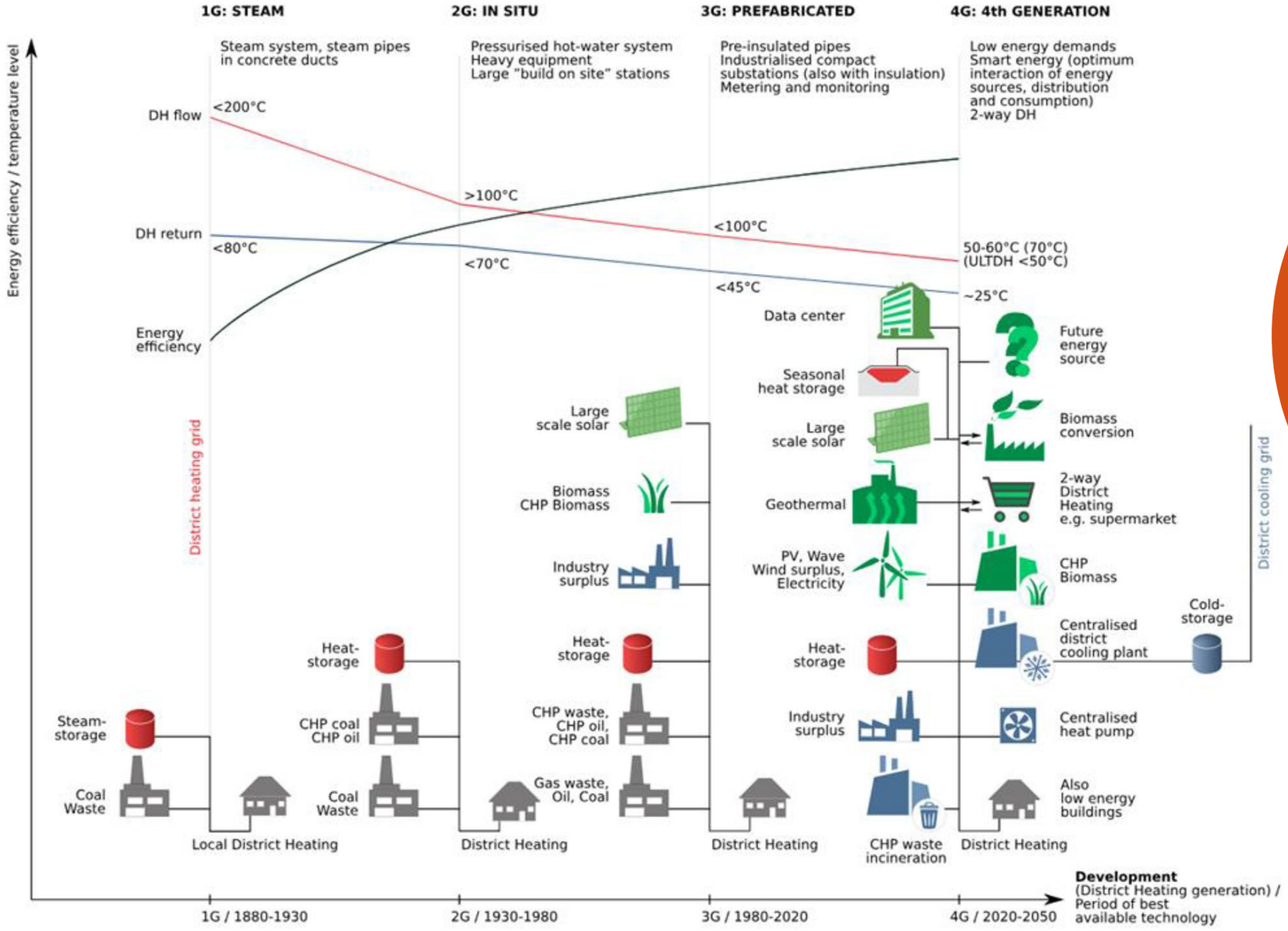
Allikas: Heat Roadmap Europe

EU planeeritud meetmed soojusenergia valdkonna dekarboniseerimiseks

Everywhere	Urban Areas	Rural Areas
Heat savings	District Heating Networks	Primarily Electric Heat Pumps
Balance Savings vs. Supply	High Density Areas	Smaller Shares of Solar Thermal & Biomass Boilers
30-50% of Total Heat Demand	40-70% of Total Heat Demand	30-60% of Total Heat Demand

Allikas: Heat Roadmap Europe

Kaugkütte põlvkonnad (1, 2, 3, 4)



Allikas: Ajakiri „Energies“

Paekalda piirkond

17 ha

Arendus 180 000 m²
37 hoonet (korterelamud)

Põrandaküte + soe vesi
Soojuslik võimsus 15 MW

LOW TEMPERATURE DISTRICT HEATING NETWORK ENERGY CASCADE CONNECTION TO RETURN LINE OF HIGH TEMPERATURE DISTRICT HEATING NETWORK

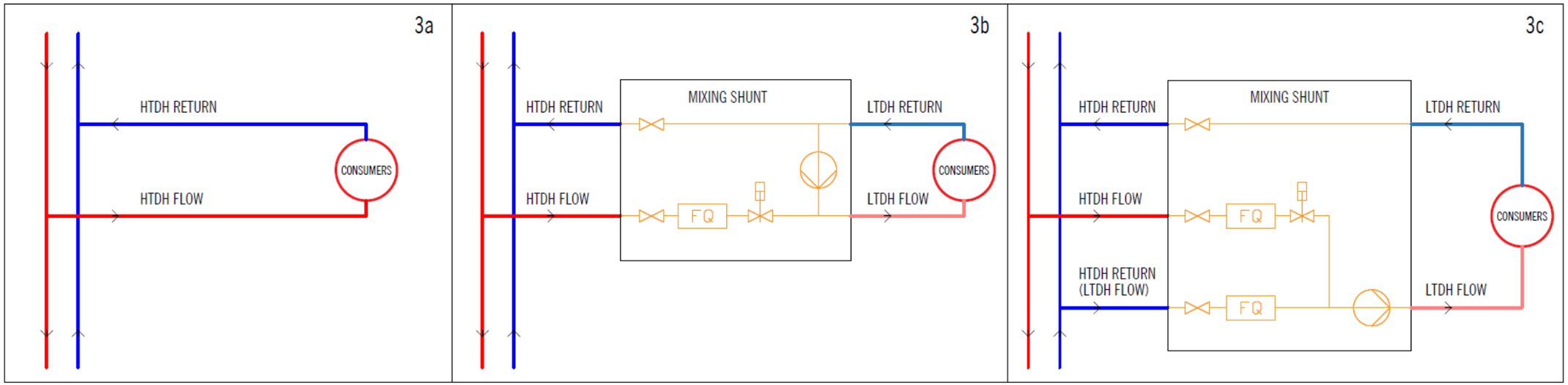
I.Krupenski, A.Volkova, A.Ledvanov, E.Latõšov, A.Hlebnikov, K.Lepiksaar, V.Mašatin
Tallinn University of Technology, HeatConsult OÜ, Utilitas Tallinn AS

Paekalda *case study*

Ettekanne:
Smart Energy Systems konverentsil
Kopenhagenis 2019

Teadusartikkel (1.1):

Tehniline lahendus



HTDH: 115 / 70 °C

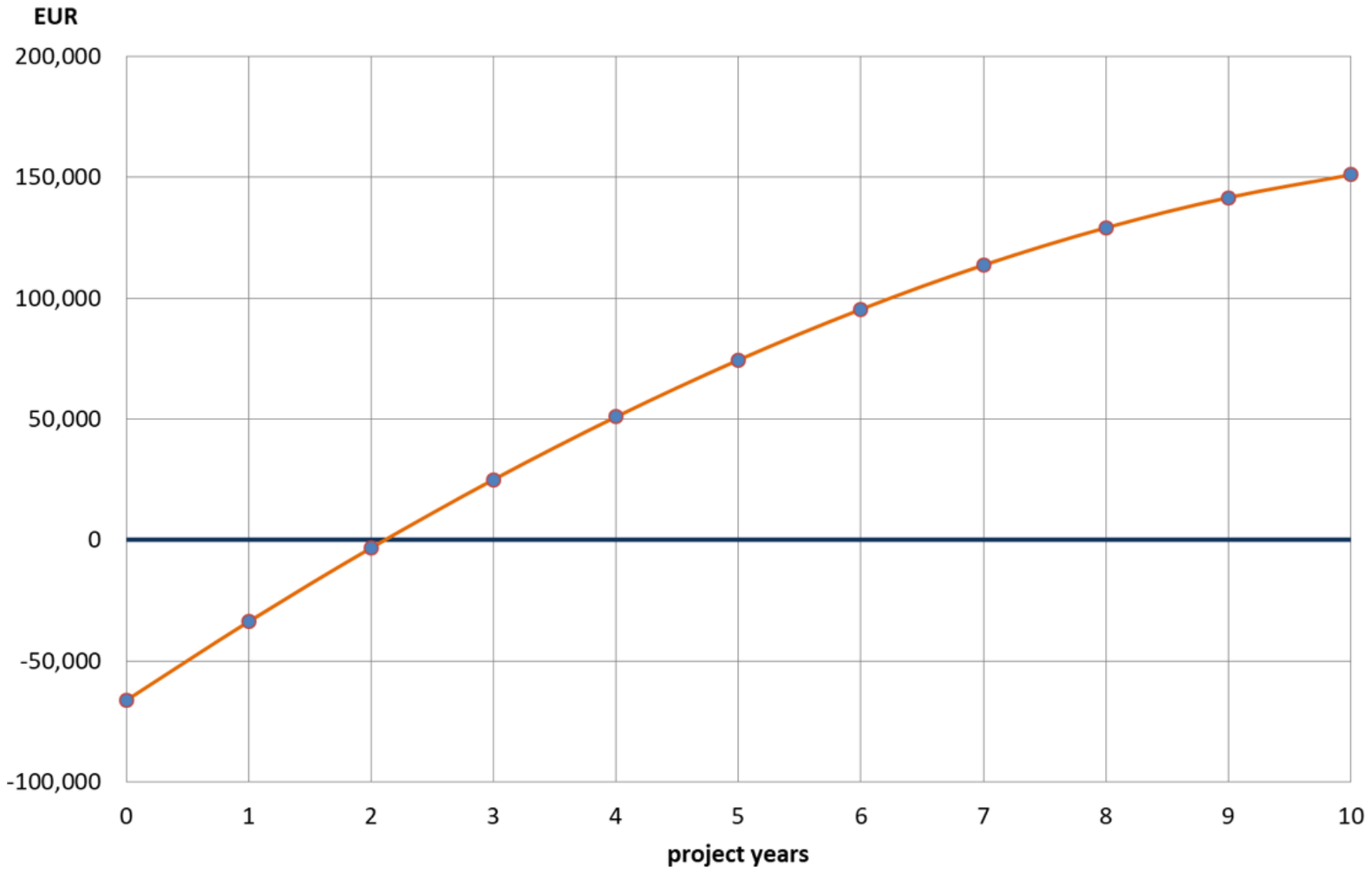
LTDH: 65 / 35 °C

Table 4: Benefits due to 2nd option implementation

Benefit	Amount	Price	Income
Heat losses decrease in large DH networks	207 MWh	35 EUR/MWh	7 245 EUR
Electricity generation increase	400 MWh_{el}	90 EUR/MWh	36 000 EUR
Heat recovery increase in FGC	1015 MWh	35 EUR/MWh	35 525 EUR
Heat loss savings in new LTDHN sector	31 MWh	35 EUR/MWh	1 085 EUR
		Total	79 855 EUR

Option	Piping without fittings (EUR)	Fittings (EUR)	Piping with fittings (EUR)	Pumping station (EUR)	Heat exchangers (EUR)	Total
1	*200,246*	*103,922*	304,168	0	41,050	345,218
2	*228,488*	*56,396*	284,884	49,100	77,514	411,498

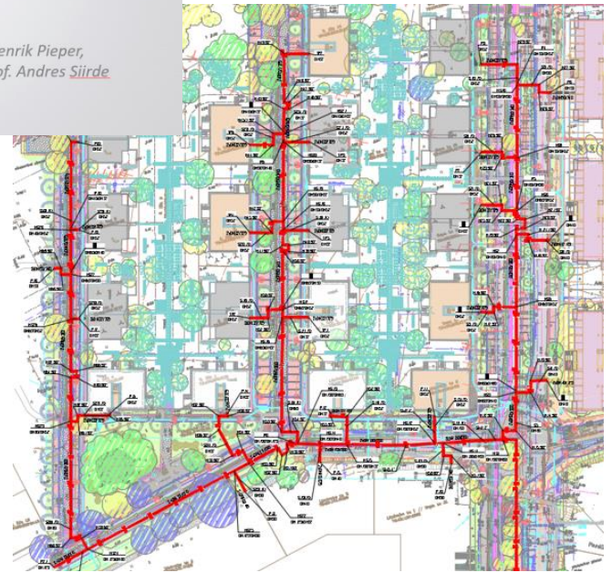
Tulemused

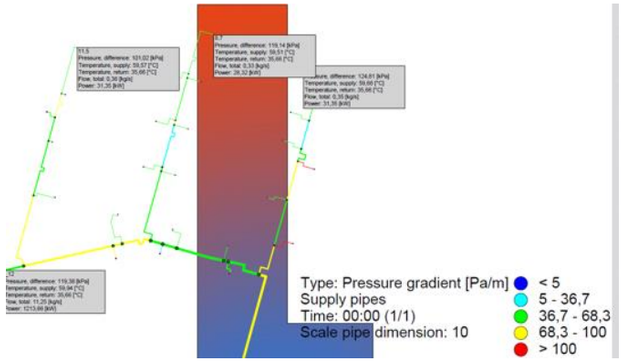


The return temperature of the main network will gradually decrease by approximately **0.39 °C** from 49.7°C to 49.31°C throughout the heating season

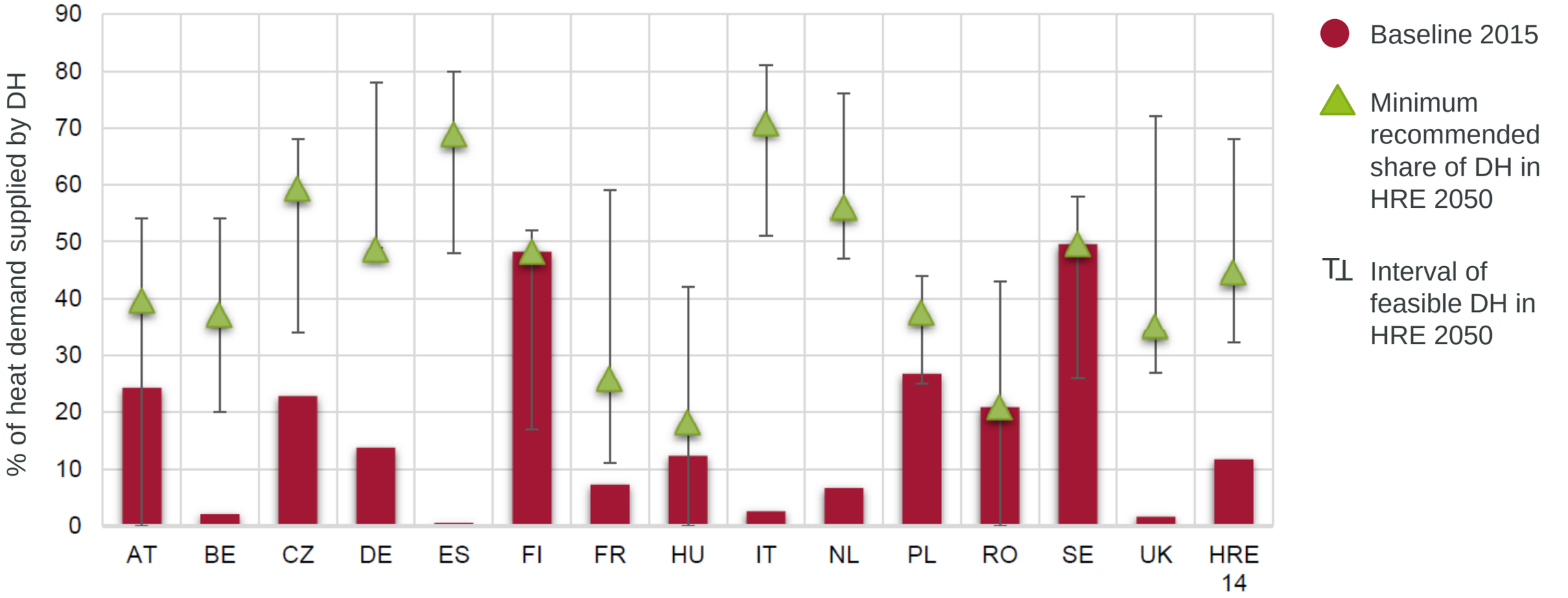
Kopli liinide piirkond

- Kopli liinide piirkonna kaugküttevõrk projekteeritud temperatuurigraafikule 60/35
- Soojusenergia allikaks: 1.etapp lokaalne gaasikatlamaja, 2.etapp merevee soojuspump
- Soojuskaod ca 40% väiksemad võrreldes kohaliku soojusvõrgu temperatuurigraafikuga 95/55



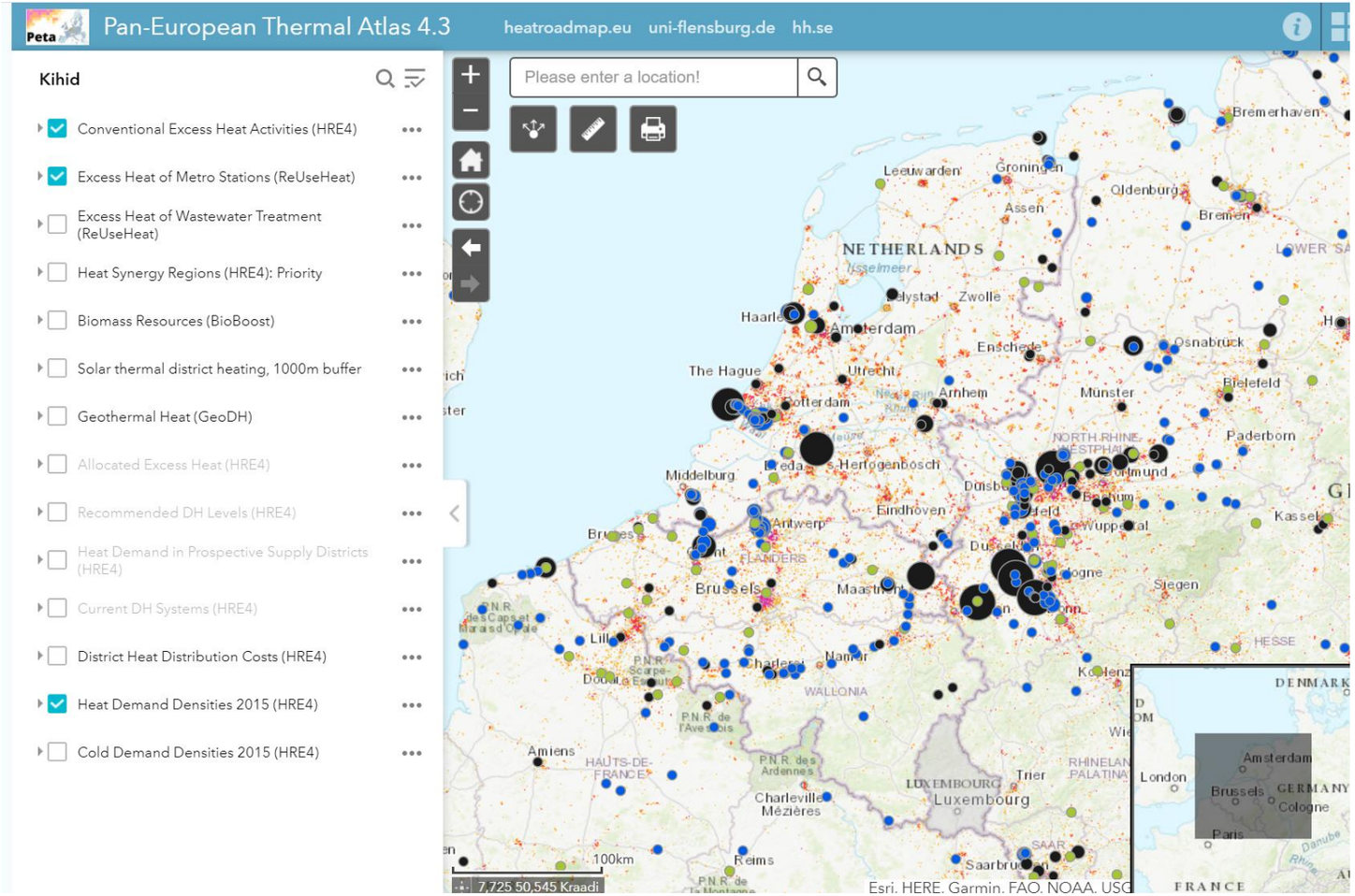


Kaugkütte võimalik osakaal EU riikides



Allikas: Heat Roadmap Europe

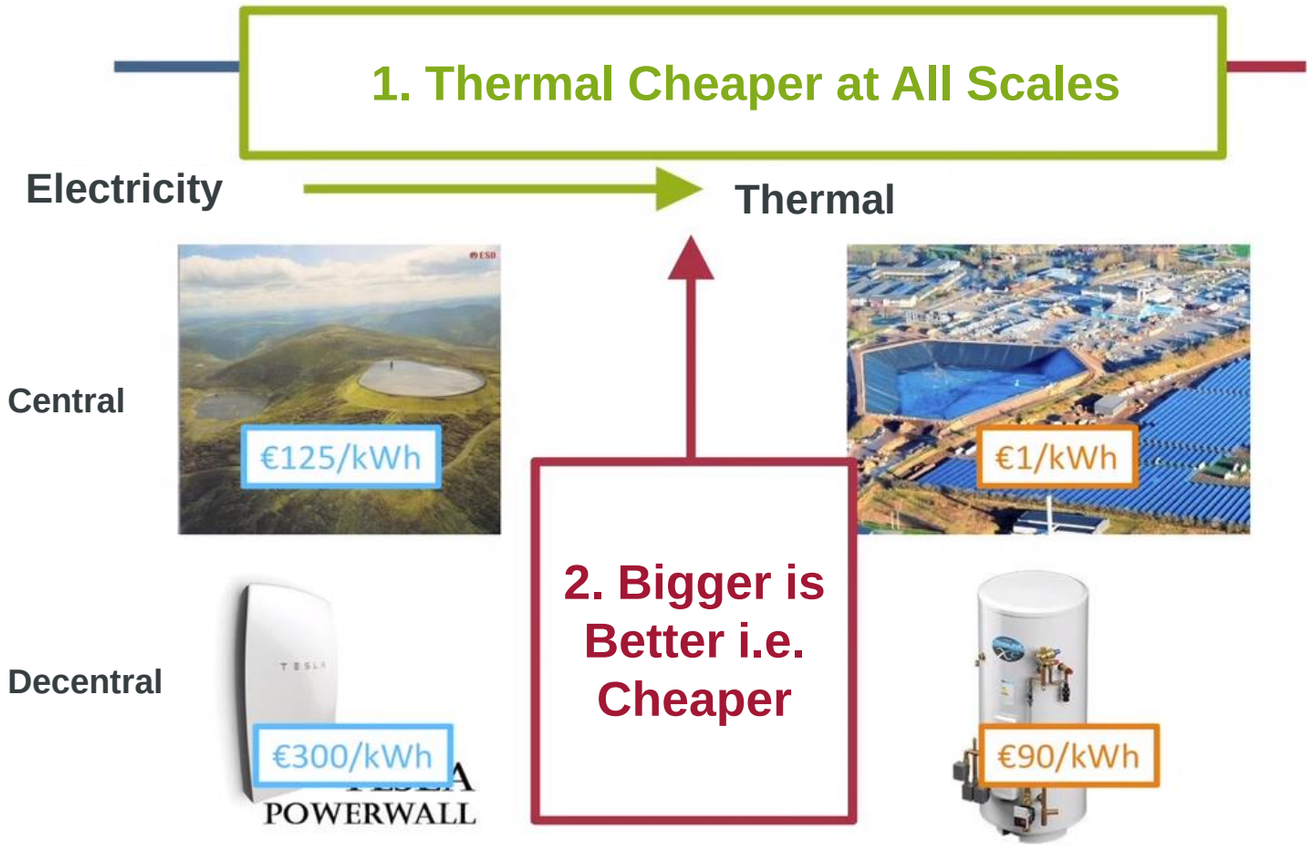
Potentsiaal madaltemperatuurilise kaugküttevõrgu ja jääksoojuse kasutamiseks



www.heatroadmap.eu/peta4.php

Kaugküte aitaks kaasa energiasüsteemi tasakaalustamiseks

Energy Storage Comparison



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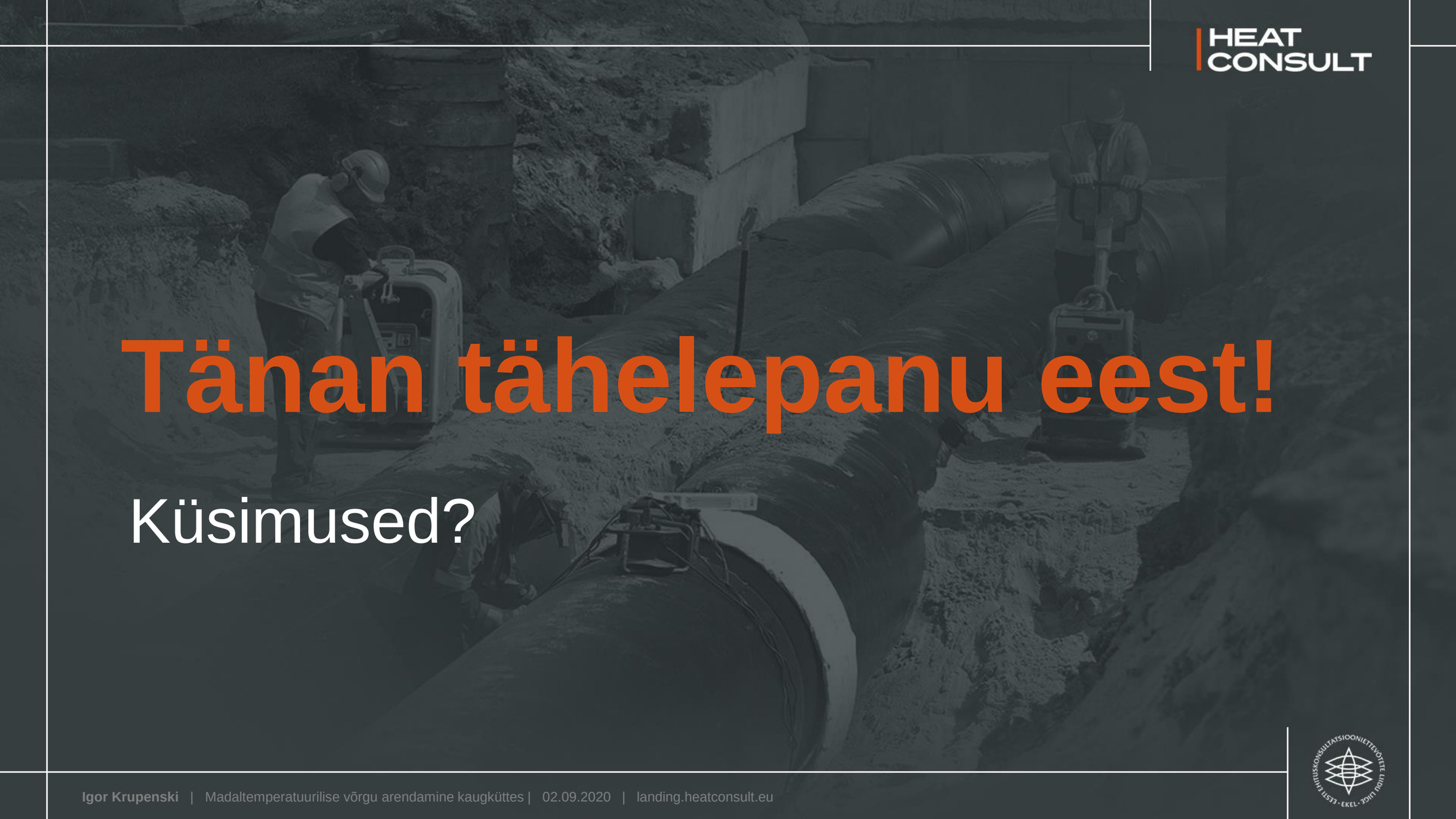

Tänan tähelepanu eest!

Küsimused?