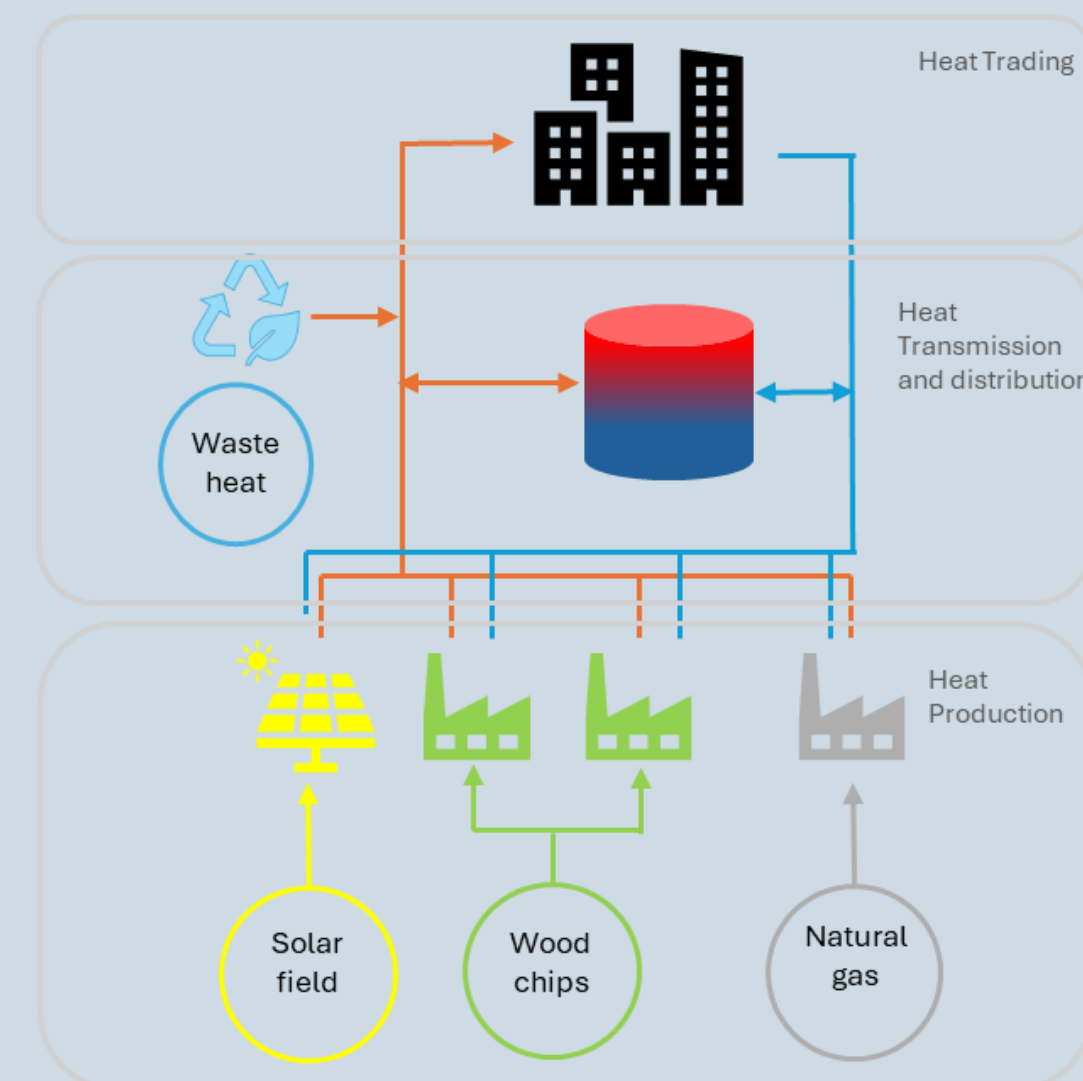


Decarbonisation of the heating sector is a key challenge for the European Union to achieve its ambitious goal of becoming the first climate – neutral continent in 2050.

- Decarbonisation the heating sector is about reducing fossil fuel consumption, finding new scenarios based on renewables and restructuring the operation of the district heating system.

- Recovering and integrating waste heat into the district heating system has an enormous potential to meet the heating needs of buildings through non –combustion technologies while reducing carbon emissions.



Heat tariff Pricing model

- The waste heat from urban sources is advantageous because they are located close to district heating networks and areas with high heat demand.

Introduction

Decarbonisation of the heating sector is also increasingly important in the context of the energy crisis, as it reduces dependence on fossil fuels. As district heating is widely used for space heating and domestic hot water, district heating plays an important role in the decarbonisation of the heating sector, as it allows the use of renewable energy sources and the integration of low-temperature waste heat from urban sources. Although the structure of the district heating sector in Europe is very heterogenous, Northern and Eastern Europe have the highest number of people receiving district heating, while Southern Europe has a rather number, probably due to climatic conditions and long traditions.

Methodology

The goal of this study is to develop different scenarios for the calculation of heat tariffs in a case study, where low – temperature waste heat from urban sources is integrated into district heating. The calculating of cooperating models is based on the approved Latvian heat calculation methodology.

Scenarios

The first scenario is based on the existing situation of analysed Case study. Almost 60% of the heat production is produced with wood chips, natural gas is used to cover the peak load about 13%, the rest is provided by recovery from the flue gas condenser, and the heat is produced with solar collectors.

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The second scenario assumes that the heat from the wastewater treatment plant is purchased as additional heat. The price at which to purchase the heat is determined by the investment required to integrate the heat into the district heating. The cost of purchased heat is determined by the following formula:

$$NVP = \frac{Cap.costs - Profit}{(1 + WACC)^n}$$

$$Profit = H_{tariff} \cdot WH - E_{HP}$$

In the third scenario, heat is produced using wood chips, natural gas, solar collectors and a flue gas condenser – as in the second scenario, some of the heat produced from natural gas and wood chips is replaced by waste heat from wastewater treatment plant, but unlike in the second scenario, the waste heat is not purchased, but the district heating company itself invests in the infrastructure to recover the waste heat and receives it at no extra costs. The cost of heat recovery is determined using the formula:

$$Invest = (Cap.costs * (1 + p_{roc})^n) / 15$$

Results

