

Nordic Energy Efficiency Conference Oslo 2025

Experience with and lesson learned
about Energy Efficiency in the
Nordics

Roberta Moschetti
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Summary and key takeaways

Experience with and lesson learned about Energy Efficiency in the Nordics Roberta Moschetti, SINTEF.

Moschetti presented the SINTEF study on energy efficiency in buildings and industry sectors across six Nordic countries: Denmark, Faroe Islands, Finland, Iceland, Norway, and Sweden. The project has mapped:

- Objectives, targets, and strategies for energy efficiency.
- Policy instruments and exemplary initiatives.
- Key barriers to implementation.
- Transferability of best practices.

Moschetti emphasised the high consumption in the Nordics and the need for efficiency to meet climate goals. She further noted that all Nordic countries have energy efficiency targets to meet by 2030, e.g., phase out fossil fuels in heating and industry by 2035 (Iceland) and reduce oil consumption in industry and emissions from buildings by 43% by 2030 (Sweden).

The instruments for energy efficiency were summed up as regulatory instruments (building codes, mandatory energy audits), financial incentives (grants, subsidies, green financing, energy taxes), informational support (advisory services, energy labelling, awareness campaigns), and voluntary programs (environmental certifications, industry-led initiatives). Moschetti further commented on two of the 18 initiatives on energy savings within the project, framing them as exemplary. This was the “halv more” initiative from Sweden and the energy efficiency agreements for industries in Finland (presented more in depth by Kati Ruohomäki earlier in the day). The two initiatives reached grand savings, but Moschetti commented on some key barriers to the implementation of energy efficiency measures. These were summed up as:

- Technological and infrastructure constraints.
- Lack of alignment with national policy priorities.
- Challenges in monitoring and implementation.
- Industry-specific obstacles, including high upfront costs.
- Lack of initiative.

Moschetti concluded with some recommendations for future action. These included strategic alignment to unify the Nordic efforts, the need to transfer best practices, and the need to address the barriers to implementation.

Key takeaways:

- The Nordic region has ambitious targets in energy efficiency but still faces obstacles on multiple fronts.
- The Nordic countries need a strategic knowledge sharing of best practices.
- The barriers to implementation must be addressed with policy measures.



We must share knowledge from successful initiatives across borders. Each country is eager to learn from the others.

Roberta Moschetti,
SINTEF.

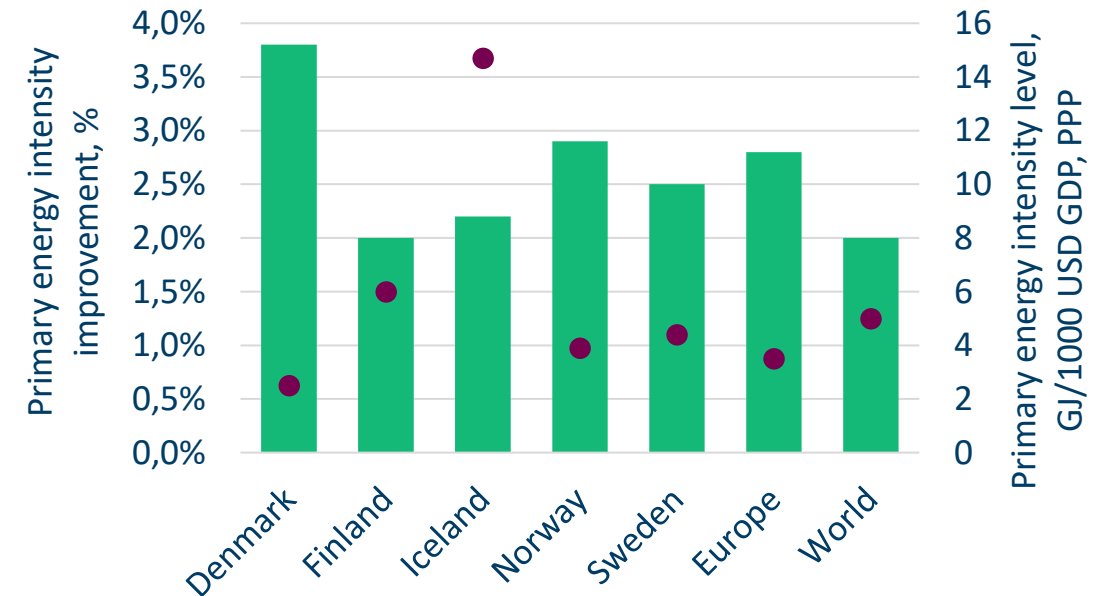


Agenda

- Background
- Project on energy efficiency in the Nordics
 - Mapping current objectives, targets, and strategies
 - Exploring current and past policy instruments
 - Selecting exemplary initiatives
 - Identifying of key barriers to Nordic energy efficiency
- Conclusions and perspectives

Background

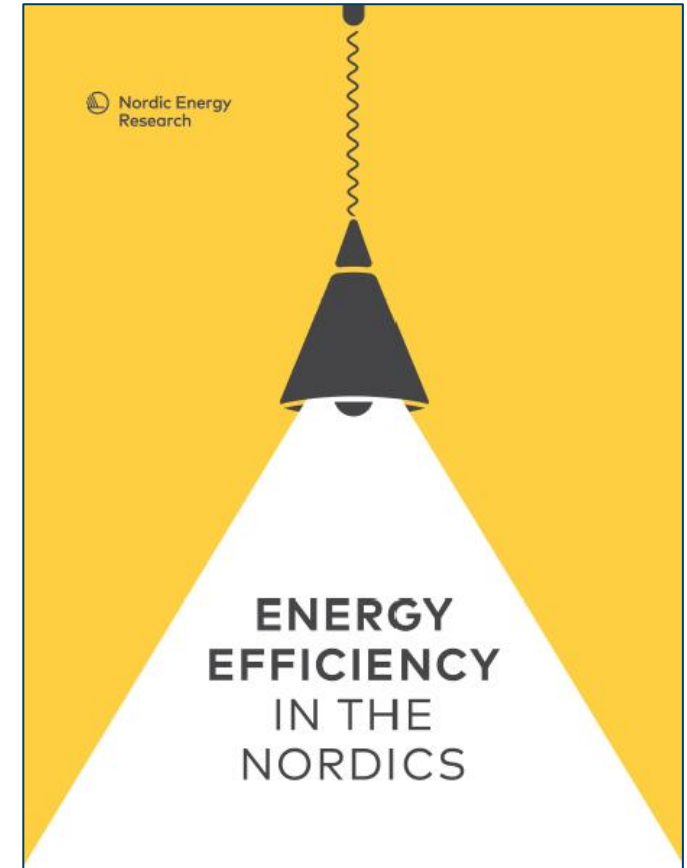
- World total **final energy consumption** in 2023: 445 EJ.
 - Industry: 39%
 - Buildings: 28%
 - Transport: 27%
- **Energy efficiency:** Key priority in EU ('Energy Efficiency First')
- **Nordic region:** High gross final energy consumption per capita (3.7 toe in 2019 compared to the EU's 2.3 toe)
- Nordic efforts to reduce **primary energy intensity**





The project

- **Duration:** November 2023-December 2024
- **Focus:** *Energy efficiency in building and industry sectors across: Denmark, Faroe Islands, Finland, Iceland, Norway, and Sweden*
- **Contract partner & Funding:** Nordic Energy Research and Nordic Council of Ministers
- **Project lead:** SINTEF Community
- **Steering group:** Representatives from national energy authorities
- **Project partners:** SINTEF Energy; IVL; Aarhus University; Tampere University; and Reykjavik University



TAMPERE UNIVERSITY OF TECHNOLOGY



HÁSKÓLINN Í REYKJAVÍK
REYKJAVIK UNIVERSITY



Information sources and methods

➤ Information and data

✓ Partner experts



✓ International Energy Agency (IEA) database

✓ Odyssee-Mure project

➤ Questionnaire for key market actors



Government Offices of Sweden

➤ Tour de Capital with steering group



➤ Online workshop with experts



Identifying central barriers for Nordic EE

Reducing energy consumption and energy waste across the energy system—from production to final consumption—in all economic sectors is one of the EU's strategic objectives.

Energy efficiency (EE) has also been included as an important focus area in the Nordic energy policy cooperation program. Today, the Nordsyn group, which was established by the Nordic Council of Ministers, collaborates in joint efforts to implement EU directives and regulations regarding ecodesign and energy labeling.

The goal of this ongoing project 'Comparative analysis and experience with energy efficiency in the Nordics' is to identify EE measures that have been implemented in Nordic countries and can be replicated in other Nordic countries as well as barriers that could hinder effective implementation. Furthermore, the study will investigate to what extent the projects or activities are aligned with the EE agenda in the Nordic countries and support the EU principle of energy efficiency first. More information on the project is provided here:

[Comparative analysis of and experience with energy efficiency in the Nordics – Nordic Energy Research](#)

The project includes a barrier analysis for the implementation of the EE measures. To that end, this survey has been developed.

You receive this survey because you have been pointed out as an expert in your field by at least one of the involved project partners.



Objectives and targets for energy efficiency

Examples in Cross-sectors / Buildings / Industry

Denmark

Reduce GHG emissions by 70% in 2030

Phase out oil and gas use in space heating by 2035

Achieve a green transition of industry

Faroe Islands

100% green electricity by 2030

Renewable energy heating in houses

Reduce oil consumption in industry

Finland

51% renewable energy share of the final energy consumption

Reduce the heating energy use of the building stock
Create competitive carbon-neutral industry by 2030

Iceland

Replace fossil fuels with renewables

Total transition to renewable sources in industry

43% total reduction in emissions from buildings by 2030

Norway

Low Emission Society by 2050

Reduce electricity use in buildings by 10 TWh by 2030

Phase out fossil fuels in industry

Sweden

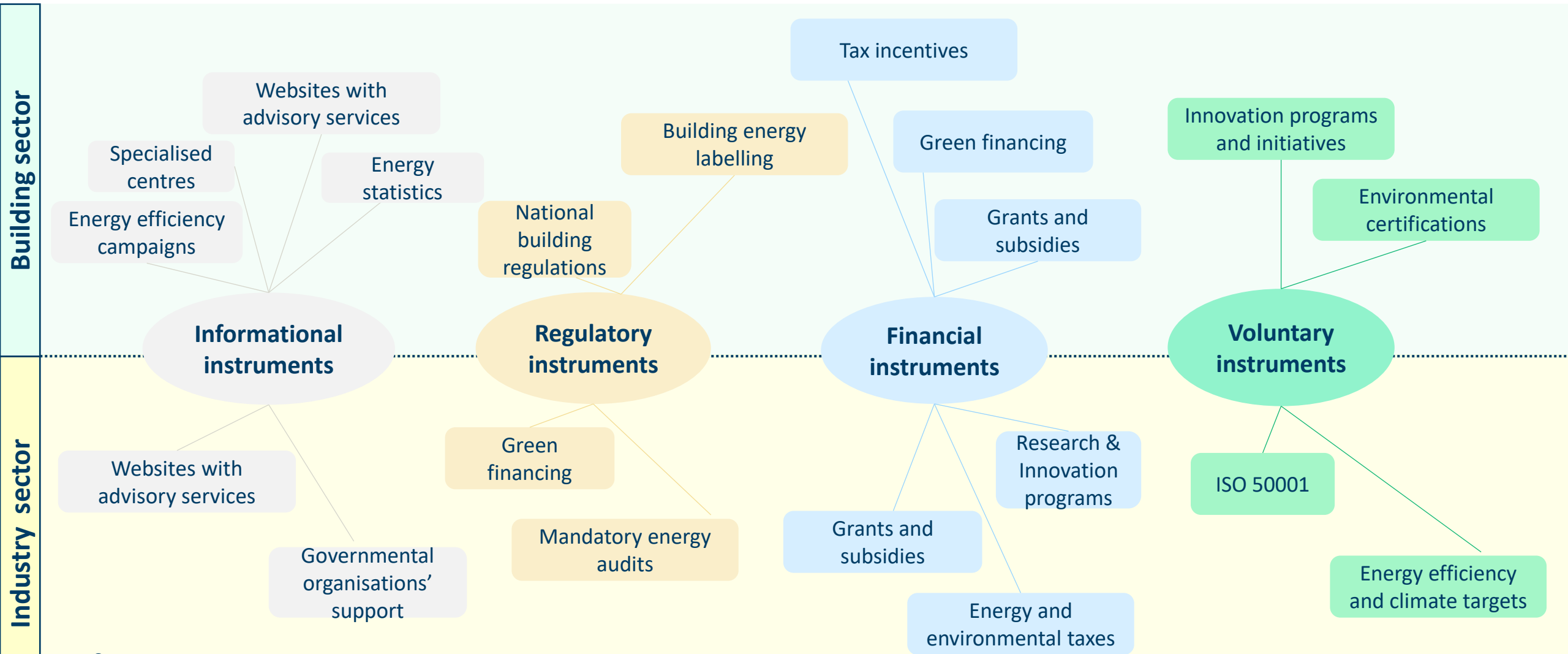
100% fossil-free electricity production by 2040.

Lower energy consumption of the building stock







Unlock the energy efficiency and flexibility potential in the industry sector



Policy instruments for energy efficiency



Assessment criteria of exemplary initiatives

	Energy saving impact	Actual or potential / cumulative or annual energy savings (GWh/year)
	Other effects	CO ₂ and cost savings / implementation in regulations / enhanced knowledge / market growth, etc.
	Cost effectiveness	Implementation costs / energy savings (€/GWh)
	Level of spread	Adoption / implementation / dissemination
	Obstacles	High upfront costs / technological complexity / limited expertise / resistance to change, etc.
	Success factors	Alignment with regulations / technical support / stakeholders collaboration / monitoring and report, etc



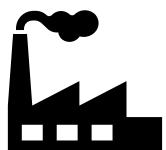
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Exemplary initiatives

Building sector



Industry sector



	Denmark	Finland	Iceland	Norway	Sweden
Building sector	Window energy labelling	Property and Building Sector Energy Efficiency Agreement and HÖYLÄ IV	Subsidy for heat pumps and geothermal district heating systems	Programme for passive houses and low-energy houses	Programme for buildings with very low energy use (LÅGAN)
	Minimum requirement targets for energy saving for new and existing buildings	Promotion of heat pumps		Programme for best available technology (BAT) in existing buildings	Halv More campaign (Halvera Mera)
Industry sector	The energy saving scheme for energy companies	Energy Efficiency Agreement for Industries	Incentives for industrial energy conversion projects through the Energy Fund	Programme for climate and energy initiatives for industry	Programme for energy efficiency in energy-intensive industry (PFE)
	Subsidy scheme for renewable energy use in production processes	Energy Audit Programme (EAP)		Support for the introduction of energy management	Energy efficiency networks for SMEs

18 assessed initiatives



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Some examples

Halv More campaign (Halvera Mera) - SWEDEN

2013–2017 (3 stages)

To support building owners to identify measures resulting in a halving of energy consumption in multi-family dwellings during renovation

Ca. 80 kWh/m² per year

Recognition of prioritisation of measures among stakeholders and across geographical regions

Allocated ca.150,000 SEK to each accepted property owner => 9,000,000 SEK for 60 owners + investment cost for implemented measures of ca.1,380 SEK per m²

Ca. 60 property owners

Initial uncertainty and knowledge gaps regarding profitability assessments

Continuous programme improvements; support system offering assistance, guidance, and expertise



Duration



Description



Energy savings



Other effects



Cost effectiveness



Level of spread



Obstacles



Success factors

Energy Efficiency Agreement for Industries - FINLAND

2017–2025

To ensure compliance with national energy savings targets and contribute to meeting the EU's shared energy savings target set for 2030

Cumulative annual energy savings until 2020: 8,325 GWh

Improvement in Finland's supply security and new market possibilities for clean technology solutions

Operational costs of the agreement scheme's administration, of ca.1 M€

776 companies joined the Agreement by 2023 (over 90% of the total energy consumption of industry)

Extensive administrative work to ensure timely submission of good quality data

Commitment of participants to set energy efficiency targets and implement actions; robust monitoring and evaluation process



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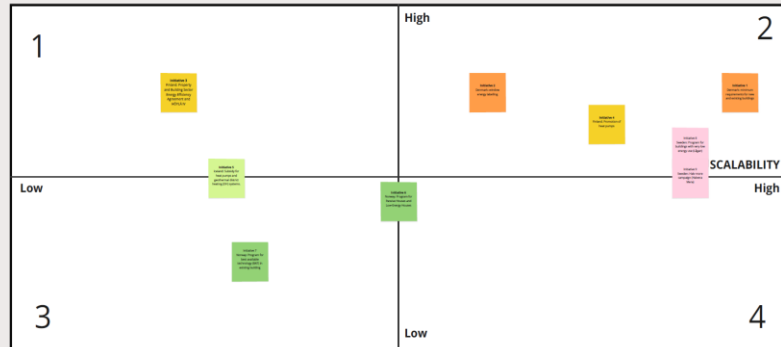
Transferability of exemplary initiatives

Task 1: Initiative sorting for cost-effectiveness and scalability

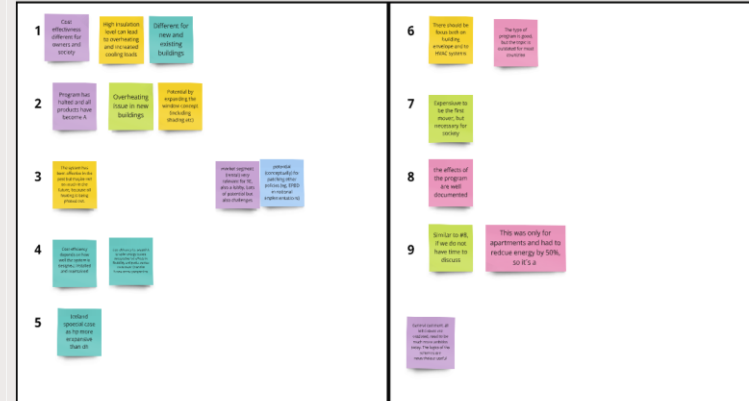
Task: Sort the group's initiatives based on their potential cost-effectiveness (ratio between costs and energy savings => low costs and high energy savings give high cost-effectiveness) and flexibility for possible transferability to other countries. Use the comment box to note down keywords regarding the transferability of each initiative.

SESSION 1
GROUP 1

COST-EFFECTIVENESS (COSTS/ENERGY SAVINGS)



SESSION 1 Group 1 Comments per initiative



CHALLENGES

- Technological and infrastructure constraints
- Misalignment with national policy priorities
- Challenges related to implementation and monitoring
- Industry-specific issues
- Redundancy of certain initiatives

Task 2a: Initiative sorting for relevance

SESSION 2 - GROUP 3 - TASK A (25 min.) FINLAND

For your country: Sort the initiatives from the other countries, for the building and industry sectors, based on their relevance (importance/need) in your country. Use the comment box to note down keywords regarding the relevance of each initiative in the specific country. Consult the findings from the previous group session and the summaries of each initiative when needed.



Task 2b: Transferability investigation

SESSION 2 - GROUP 3 - TASK B (40 min.) FINLAND

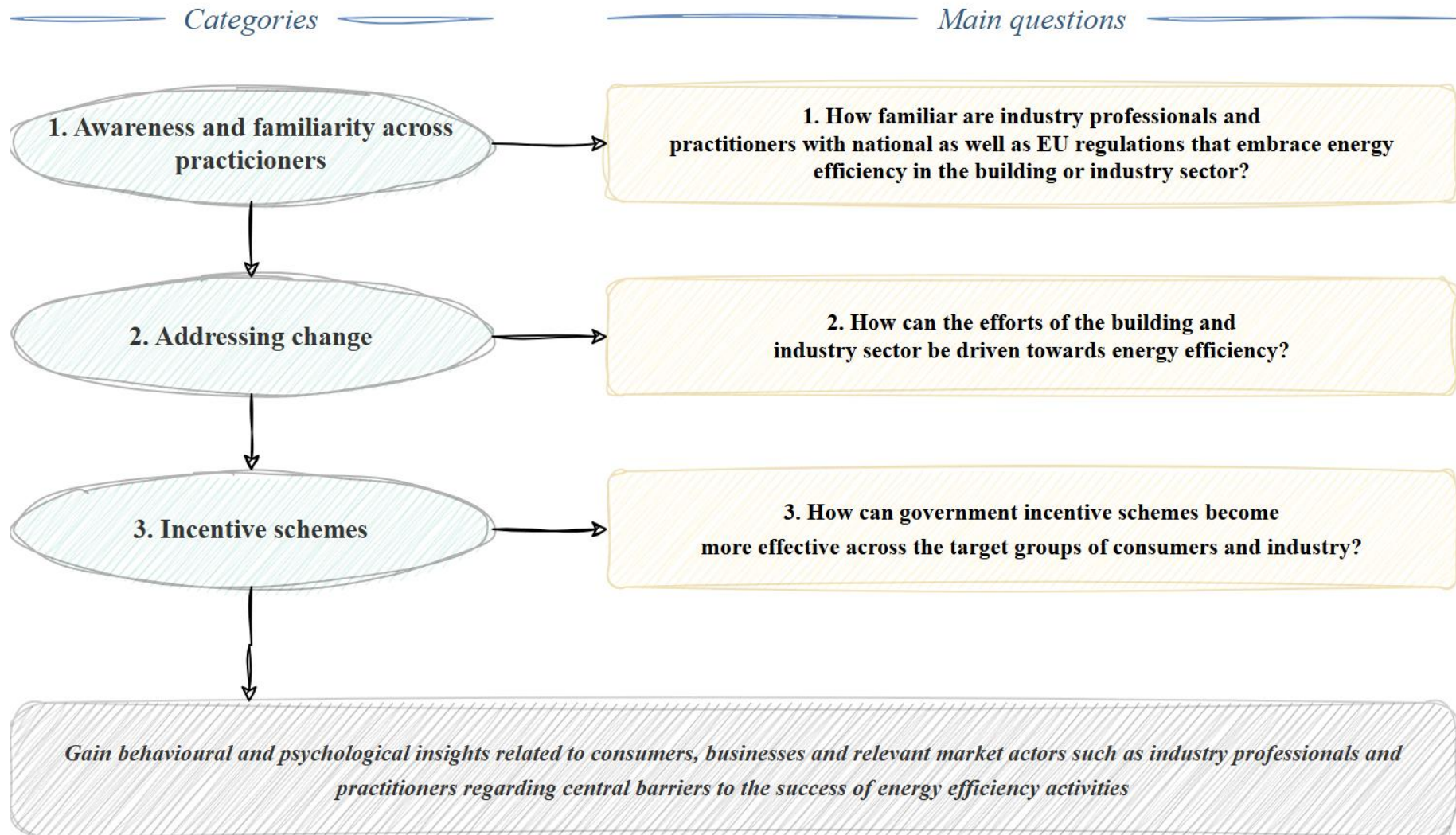
For your country: Select at least 2 initiatives (1 for the building sector, 1 for the industry sector) among the most relevant identified in Task A. Investigate the potential transferability of each initiative to your country, considering necessary adaptations for the local context, potential challenges during implementation, technical measures the initiative would support (refer to the provided non-exhaustive list), and any other relevant factors.

Initiative (#/name)	Needed adaption	Challenges	Technical measures	Other comments
Initiative 7 Norway: Program for best available technology (BAT) in existing building	Both technical measures and improvements to design and installation guidelines to better implement modern HVAC systems (smart control, heat pumps, etc.)	Currently it is politically impossible to introduce any new subsidies	Heat pumps, renewable energy sources, smart control and system integration, and operation and maintenance	Strongly connected to behavioral matters (e.g. demand-response)

Initiative (#/name)	Needed adaption	Challenges	Technical measures	Other comments
Initiative 18 Sweden: Energy efficiency network for small and medium-sized enterprises (SMEs)	We have networking in voluntary agreements but this strengthened, particularly among the SMEs.	How to ensure openness among competitors? Utilising waste heat requires that there is need for it outside the producer.	Cooling technologies, compressed air/Steam, heat recovery, basically any industrial processes	Trust needed among participants and towards to facilitator. Finland has implemented multiple voluntary energy efficiency agreements, of which some include also smaller companies, including SMEs.



Barriers to energy efficiency: Questionnaire





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Some findings from the questionnaire

Barriers

lack of incentives
 little or no government policy
diverse market needs
 complexity of application process
long payback periods
 return on investment uncertainty
 low priority as not part of the core business
competing priorities lack of expertise
bureaucratic hurdles
 energy costs too low to provide economic incentive
insufficient management commitment or unfavorable company environment **high investment risk**
too small amount of money reserved in state's budget
prioritization of other projects lack of awareness
badly constructed incentive schemes failing to deliver
lack of information on energy efficiency opportunities
lack of in-house technical expertise policy and regulatory uncertainty
budget constraints
negative perception of new technologies
lack of awareness about energy efficiency potential
inadequate regulatory push
short-term focus
 lack or high upfront capital cost
 lack of government incentives
 limited access to information

Strategies and Suggestions

customer expectations
 government incentives
 comprehensive strategy
 stricter regulations at eu level
higher leadership commitment
financial incentives
environmental responsibility
 mandatory energy efficiency standard
energy labeling and certification
more local financial support schemes employee engagement
stronger societal focus on benefits of energy efficiency measures
more national financial support schemes
 a more proactive information policy towards (end) users
 research and development funding
regulatory compliance (e.g. esg-reporting)
public awareness campaigns
 stricter regulations at national level
 corporate social responsibility
 regular energy audits and assessments
 international cooperation
educational programs
 health and well-being



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Conclusions and perspectives

- **Prioritizing strategic measures towards common goals**
- **Leveraging exemplary initiatives and supporting transferability**
- **Addressing barriers to energy efficiency implementation**
- **Advancing knowledge through ongoing research and collaborative projects**
- **Project's findings can help countries to exchange experiences and inspire each other**