

DEVELOPMENT SCENARIOS OF ESTONIAN DISTRICT HEATING REGIONS

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CHARESTERISTICS OF DH REGIONS

- 145 regions have been analysed
- from 0.25GWh to 1 585 GWh
- medium sales 225 GWh
- price ~53 €/MWh



LENGTH OF DH REGION PIPES



CHANGES





Consumption will be decreased by 30% in 2030(Estonian Energy development plan)

- renovation of existing building
- new building are nearly zero energy

Heat production in Tallinn district heating region: forecasts and reality





- Collected data: yearly relative heat losses, length and average diameter of the networks, the share of preinsulated pipes, supply and return temperature
- Assumptions
 - All old pipes will be renovated and replaced by pre-insulated pipes
 - Supply and return temperature will be reduced



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50% to 80%

SHARE OF PRE-INSULATED PIPES



*V.Mašatin, E.Latõšov, A.VolkovaEvaluation Factor for District Heating Network Heat Loss with Respect to Network Geometry, Energy Procedia, 95, 2016



current after renovation after renovation& toC lowering

Heat losses in district heating networks with length 1 000...10 000 m



50%

45%

40%



Fuel consumption for heat generation, TJ





5th International Conference on Smart Energy Systems

WHY CANT BE REPLACED

- Peat production -7 DH regions
- Oil shale power plant -1 DH region
- Shale oil production plant: waste heat /gas 6 DH regions
- Biogas -2 DH regions





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RESULTS



- **a-** current situation
- **b-** consumption decrease
- **c-** consumption and heat losses decrease
- d- consumption, heat losses decrease and efficiency increase
- e- d + fuel replacement if possible

Wood chips



📕 Peat



🗖 Oil

SHARE OF CARBON NEUTRAL DISTRICT HEATING REGIONS (145 DHR)



CONCLUSSION

- Heat consumption reduction in building and network sector can make DH region carbon neutral without changes in heat production
- Wood conversion (boilers and CHP) is still the priority option for sustainable DH in Estonia
- More then 1/3 of district heating regions in Estonia are already decarbonized
- When due to consumption and heat loss reduction, there is still need for low capacity peak boilers it will not be replaced and fossil fuel boilers remain for reserve and peak loads
- Based on collected data (for mobile app) regarding existing situation generalised approach has been developed for calculating parameters, needed for app module

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