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CARBON NEUTRALITY IN MUNICIPALITIES: BALANCING LOCAL AND CENTRALIZED RENEWABLE ENERGY SOLUTIONS

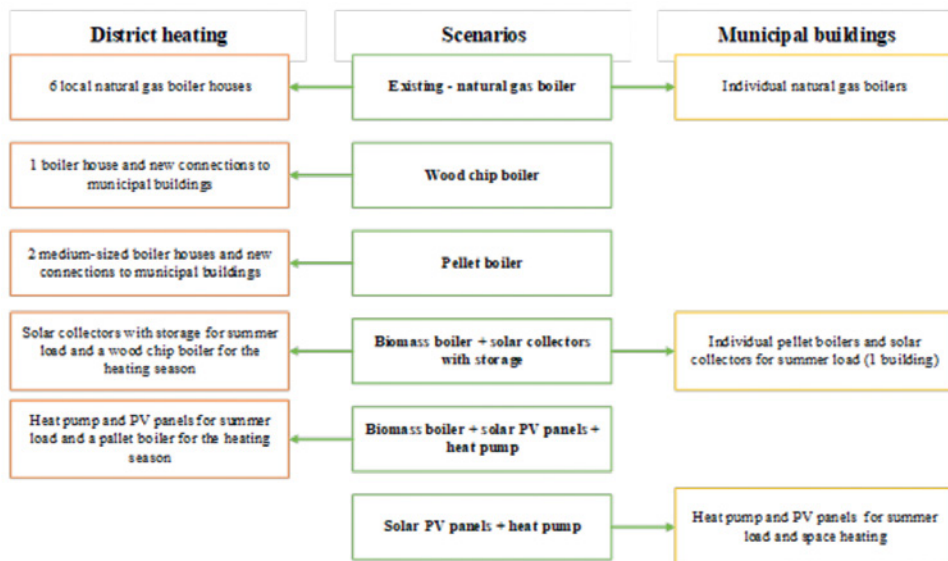
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Abstract – Carbon-neutrality in municipalities can be achieved by combining individual heating (IH) and district heating (DH) solutions involving the use of renewable energy sources (RES). Each approach has advantages and disadvantages, but the best solution depends on the specific circumstances of each municipality. As an environmentally friendly and efficient energy use, a decentralised heat supply contributes to achieving energy conservation and emissions reduction goals. Decentralised energy use, such as solar collectors with an accumulation system or biomass as a resource, reduces dependence on centralised heat generation and transmission. Often, the appropriate infrastructure for connection to DH networks has not yet been built. On the other hand, it is easier to make investments to construct proper infrastructure in the case of large-scale centralised heat supply. Moreover, a centralised heat supply with RES can provide more inhabitants with RES heat energy. Within the framework of the study, the possibilities of using renewable energy sources in one of the municipalities of Latvia – the Carnikava parish of Ādaži Municipality – are analysed. The study examines two scenario complexes including IH solutions in buildings or DH solutions with a centralised approach. The study evaluates several alternatives to increase the share of RES (e.g., solar collectors, biomass, heat pumps, etc.) in the centralised heat supply. To evaluate RES individual solutions in various municipal buildings, the study evaluates alternatives with different technical solutions that increase the use of RES in heat supply.

Keywords – *Carbon neutrality; district heating; individual heating; municipalities; renewable energy*



Development of scenarios for district heating and municipal buildings.