Rakli Kiinteistönomistajat ja rakennuttajat

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Artificial intelligence and digitalisation for energy – a roadmap

The Finnish Property Owners Rakli (Transparency Register id 727236253172-92) is association of Finland's most prominent owners of residential and commercial properties and infrastructure, property investors, largest cities in Finland, as well as construction clients. Our members include both private and public sector entities.

We wish to provide comments on the subject particularly from the standpoint of developers and property owners.

Transition towards intelligent networks and using waste heat

In Finland, the built environment accounts for nearly one-third of the energy consumption. Most of this energy is used for heating. Primarily, heating energy is distributed through hot water-based district heating networks operated by cities and municipalities.

Traditionally, energy for district heating networks has been produced using combustion-based solutions, and buildings have been seen solely as users of energy. However, nowadays these networks have widely transitioned to emission-free heat production methods, such as heat pumps, energy storage systems, utilizing waste heat from industry and data centers, as well as surplus renewable electricity. Advanced regional renewable energy solutions between buildings are also common in Finland.

In the future, we see great potential, for example, in utilizing waste heat from data centers. From a Finnish perspective, using energy to cool these centers is irrational when the waste heat could be directly used to heat buildings or stored in thermal energy batteries for later use. Waste heat from hydrogen production could also become a significant source of heating energy.

Artificial intelligence solutions are already being used to control these networks, and control systems have also been introduced at the level of individual buildings. Buildings offer various opportunities to be flexible in both heating and electricity consumption, and this should be taken into account in the roadmap. While the

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flexibility potential of a single building is usually quite small, the potential across the entire building stock, and among professional property owners, is significantly large.

Improving flexible energy solutions in buildings

In district heating, flexibility is often based on control solutions provided by energy companies. Electricity consumption flexibility is based either on market price-based control or on aggregator company control in reserve markets. From the perspective of property owners, a risk is that the financial benefits of flexibility are not shared in a way that makes investments worthwhile.

Another challenge in implementing flexible energy solutions in buildings is the lack of long-term visibility into the development of energy markets. Investment calculations are difficult, and solutions often involve uncertainties and risks. Investment subsidies targeted at flexible energy solutions in buildings would reduce risks for property owners and encourage the development of new solutions.

A challenge in EU regulation has been the lack of recognition of the role of Finnish and Nordic district heating and cooling networks, making tools like the SRI (Smart Readiness Indicator) framework unsuitable for use in Finland.

Flexibility increases total energy consumption

A significant regulatory challenge related to flexible energy use is that flexibility increases total energy consumption. The current Energy Efficiency Directive (EED) guides toward reducing total energy consumption, which in practice prevents investments in flexible energy use solutions that would enable increased renewable energy production.

Thus, EED architecture and targets to reduce energy consumption should be revised. The current level of energy efficiency in member states should be taken into account when defining new targets, and energy efficiency measures should include building services engineering solutions that contribute to energy savings. In rapidly decarbonizing regions like the Nordics, emission-free energy is becoming more available, making it unnecessary and inefficient to mandate largescale renovations to achieve modest energy savings.

Also, the increase in renewable energy production and electricity consumption, for example, due to the electrification of transport, has required and will continue to require major investments in transmission networks, both in the national grid and in regional distribution networks. As property owners, we are concerned about rising electricity transmission fees, and this should be addressed to prevent unreasonable costs.

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