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Policy recommendations for improved energy efficiency of the Finnish building stock

1) Large public and private real estate owners commit to improving energy efficiency of their building stock and thus take the role as trendsetters

Large real estate owners include the state, municipalities and institutional investors such as pension funds, real estate investors and insurance companies. As part of the coming profound health and social care reform, real estates will change ownership from municipalities to federations of municipalities. This will require new types of health care facilities in new locations and provides an opportunity to carry out energy efficiency measures. Through a commitment to improved energy efficiency large real estate owners create demand for energy efficiency services at a large scale and help pilot and scale up new solutions and thus stimulate markets.

State actors including the Finnish state, Senate Properties (state property management company), municipalities and public pension funds Keva (Local Government Pensions Institution) and Valtion eläkerahasto (VER, State Pension Fund) must commit to a 15% reduction in net energy use by 2030.

2) Providing emission-based incentives: Promoting energy efficiency through municipal zoning

The government enables municipalities to promote energy efficiency in buildings through zoning by adapting the legal framework. Consequently, the municipality will grant building sites to the house-builders who have the most energy-efficient house construction plans. Energy efficiency must be one of the primary criteria when a municipality or the Senate Properties tender the construction of a new building. Owners of a building that is upgraded to a certain ambitious standard of energy efficiency are allowed to build additional buildings on their site following the example set in France.

3) Access to the existing information and counselling services on energy efficiency solutions is improved for members of owners of single-family homes and 80 000 housing companies

Access to the existing counselling and information services on energy efficiency renovations will be improved through large-scale information campaigns coordinated by Motiva and funded by the state. This will increase the demand for energy efficiency renovations provided by companies and thus stimulate the markets.

4) Additional training for existing designers, architects and other professionals involved in energy efficiency renovations is provided and more people are trained to these professions

Designers, architects, project managers, plumbers, electricians, construction workers and other professionals who carry out the renovations need to update their know-how on the latest energy efficiency measures. An important thing that needs to be highlighted is that these actors need to cooperate during renovations during all phases of the construction to get an optimal result.

5) Energy form factors derived from primary energy factors are replaced with emission-based factors

The grading scale of buildings' energy certificates are based on energy form factors that must be changed to correlate with the emissions caused by different types of energy.

6) Ministry's Roadmap for life-cycle carbon footprint of new buildings must be adopted in 2023 and emission thresholds extended to existing buildings

Roadmap for reducing the life-cycle carbon footprint of new buildings currently prepared by the Ministry of the Environment should be adopted in 2023 instead of 2025 (as scheduled for now). Life-cycle carbon emission controls should also be extended to renovations of existing buildings.

7) Granting tax deductions for energy efficiency investments to housing companies

Tax deductions will be granted for members of housing companies for energy efficiency investments carried out on the housing company, for instance a tax credit that is currently granted 2400 EUR a year per household for domestic help or household renovations (Verohallinto, 2017).

8) Funding for energy efficiency measures are provided by the public sector for housing companies and single-family house owners

Energy efficiency grants for members of housing companies and owners of single-family houses are re-introduced by the state. New funding solutions including green bonds are provided by municipalities. Funding is needed especially for the housing companies that can not obtain a bank loan for energy efficiency renovations (only for the basic and most urgent renovations) due to the poor state and low value of their property. Banks investigate the possibility of granting more favourable mortgage terms to energy efficient and/or low-emission house construction projects.

9) Centralized information services, training and support for promoting energy efficiency through public procurement is provided

There will be an increased need for smart public procurement as the health and social care reform will be implemented during the next regime and a significant amount of health care facilities will be demanded.

10) Taxation of heating oil for single-family homes will be increased

Significantly higher taxation will enable quicker phase out of oil boilers.

Method

Political recommendations outlined in this paper are based on the work of Murrosareena (author's translation: 'rupture space') group of 23 Finnish energy experts and visionaries. Using a transition management methodology, the group created eight pathways that enable a transition to a carbon neutral society by 2050 (Smart Energy Transition, 2017b). One of these pathways to reach the 2050 carbon neutrality target is: Halve the net energy consumption of buildings by 2030. The group determined up to thirty recommendations – many with a qualitative indicator – to the current government, municipalities, Motiva, energy companies, housing companies, construction companies, Energy Authority, The Finnish Innovation Fund Sitra, Ministry of the Environment, NGOs, institutional investors, large property investors, the Finnish Environment Institute, media, owners of single-family houses and their interest organisations that enable achieve the national 2050 target (Smart Energy Transition, 2017a).

Murrosareena was an 8-month joint project in 2017 by the Smart Energy Transition project and the Carbon neutral circular economy programme of Sitra, the Finnish Innovation Fund, a public foundation that operates under the supervision of the Finnish parliament. Smart Energy Transition research project is funded by the Strategic Research Council at the Academy of Finland (Smart Energy Transition, 2017b) that provides funding to long-term research aimed at finding solutions to the major challenges facing Finnish society (Academy of Finland, 2014).

For this policy paper the author interviewed several energy and real estate experts to choose the most effective (of the 30 created by Murrosareena experts) and relevant policy recommendations to the Finnish Parliament (i.e. which the parliament can implement). Interviews were conducted face-to-face or on the phone in October 2018. The respondents included representatives from Motiva, The Finnish Real Estate Federation, environmental services of Lappeenranta region, Kuusio Solutions consulting (energy efficiency and circular economy), Bionova consulting (carbon footprint calculations and tools) and Fourdeg service company (smart heating) (please see contact a list of these organisations in the end of the paper).

Also 3 energy efficiency experts from the Ministry of Environment were interviewed during the "Rakennetun ympäristön energiakysymykset -neuvottelupäivät held in the premises of the Ministry in Helsinki on 28-29.11.2018.

Background information on Finland's building stock

In 2014 the total value of office building stock was estimated to 20 billion euros. 72% of this was owned by professional investors, 15% by the public sector and 13% by households and small-scale investors. The Senate Properties manages most of the real estate assets owned by the Republic of Finland while municipalities also own a smaller share of offices in public ownership. Public sector actors don't own many commercial buildings. In Finland people have traditionally preferred to own their apartment rather than to rent one. Of the total of 2 580 000 apartments in Finland, 67% are owned by the people living in them. In addition, there are ca

820 000 rental apartments and 40 000 right-of-occupancy dwellings (asumisoikeusasunto) where a tenant pays a right-of-occupancy payment (ca 15% of the price of the apartment) in advance and a certain monthly charge. Most of the rental apartments (52%) are non-subsidized by the state and built without a loan or interest subsidy from the state. Most of the non-subsidized rental apartments are owned by households (62%), 31% by large private investors and 5% by institutional investors. There are 394 000 government subsidized and regulated apartments in total. 22% of the total apartment stock or 550 000 apartments (including non-subsidized and government subsidized) are owned by professional actors (KTI & Rakli, 2014).

Clarifications and background information to the 10 policy recommendations

3) A state company Motiva encourages public sector actors, companies, municipalities and consumers to use energy and materials in an efficient and sustainable way by providing information and various services coordinates information services on energy to consumers in Finland. Information on energy efficiency measures directly to consumers is also provided by several municipalities and usually funded with project funding from the EU, municipal energy companies or municipalities themselves. Information services are currently insufficient, not provided by all municipalities, scattered and funding is project-based, ie. unsteady. Members of housing companies and single-house owners are not particularly concerned about climate change but are motivated by potential cost savings to carry out energy efficiency measures. They need clear, concrete information on energy efficiency solutions, systematic property management and funding options from a reliable public sector source like municipality or Motiva in Finnish, Swedish and the largest minority languages. The information must be diversified to meet the needs of different segments of the large target group. There is a need for positive examples of successful renovations as media has in recent years been dominated by stories of failures e.g. mold in buildings and unhealthy indoor air.

4) There has been a lack of competent experts in HVAC (heating, ventilation, air conditioning) and geotechnical and structure design, as well as in different sectors of production. University students graduating from design, contracting, industry and maintenance do not satisfy even the current need – not to mention the increasing demand stimulated by these necessary proposals proposed in this paper. More professionals must be trained at universities in these fields (VM, 2016).

5) Threshold values for energy consumption of various building types were revised in 2017-18. The revised values are unfortunately too low to enable Finland meet its national target for carbon neutrality by 2050. The threshold values are unlikely to be revised during the next regime. The only way to toughen up the emission controls for existing buildings is to make the so-called energy form factors (energiamuotokerroin) emission-based. Energy form factors that are derived from primary energy factors have been used also in Finland as a basis of energy efficiency requirements and grading scale of energy certificates of buildings since 2012. However, these factors are not based on emissions of various types of energy but are politically determined. The recently revised factors came into effect in January 2018 (the old value is presented in brackets):

- electricity 1,20 (1,70)
- district heating 0,50 (0,70)
- district cooling 0,28 (0,40)
- fossil fuels 1,00 (1,00)
- renewable energy used in buildings 0,50 (0,50) (YM, 2017b).

Civil servants at the Ministry of Environment are currently discussing the option of introducing emission-based thresholds to energy factors.

6) Ministry's roadmap for reducing the life-cycle carbon footprint of new buildings

Ministry of the Environment is currently preparing a roadmap that will guide the life-cycle carbon footprint of new buildings through legislation by 2025.

- The Ministry has commissioned a study on the road map from a Bionova consultancy, which will proceed to an advisory round in November 2018.
- According to Bionova's study, the state regulation would primarily focus on energy regulations of new buildings and extend to emissions of building materials.
- Currently, a large share of the carbon footprint of a building is generated while the building is used. However, as emissions caused by energy production constantly decline, thanks to a shift to renewable energy, and energy efficiency improves, building materials will soon account for a more significant share of total life-cycle emissions.
- Life-cycle emissions of a building are currently not regulated in Finland and controlled primarily with voluntary commercial assessment tools for build environments including the British BREEAM and Life-Cycle instruments promoted by the Green Building Council of Finland.
- In Europe, legislation to reduce life-cycle emissions of buildings are already in use in France, the Netherlands and Belgium while Switzerland and Austria apply voluntary emissions-based control.
- According to Bionova's study, life-cycle emissions of a building would be determined using a standardized European calculation method. A shift to binding regulation and thresholds for building types would take place gradually through voluntary piloting, public procurement, reporting obligations and major building types (Bionova, 2017).

9) Already in 2016, demand for various public buildings was at the highest since 1995 although hospital project were expected to be delayed until the crucial decisions on the health and social care reform are made (VM, 2016).

List of the respondents' host organisations

- Motiva, <https://www.motiva.fi/en>
- The Finnish Real Estate Federation, <https://www.kiinteistoliitto.fi/en>
- Environmental services of Lappeenranta region
- Kuusio Solutions consulting, <https://www.kuusio.net/>
- Bionova consulting, <https://www.oneclicklca.com/about-bionova-ltd/>
- Fourdeg service company, <https://www.fourdeg.com/>
- Ministry of Environment <http://www.ym.fi/en-US>

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