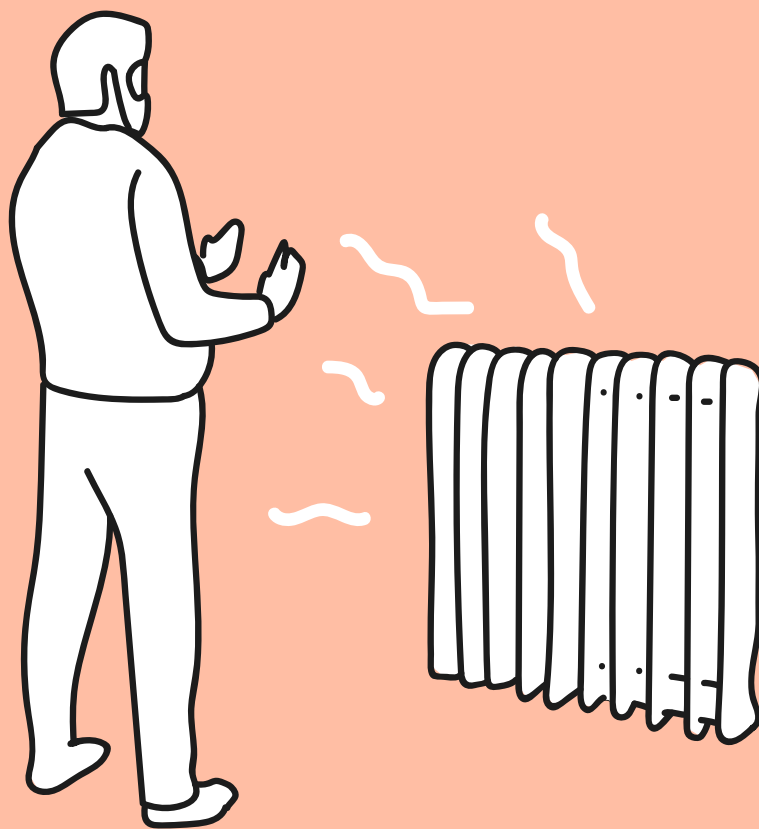


# License to Heat

**A JUST TRANSITION TO POST-OIL HEATING  
OF DETACHED HOUSES IN FINLAND**



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Design for Government / Aalto University 2020

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# Summary

As part of the Creative Sustainability program at Aalto University, Design for Government (DfG) course is an advanced studio course which promotes understanding of design-driven approaches to the complex challenges of the public sector. This year two different briefs were commissioned by ministries : A just transition to post-oil heating commissioned by the Ministry of Environment and the Orsi research project, and Boosting climate education commissioned by the Ministry of Environment, Ministry of Education and Culture, Finnish National Agency for Education, ORSI research project.

Our team worked on the just transition to post-oil heating project for 12 weeks from mid-February to the end of May. We went through the course design process, starting with a research phase, identifying the different needs of the stakeholders involved and mapping the systems to gain a deeper insight into the problem context, and then finding solutions, from a user perspective, with behavioural concerns. All along the process, the search for fairness drove our choices.

The key findings of our research were that reducing oil heating is not enough, user motivations are not tied to their climate views, the financial support for the transition doesn't cover everyone, users don't receive trustworthy official information, and that oil heating is not an active choice but the passive default.

We propose an oil heating license as an intervention to disrupt the default and make people active in their choice of heating method. And to create a point of communication for gathering information about users of oil heating, and to communicate to them about the transition. The license is made gradually stricter, to make those who need less support to transition first. This enables the government to focus on supporting those who need it most, in a way that is both fair and resource efficient.

# Our team



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# **Intro**

Finland's government has an ambitious goal to become carbon neutral by 2035. Due to the cold climate, heating consumes large amounts of energy. Oil is used to heat around 130 000 single family homes in Finland, and transitioning them to other heating methods has significant potential of emissions reductions. However, the government doesn't have up to date information of the houses or their residents. The transition also needs to be just. The project aims to find what hinders the transition, more effective measures, and how the government can support the transition.

Due to the situation of the COVID-19 pandemic, most of the project after the initial workshop had to be carried out remotely. We used digital collaboration tools to meet each other and our stakeholders, to share and analyse our findings, and to create our final proposal. We worked as a supergroup of 12 people working on the same brief sharing resources and doing research together, and as smaller groups of four students to develop three different proposals. In addition to this report, we recommend that you read the two other reports Energy Hero and Energy Ambassador as they include supporting information.

Our main interest was in emissions reductions and fairness of the transition, and our research and design process was guided by our design drivers:

## **Carbon neutrality by 2035**

Awareness of all the environmental consequences of the project, especially the urgent need of emissions reductions.

## **Fairness**

Ensuring equity and justice in the process and the solutions, being fair especially to people with low incomes.

## **Inclusiveness**

Everyone must be considered. Taking into account accessibility and the elderly.

## **Different needs**

Personalised approach, based on the different needs and possibilities of different people.

## **Empowerment**

People are learning from what we propose, they can make decisions, and the transition makes their lives better.

## **Transparency**

From the institutions, for the whole transition process. Giving people reliable information.

# Methods

## Workshop

We started the project by hosting a stakeholder workshop as the supergroup. The participants were an ORSI researcher, representatives of the Climate Unit of the Ministry of Environment, and some representatives of the supergroup. During the workshop, the participants explored the current situation, visions of the transition, and possible barriers the government and the residents might face. The workshop was divided into three parts: icebreaker, vision & expectation and mapping. The workshop provided useful information, and a starting point for further research.



PHOTO BY SHREYA SOOD

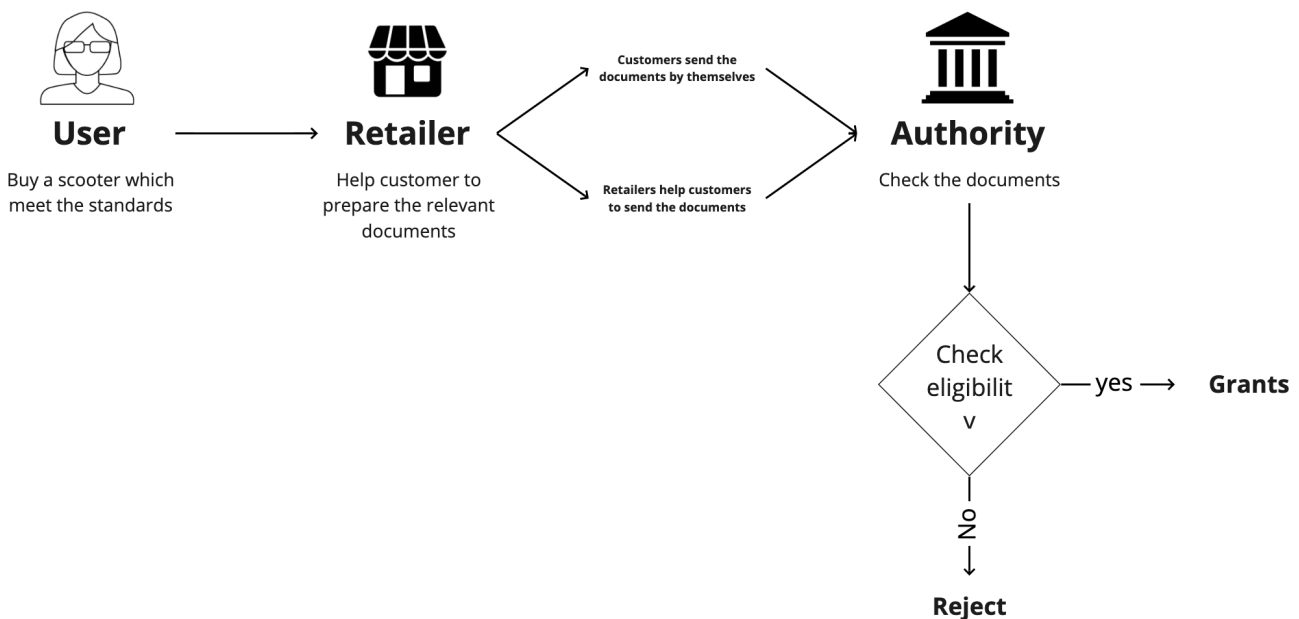
## Desktop research

To understand the situation, we sought information of different types and different fields. We first needed to learn more about Finnish incomes, home sizes and heating methods, that we found on Statistics Finland (2018abcd, 2019).

To learn more about what a just transition means, we read the papers What is the 'Just Transition'? (Heffron & McCauley 2017) and Just Transition: Integrating climate, energy and environmental justice (Heffron & McCauley 2018).

We looked into the methods of other countries, how Sweden, Taiwan and Norway are operating the energy transition (Dzebo & Nykvist 2017, Carrington 2019). Taiwan, as an example, inspired us for the support system. It is a narrow island which relies on oil-scooters as the main traveling tool. In 2018, the government made a law that encourages the general public to replace their oil-scooter by an electric one, providing subsidies for the transition. Based on a principle of licensing, the support is designed according to the size of the scooter and the income of the owner. (Industrial Technology Research Institute.)

PROCESS OF TAIWAN SCOOTER TRANSITION



The paper Household energy use: Applying behavioural economics to understand consumer decision-making and behaviour (Frederiks, Stenner & Hobman 2014) was vital in understanding behavioural insights in the context of household energy use, and What is needed to phase out residential oil heating in Finnish single-family houses? (Hasta, Ekholm & Syri 2015) provided scenarios of the transition in the Finnish context.

We also read various Finnish news articles related to oil heating and energy renovations (Miettinen 2019, TM Rakennusmailma 2019, Sarkiola 2016, Seeskorpi 2018, Östman 2019).



## **Interviews**

We interviewed several different stakeholders to see the situation from the human perspective, but also to gain more knowledge of the situation. Due to the pandemic, all of the interviews were carried out remotely.

### **Omakotiliitto**

With the supergroup we interviewed a representative of Omakotiliitto, an organisation for owners of detached houses. They helped us understand the situation and defended the rights of the residents and voiced possible problems with the transition. Through them we were able to do the questionnaire to their members.

### **Lämmitysenergia yhdistys**

Also with the supergroup we interviewed two representatives of Lämmitysenergia yhdistys, an organisation mainly for oil heating companies, that gave us their point of view.

### **Mikko Jalas**

Jalas is a researcher at ORSI and Professor of Sustainable consumption at Aalto. In the ORSI project he aims to produce research knowledge and practical mechanisms that will help public authorities to effectively steer and facilitate a systemic change toward the eco-welfare state. He helped us understand the energy consumption background in Finland and alternative options in the transition. He also pointed out practical problems with the transition that have to be considered from the user and technical perspectives.

### **Kela**

We interviewed a service designer from Kela to find out if they offered or could offer any support for the transition. We found out that currently Kela doesn't provide any support for housing renovations, as they just ensure that the basic needs of citizens are met. Kela could offer support for renovations, but this would require changes to the law and strong political will. They also acknowledged that people may not be aware of the support they can get, and that the administrative process can be very difficult.

### **ARA**

We interviewed a representative of ARA to learn about the support they offer for energy related renovations. For energy renovations ARA is providing two main types of subsidies. One is for households that plan to do energy renovations, with an eligibility based on energy savings, and no income limits. The other one is mainly for low income elderly who require renovations to keep their home livable, and it has no sustainability requirements. This support system benefits more middle-income people that can afford the transition helped by the first support. The support is too weak for many low-income people that have no other choice but to continue oil heating.





## **Users**

We interviewed 12 current and ex-users of oil heating: eight people in facebook chat, seven of them current users of oil heating and one ex-user, and two people via email, one current and one ex-user of oil heating. We also interviewed one current user of oil heating in a video call, and received pictures of their heating system, and answers to questions via email. With the supergroup we had a house and boiler tour via video call with another user of oil heating. Possibly due to reaching most residents through Facebook, the residents were mostly younger than most users of oil heating, but both of our video calls were with residents over 60 years old.

With our user interviews we were able to better understand and empathise with the point of view of the residents. And by focusing on individuals we found information that was supported by the questionnaire data, but in unexpected combinations on the individual level.

## **Questionnaire**

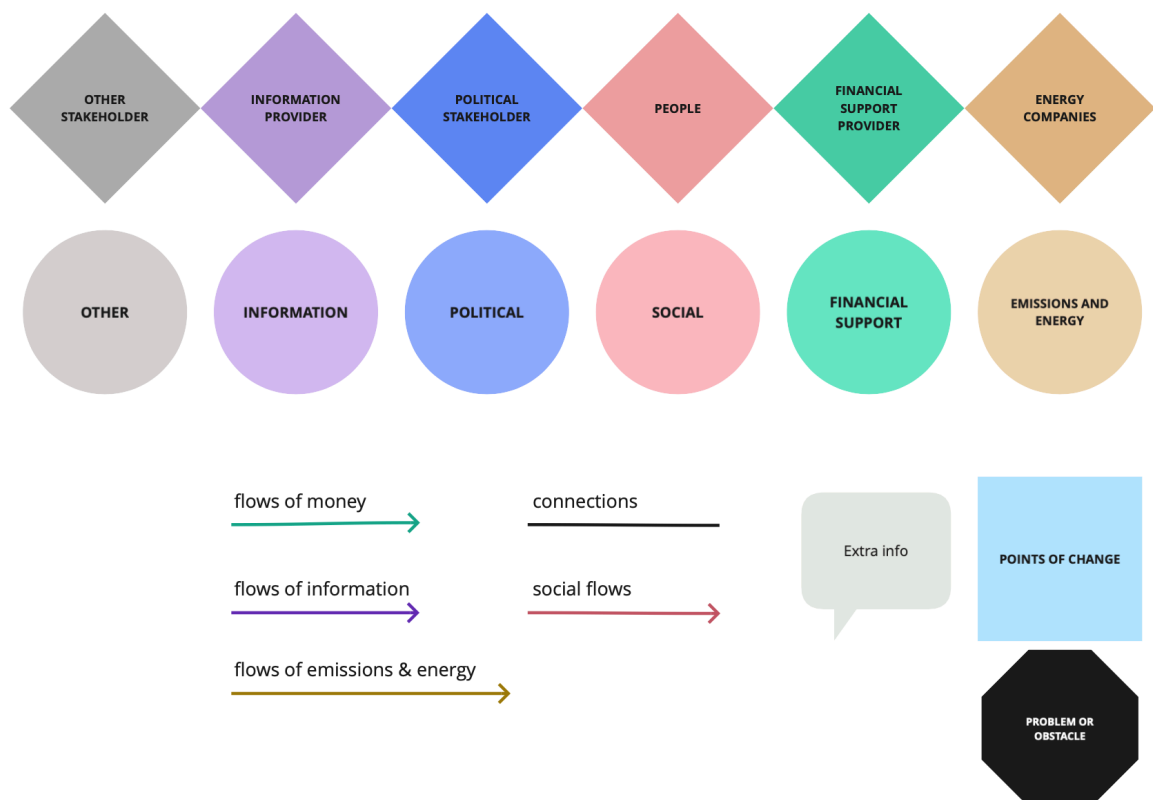
The supergroup did a questionnaire to 3774 residents of detached houses through Omakotiliitto. Of the residents 959 were current users of oil heating, 763 ex-users, and 2052 non-users. Full results of the questionnaire are in the final report of another group titled Energy Hero.

## Systems maps

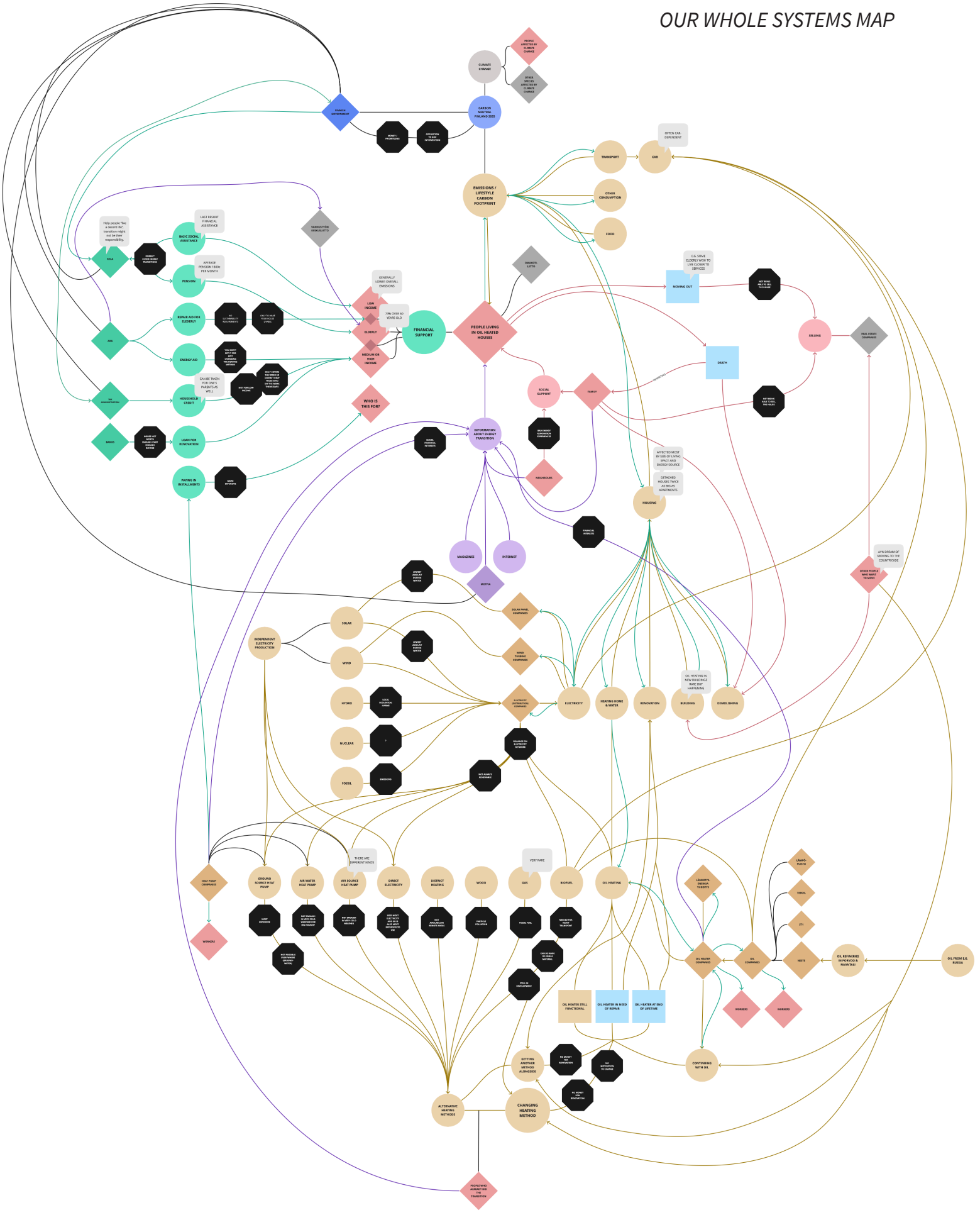
Our most important tool for analysing our findings was our systems map, where we mapped the current situation, stakeholders, connections, flows, and problems. We also included points of change (when people change their heating method), and small notes of relevant information. Our map centered on the people living in oil heated houses, and included the financial support for the transition linked to level of income, sources of lifestyle emissions not limited to but with a focus on housing, oil companies, different heating methods and electricity sources, sources of information about the transition, and what happens when the owner of the house dies or moves out, or when the oil heater breaks.

Mapping the current system allowed us to identify four categories of flows : emissions, money, people and information; and to follow them along the different stakeholders and situations. It highlighted the complexity of the relations operating within the system, and where the government is situated, and where it is not present as well. This work helped us to imagine how the government can work on these flows, to orchestrate the transition.

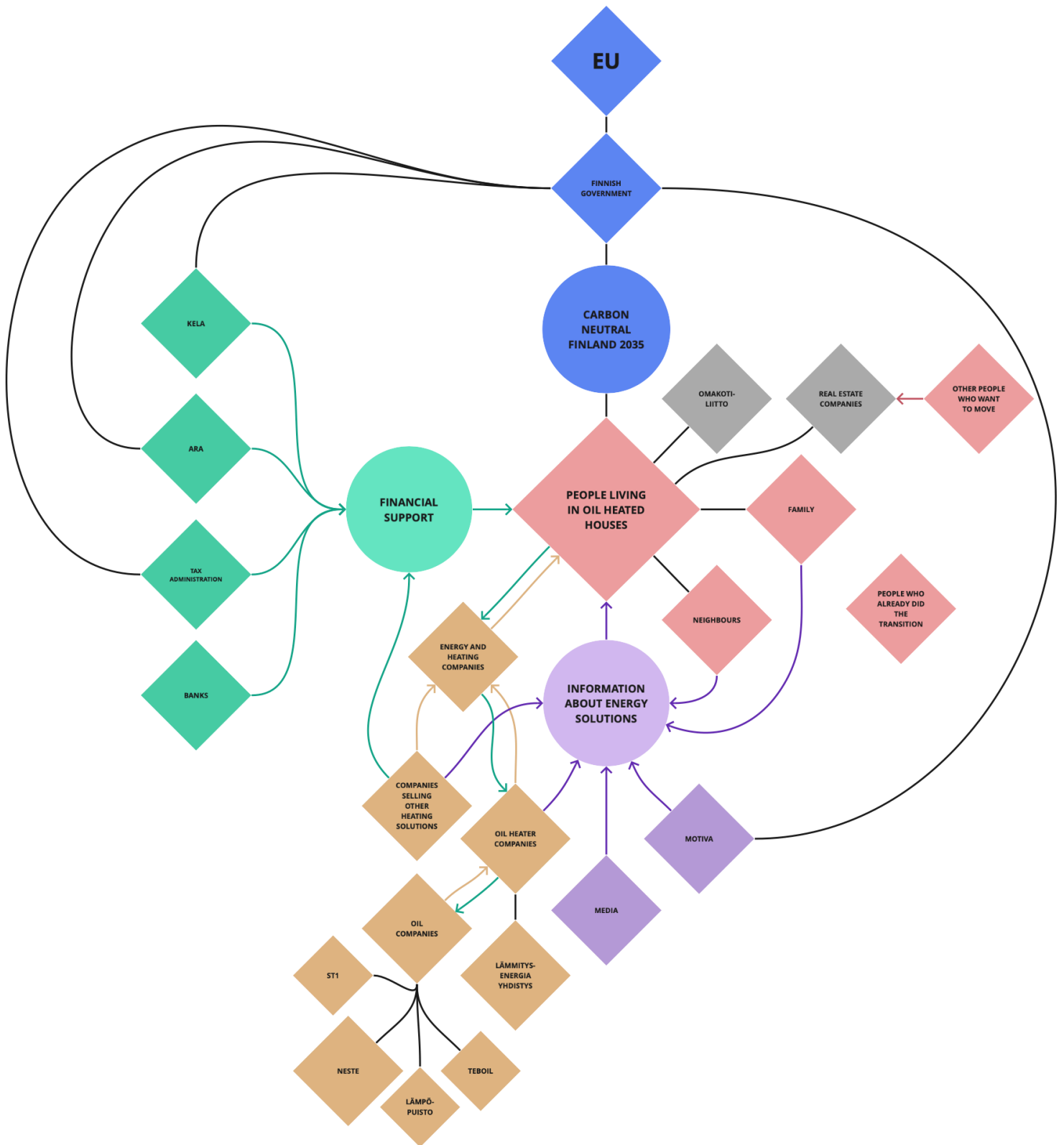
As our big systems map is too big to present, we created a much simplified version for presenting some of the most important stakeholders and flows.



# OUR WHOLE SYSTEMS MAP

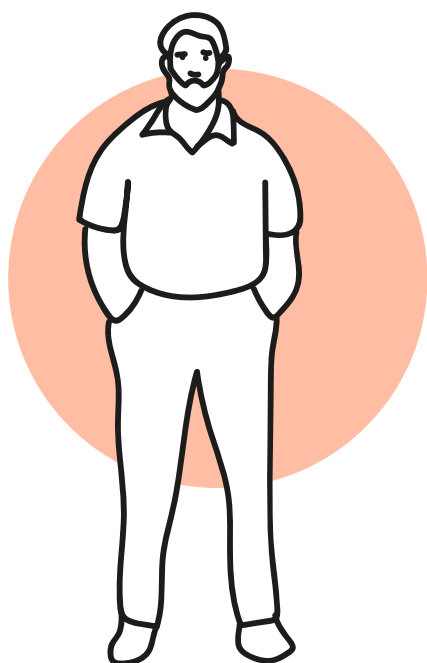


SIMPLER STAKEHOLDER MAP



## Personas & timeline

Out of the residents we interviewed, we chose three households that represented different views and situations. We modified them very slightly and used them as personas to imagine how our proposal would work for them. We backcasted the future by starting with Finland having transitioned away from oil heating by 2030, and wrote the user journeys in the form of a story. The timeline of the transition is described in detail starting from page 20.



### **MAKE, 44**

- unemployed
- single father of 2 children
- 110 m<sup>2</sup> house
- against climate goals
- not willing to get rid of oil heating, because can't afford to



### **LIISA, 68**

- pensioner
- lives alone
- 140 m<sup>2</sup> house
- feels positive towards climate goals
- has reduced oil usage
- not planning to get rid of oil heating, because is content



### **PANU, 34 & JENNA, 35**

- both work
- 2 children
- 220 m<sup>2</sup> house
- against climate goals
- planning to get rid of oil heating, but waiting for government intervention

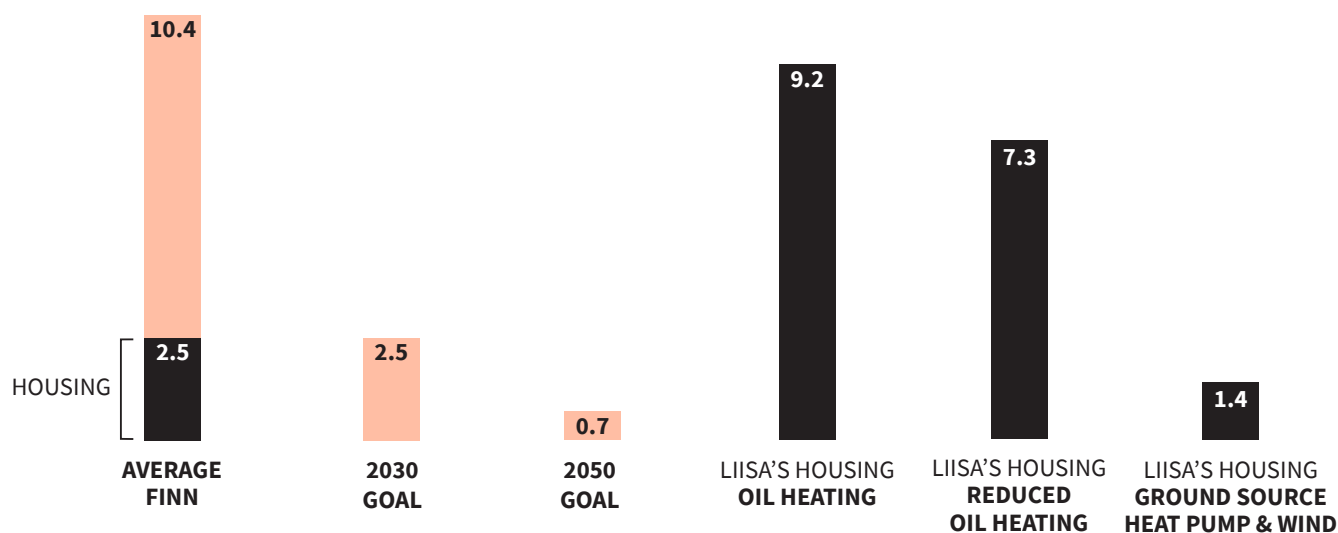
# Key findings

## Reducing oil usage is not enough

The lifestyle carbon footprint goals for staying below 1,5 degrees global warming for 2030 and 2050 demand enormous reductions in emissions for Finnish people (Lettenmeier et al. 2019). Users of oil heating have larger housing emissions than average due to the high carbon intensity of oil, but also due to larger living space per person. Detached houses are much larger than apartments on average (Statistics Finland 2018a), and users of oil heating often live in households of 1 or 2 people. As the users are quite old on average, many of them have had their children move out years ago and some are living alone after a divorce or death of their spouse. But there are different households and some are also young single people living in big detached houses, and some are larger families. People living in detached houses are also often car dependent, which causes higher transport emissions.

We made example calculations based on one user we interviewed using the Syke climate diet calculator. Her housing emissions used to be almost as much as the whole average carbon footprint of an average Finnish person. But she had reduced her oil usage by getting an air source heat pump, decreasing the inside temperature, and heating only a part of her house. She had also done other changes to her lifestyle to reduce her emissions, for example driving less. However, even with these significant housing related changes and emissions reductions, her housing emissions are still many times the current average. It is difficult to see reaching the climate goals without completely replacing fossil fuels with renewables.

CARBON FOOTPRINT / TONS OF CO<sup>2</sup> E / YEAR / PERSON  
SOURCE: M. LETTENMEIER ET AL. (2019) 1.5-DEGREE LIFESTYLES  
& SYKE'S CLIMATE DIET CALCULATOR



**“The whole goal is just about bullying and controlling the common people. Increasing taxes will clean the air, yeah right.”**

*CURRENT USER OF OIL HEATING, 44*

## **User motivations are not tied to climate views**

Users of oil heating don't have strong value based reasons to heat with oil. This finding was supported by both expert and user interviews and the questionnaire. We interviewed several users who felt like the climate goals are unfair to them and called them bullying, while some others felt positive towards the goals and supported them, having done changes to their lifestyles to reduce their emissions.

What was interesting was that unlike we assumed, negative views towards the climate goals were not a reason to continue heating with oil, and while positive views towards the climate goals were a motivator for getting rid of oil heating for some, others were not motivated to get rid of oil heating despite their positive views towards the climate goals. There was no value based opposition for the transition even from those who are against other changes to reduce emissions.

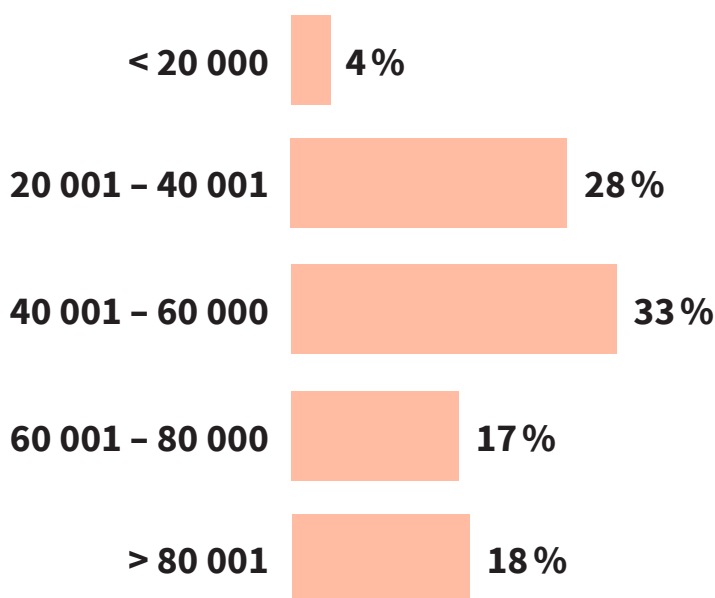


## Financial support doesn't cover everyone

The only strong reason we found in our research for not getting rid of oil heating, was not affording to. And in our interviews with ARA and Kela we found out that there isn't financial support for everyone to be able to afford to get rid of oil heating.

It's those with lowest incomes that have the least options and are the least covered by the financial support to transition away from oil heating. But as the renovations are quite expensive, it's not only those below the poverty line that need financial support. But according to our questionnaire most users of oil heating are middle class, so many of them could change their heating method without any big changes to the current financial support system.

*ANNUAL INCOMES OF HOUSEHOLDS WITH OIL HEATING*



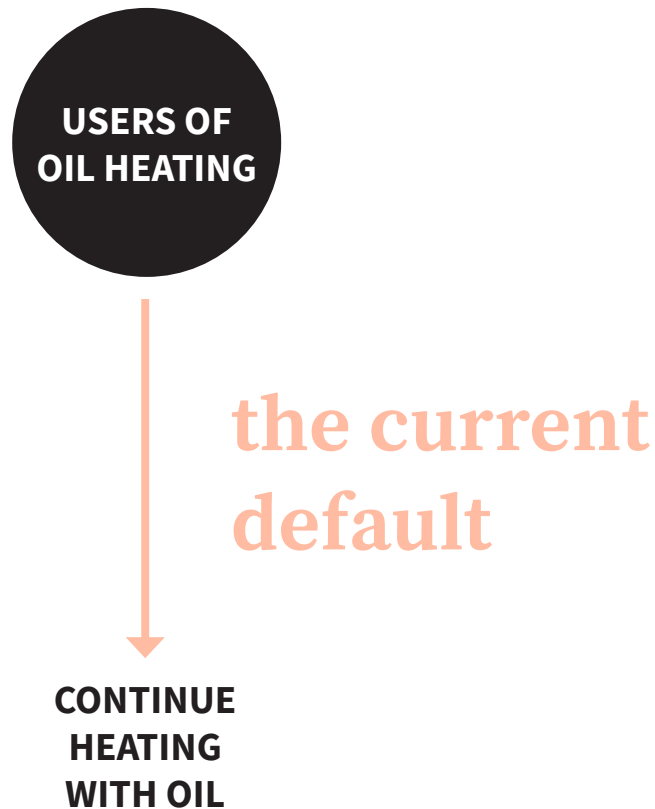
## **Users don't receive trustworthy information**

With our systems map we found flows of emissions corresponding to flows of money and information between users and companies. And in our interviews we found out that people have very varied amounts of knowledge about energy systems, and they get their information from different sources. Family can be an important source of information for some, but people also get a lot of information about energy solutions from the companies selling them. They feel that it is marketing and motivated by money, not the best interest of the individual. We ourselves questioned the reliability of the information they provide too, when we received an email from an oil heating company saying that oil heating is ecological. We also read and heard about aggressive marketing, and even scams (Sarkiola 2016, Seeskorpi 2018, Östman 2019).

Perceived trust refers to people trusting information more if it's from a source they perceive as credible and trustworthy. In the case of energy, people tend to perceive official sources as more trustworthy than companies trying to sell them something. (Fredriks et al. 2014.) However, communication from the government doesn't reach most people. Out of the people we interviewed many had never heard of ARA or Motiva, and were not aware of any subsidies they could get, most knowing only about the household credits tax reductions.

**“They almost tried to force me to buy a new heat pump, I felt quite annoyed.”**

*CURRENT USER OF OIL HEATING, 68*

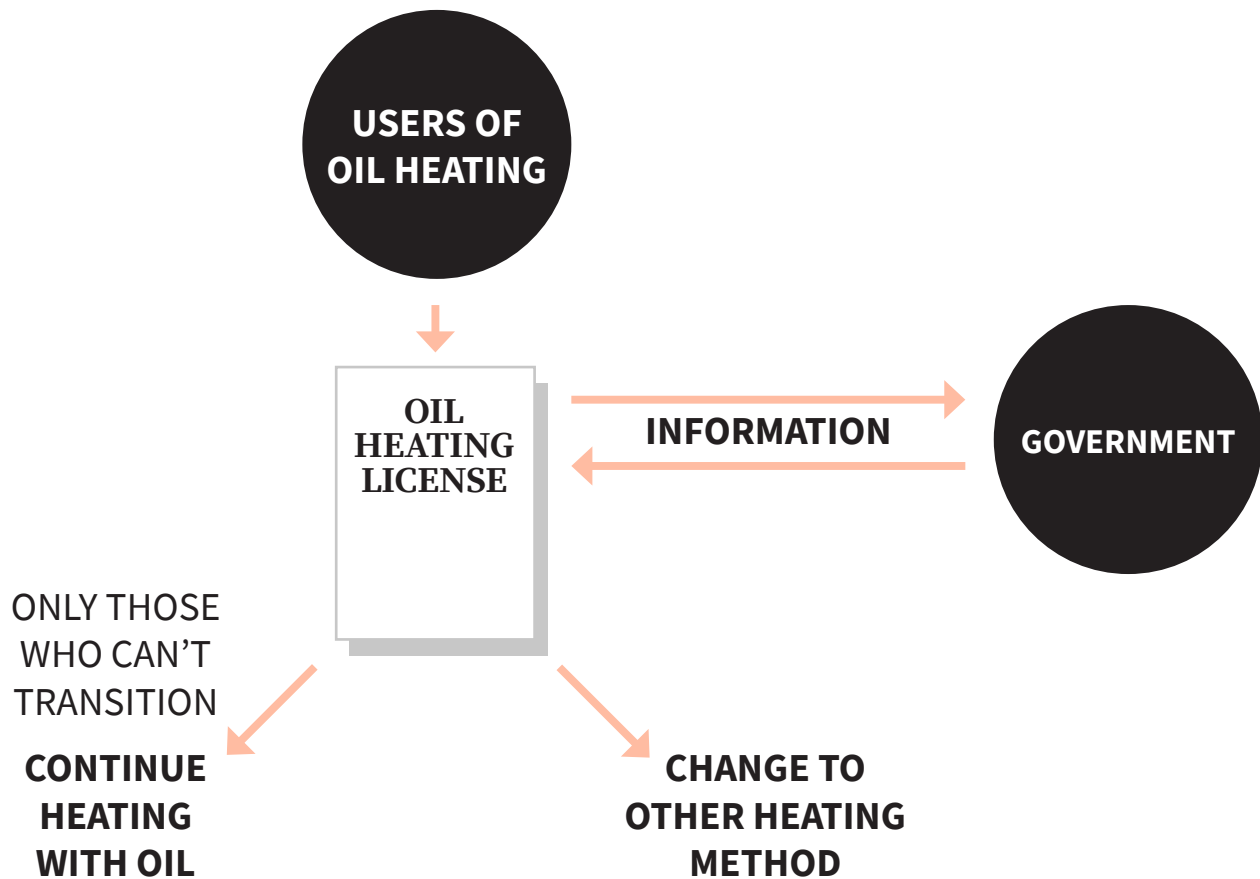


## Oil heating is the passive default

Status quo bias and defaults are terms used in behavioural economics to refer to people preferring things the way they are, things presented first, and the easiest options that require the least effort. Oil heating is the default for its users, and it benefits from the status quo bias. Users have oil heating because it came with the house, or because it was the best, or even only, option when they got it many decades ago. This is supported by both the expert and resident interviews, and the questionnaire. Changing the heating method would require active effort, but continuing to heat with oil is the passive default.

In addition to the status quo bias, oil heating is also related to other behavioural insights, such as the sunk cost effect (people preferring to stick with something they have paid for) and temporal discounting (undervaluing long term benefits). These mechanisms are working against the transition. (Fredriks et al. 2014.)

# Intervention: the oil heating license



## Creating a trigger point

As described in the previous section, continuing to use oil heating is the passive default that people don't actively choose, and they don't have value based reasons to heat with oil.

Our solution is an intervention that disrupts the default and changes the dynamic: the oil heating license. To continue using oil heating, you will need to apply for a license. The license is at first granted to everyone who applies for it, for a limited amount of time. But having to apply for it would force people to think about their heating method.

Our proposal is to create a trigger point for action. Under our license system for oil heating, people have to take active action, either to justify their need to continue heating with oil, or change their method of heating. Taking no action is not an option with this intervention. The license would be required to be able to buy heating oil.

## **Gathering information from users**

The intervention also creates a point of contact that reaches all users of oil heating, enabling gathering information about the users and their situations. This creates a registry of all houses with oil heating and their residents. The information gathered is then used to modify the plan and to be able to offer better support for those who need it, to be able to meet the needs of individuals.

## **Providing information to users**

This point of contact is also used to communicate reliable information about emissions, renewable energy, the transition, alternative heating methods and financial support to the users of oil heating. The information is from an official source, answering to the problem we found, that a lot of the information the users get at the moment is marketing from companies. The information is communicated as part of communicating about the license in the media and in campaign materials. Users are also led to information provided by Motiva, and some information is in the application form itself, for example as a question about which financial support one has applied for.

## **Limiting who gets the license**

The requirements to get the license are made stricter gradually, so that only those who can't change to a better heating method, are allowed to continue heating with oil. But for everyone to be able to transition away from oil heating, there needs to be better support. Our approach is to first get the people who can feasibly transition to new heating methods without new financial support to do it. Then there will be more time to understand and meet the needs of those who need more support. When the only people who remain are those who can't transition without support, fewer resources will be required to provide the support needed.

## **Supporting those who need it**

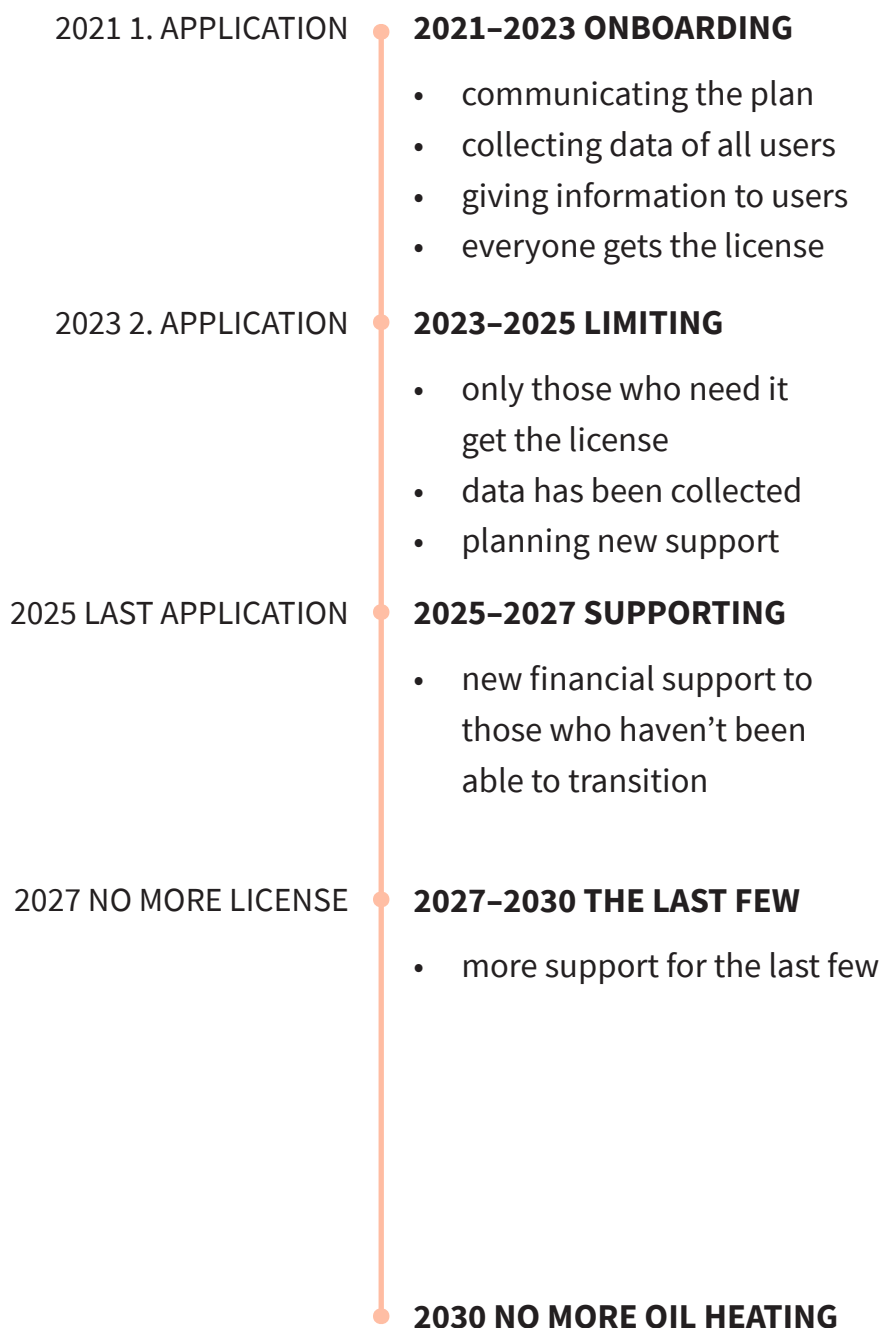
To support those with lower incomes, there needs to be a new subsidy for getting rid of oil heating. It would be designed based on the information gathered with the license applications. The new subsidy would be applied for through Kela, so that it's easier for people who already receive some benefits. The amount of subsidy would be based on the size of the family, their income, and the house, as well as the location.

The current support could be improved by linking existing subsidies to emissions. In ARA's renovation subsidy for elderly, there should be sustainability requirements, as there currently aren't any, so that when renovating heating systems, lower emission alternatives would be preferred. Also the household credit tax reduction could be increased for renovations that reduce housing emission.

# Timeline of the transition

We planned the transition by backcasting it from the goal of getting rid of oil heating by 2030, and planned the transition of three example households based on residents we interviewed. We divided the transition into 4 phases: onboarding, limiting, supporting, and the last few.

The time to do the transition is based on capability and need. First those for whom the transition is easy are nudged to do it. Then only those who can't do it are allowed to continue heating with oil, and then are supported to change their heating method.



## 2021–2023 Onboarding

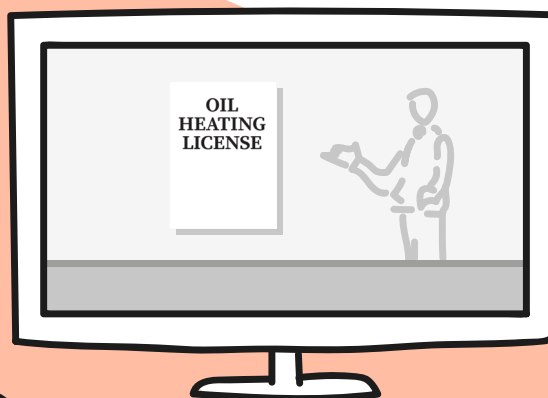
A representative of the ministry of Environment present in the TV news the new heating license along with other changes related to the transition toward carbon neutrality.

Thanks to several media, most users of oil heating became aware of this licence. Also the companies providing heating oil are required to tell their customers of the license being needed in the future to buy their product.

Users of oil heating learn that they have to apply for the license by the end of the year, with a paper form, or online on a dedicated website, with the applications going through Lupapiste. While filling the application, they get not only information about the license and its purpose and about the income limit to use further oil, but also on other ways of heating with technical advice. They are also led to find further information on energy savings and reducing housing emissions.

With this information users know what they should do. Those who need to continue using oil heating will continue to do so, but may do other changes such as changing to renewable electricity. Those who know they will have to change their heating method soon and can do so without new support, can start planning their renovations.

Thanks to this registration, the government gains a complete database of oil heated houses and their residents.





## 2023–2025 Limiting

The requirements to get the license are made stricter, so that only those who can't do the transition get it. Users of oil heating apply again, and during this registration they get more specific and updated information about the new conditions to get the license, based on income level and possible other obstacles. It is clear to users whether they will get the licence or not. Those who apply but aren't eligible, will have three years to do the transition, and if they have some issue, they can request an adapted solution.

The information collected can be analysed automatically by a computer system to allocate the licenses.

## 2025–2027 Supporting

Those who can't do the transition continue heating their houses with oil. But with the information collected in previous applications, new support has been designed to target the needs of those users who are not able to do the transition without additional support. The new support is communicated to users, and they can apply through Kela.





### **2027–2030 The last few**

Only a few people still use oil heating. The government has all the space needed to hear their specific needs and allocate adapted financial, knowledge and technical support. They can for example receive help for planning the renovations and instructions on how to do the work themselves, in addition to financial support for buying the equipment.

### **2030 No more oil heating**

No more people are using oil to heat their houses. The licence service closes, but the data collected in the process is used to understand other housing related emissions in planning their further reductions.

# Conclusion

Our research led us to the conclusion that the urgency of the climate situation, and the necessity to address fairness in the transition processes, required the kind of strong policy that we propose.

We found out that there is currently no up to date information of the houses with oil heating or their residents, and the implementation of the oil heating license would enable gathering information about all of them and create a complete and up to date registry. It would also be a way to reach all of them, a task which can be otherwise difficult.

As users don't actively choose oil heating, for example just raising the tax of heating oil would feel like punishment to people just continuing to live their lives. And it would feel especially unfair to those who can't afford to get rid of oil heating, and for some, especially if combined with driving becoming more expensive, it could even force them to move out of their home. Letting only the wealthy to continue their lives and lifestyles is not just. The current situation is that some people are not able to transition away from oil heating, and thus they need to be allowed to continue heating their homes with oil until they are provided the support they need. This is a point that is vital to be communicated clearly. Our idea is getting the more capable to transition first, and then providing more support to those who need it. This is necessary to be both resource efficient and fair.

The focus of our proposal is on the intervention, and it could be complemented with the proposals of the other groups more focused on other aspects of the transition.

We wish our insights and ideas, even if not implemented as such, provide understanding and inspiration for the transition towards a carbon neutral Finland.

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