Descriptions of the topics

3.11 Key questions concerning the recycling of plastics

Maximum amount of available appropriation: EUR 350,000
Time span: 3/2023 – 3/2025

Background and description of information needs, including reasons:

Making the recycling of plastics more efficient is one of the key objectives of waste policy, the circular economy and Plastics Roadmap, a national programme focusing on the circular economy of plastics. The recycling of plastics conserves natural resources, prevents littering, reduces climate impacts and mitigates the risk of plastic pollution in the environment. At the same time, it supports the achievement of sustainability objectives in several sectors of society, such as food production, construction, agriculture and horticulture.

The recovery of plastic packaging waste has developed well in Finland (45 per cent in 2020), but the actual recycling rate of plastic packaging, i.e. the amount that is ultimately used as materials and in products, was only 26 per cent in 2020. This means that Finland still has some way to go before it reaches the targets set in the EU Waste Directive (50 per cent by 2025, 55 per cent by 2030), which are based on actual recycling rates. In addition, the recovery and recycling of plastics from sources other than packaging is still in its infancy. The challenge lies in building recycling value networks and ensuring that they are suitable for many different types of plastic waste.

While views on the factors affecting the development of the recycled plastic market vary greatly between actors in the sector, investments in the production of recycled plastic are widely recognised as a key factor for development (Valve et al. 2022). It is clear that there are many issues hampering the development of the market, including aspects related to the recyclability of products and the use of recycled plastic, and that leverage effects have not been utilised sufficiently.

The recycling of plastics is currently undergoing a major transformation. Separate collection and recycling processes are under development, chemical processes are being introduced and the capacity of recycling plants is increasing. To better anticipate and accelerate these changes, we need more comprehensive, multi-sectoral information on the development of the different stages of plastic recycling, the factors guiding and determining them, and alternative paths of development. Reinforcing the knowledge base will also improve the conditions for business in a developing sector that has a great deal of potential to create new business opportunities.

Some of the challenges are similar in many EU countries, and at the moment, they are also strongly linked to the availability of energy both at the national level and within the single market. Solutions may also be implemented at the EU level or extend beyond Finland’s borders.

At the same time, discussions are increasingly focusing on carbon capture with permanent storage (CCS) and the utilisation of captured CO_2 (CCU). While the introduction of these technologies is still difficult to predict, it may also have spillover effects on material cycles.

The concrete objective of the project is to examine and provide an overview of the current state of plastic recycling, to identify opportunities for development and the factors affecting them in Finland, and to define a selection of methods for achieving the set recycling

targets. The experiences and efforts of other EU countries can be used as a benchmark. The project will conduct an analysis of the entire value network for the recycling of plastics that will supplement existing information and focus on acquiring factual information and problem solving.

The ‘Key questions concerning the recycling of plastics’ project will also contribute to implementing the main objectives and measures of the Plastics Roadmap. The goal is to reach a recycling rate of 60 per cent for plastic packaging, to get the recycling of other plastic products off to a good start, and to achieve an average rate of 30 per cent recycled plastics in several product groups in 2030. The next checkpoint for the Plastics Roadmap is at the end of 2025.

Research questions:

Priority area A: Increasing the recovery of plastics to achieve the recycling targets and meet the needs for recycled plastics, including plastic packaging, WEEE, other municipal waste plastic, and plastics used in construction, agriculture and horticulture (the scope will be specified further in the project implementation plan).

- What are the prospects for developing the recovery of plastics in Finland and Europe, and what factors will influence future development?
- What are the emerging needs for recycled plastic in light of current and foreseeable requirements?
- What potential uses of recycled plastic are in sight and what is the estimated volume of consumption?
- Are the practices being developed for the recovery of plastics in Finland and Europe enough to meet the set recycling targets and the probable needs for recycled plastic?
- In addition to normative controls, what measures are needed to improve the rate of recovery of plastics used in packaging and other applications? How quickly should these measures be implemented?
- How are plastic waste volumes estimated to develop, and what will their potential recovery and recycling routes look like?

Priority area B: Ensuring the adequacy of recycling capacity and the possibility of using secondary materials to replace virgin plastics more extensively.

- How large is the market for recycled plastics and other products derived from the processing of plastic waste in Finland and Europe, and what proportion of the products on the Finnish and European plastic markets are derived from recycled raw materials?
- What does the cost structure and price formation mechanism of recycled plastic look like, and how does the price level of recycled plastic relate to the price of plastic manufactured from virgin material?
- How sufficient is the available and foreseeable recycling capacity and how suitable are the technologies for treating different kinds of plastic waste and for producing recycled plastic? How do mechanical and chemical processes differ in this respect,

and what kinds of plastics are they suitable for processing? How suitable are the current solutions for recycling new kinds of materials?

- How extensively can virgin plastic be replaced with recycled plastic? In which products and with that kinds of recycled plastics?
- What is the definition of recyclability and how does it affect the availability of recycled plastic? How could the recyclability of plastic products be improved?
- Should efforts be made to limit the number of different types of recycled plastics, and how suitable are new bio-based plastics, for example, for the current and foreseeable recycling processes?
- How do additives and other harmful substances (e.g. contamination) in plastics affect the availability and usability of recycled plastic in key product groups? What kinds of solutions are available for reducing the amount of harmful substances in the recycling process and in the final products made from recycled plastics?
- How do the roles and responsibilities of different actors involved in the recycling of plastics affect the recycling of products containing plastic and the supply of recycled materials?
- What factors improve the economic profitability of mechanical recycling, chemical recycling and reuse of plastic?

Priority area C: Methods for mass balance calculation to determine the rate of recycling in the chemical recycling of plastics

- What methods can be used to determine the recycling rate and the content of recycled material in chemical recycling, and what policy approaches are in sight for them?
- What are the advantages and disadvantages of these methods, and how suitable are they for the large-scale recycling of plastics in various products?
- How well are these methods suited to the possible introduction of chemical recycling of plastic in Finland?

Priority area D: Measures to enhance the efficiency of plastics recycling

- Review of selected EU countries and bechmarking
- Measures at the EU level
- National measures

Link with decision-making and preparation in the Government:

The objective of the updated Plastics Roadmap adopted by the ministers responsible for climate and energy in spring 2022 is to bring about the breakthrough of a circular plastics economy in Finland by 2030. Making the recycling of plastics and the use of recycled plastics more efficient are among the main objectives of the programme, and major changes are currently taking place in the relevant value networks. Joint measures by the ministries and a stronger knowledge base are needed to accelerate development in this area.

Reporting:

The researchers must produce at least one interim report on the project and a final report (in Finnish) in line with the Government's analysis, assessment and research guidelines. The final report must include an expanded summary of the project contents and results in English. Translation costs must be taken into account in the project budget.

References:

Valve, H. et al. (2022) Muovijätteestä tuotteeksi: toimijoiden visiot uusiomuovimarkkinoiden kehittämisestä [From plastic waste into products: Actors' visions of the development of the recycled plastics market]. Suomen ympäristökeskuksen raportteja 2/2022.

4.1 NATO's nuclear deterrence and Finland

Maximum amount of available appropriation: EUR 100,000
Time span: 3/2023 – 12/2023

Background and description of information needs, including justifications:

Finland's security policy environment has fundamentally changed since the Government last conducted an analysis, assessment and research project on the topic in 2018 ("Strategic incident Redux: Nuclear Weapons and European Security)" (see Michel & Pesu 2019).

This is due to developments in international security policy, in which the importance of nuclear weapons has become emphasised in recent years as a result of increased competition between major powers. All nuclear powers stress the importance of nuclear weapons for their security and for the stability of the international system. Nuclear deterrence and nuclear weapons play a key role in the international security system. As different domains of operations are interconnected, the role of nuclear weapons cannot be separated from conventional warfare. The cyber and space domains, for instance, are also strongly linked to nuclear deterrence.

NATO's overall deterrence consists of three elements: conventional forces, missile defence and nuclear weapons. It is further complemented by cyber defence and space capabilities. All member countries are committed to NATO's nuclear policy and may, if they so wish, participate in the preparation of nuclear policy matters in the Nuclear Planning Group (NPG). The group deals with issues related to the placement and safety of nuclear weapons and prepares the Alliance's common positions on nuclear disarmament. All member countries except for France participate in the work of the NPG.

As it has applied for NATO membership and will soon be a member of NATO, Finland must have a comprehensive understanding of nuclear weapons, as well as of the significance of NATO's nuclear deterrence and its effects on Finland as a member of the Alliance. Nuclear deterrence is a new theme on the long continuum of Finland's foreign and security policy, and competence related to it is scarce at the national level. A significant change is currently under way, and it requires further analysis.

Research questions:

Nuclear weapons have traditionally been examined in Finland from the perspective of nuclear arms control and disarmament. NATO membership places a new emphasis on the perspective of deterrence. This means that Finland needs new kinds of expertise and policy guidelines at the national level. It is crucial to increase knowledge-based understanding of the matter in order to support the administration, decision-makers and the public discussion.

- Will NATO's nuclear deterrence bring changes to Finland's long-term approach to nuclear disarmament?
- What does NATO's nuclear deterrence mean? What does it mean for individual NATO member countries?

- NATO member countries are committed to the Alliance's nuclear deterrence: How do NATO member countries take a stand on nuclear deterrence or what kind of positions are member countries required to formulate? How do the positions of the member states differ from one another?
- With regard to nuclear deterrence, what responsibilities does NATO membership place on Finland, and what choices will Finland be able to make?
- What issues related to nuclear deterrence should Finland be prepared to take a stand on as a member of NATO?

Research bodies may present alternative and/or complementary questions or perspectives in their research plan. Research bodies are also encouraged to engage international experts/researchers in the project's activities/consortium.

Link with decision-making and preparation in the Government:

The research will improve Finland's competence on nuclear deterrence at the national level, which will be used in the preparation of policy guidelines, in decision-making and when formulating Finland's positions. In addition, the research will support and stimulate knowledge-based public discussion and will support the media sector. The research can also be regarded as a kind of message to international actors concerning Finland's preparations for NATO membership. In addition, it will play a role in preventing the potential dissemination of disinformation and misinformation on the topic.

The results will contribute to the preparations for Finland's NATO membership and, later, to Finland's work in NATO. The study will provide a knowledge base on the links between the administrative branches and NATO's nuclear deterrence and on Finland's position in NATO's nuclear sharing arrangements. The results will support preparations for Finland's work with the NATO Nuclear Planning Group (NPG) and can support planning and decision-making related to the Defence Forces' exercises. In addition, the research will produce a knowledge base related to arms control and the Treaty on the Non-Proliferation of Nuclear Weapons.

Reporting:

A final report (in Finnish) must be produced on the project, along with comprehensive summaries in English and Swedish, in line with the Government's analysis, assessment and research guidelines. Researchers are also encouraged to produce intermediate deliveries of different types or on different themes (policy briefs, working papers, etc.). The background materials or results of the research may also contain material that is to be kept secret under the Act on the Openness of Government Activities. If necessary, the implementers of the research may be subject to security clearance.

References

Michel, L. & Pesu, M. (2019) Strategic Deterrence Redux: Nuclear Weapons and European Security. Publications of the Government's analysis, assessment and research activities 2019:52.