Support to the renovation wave - energy efficiency pathways and energy saving obligation in Estonia: Final inception report

(REFORM/SC2022/067)

Trinomics


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Contract details
DG REFORM

Support to the renovation wave - energy efficiency pathways and energy saving obligation in Estonia

(REFORM/SC2022/067)

Presented by

Trinomics B.V.
Westersingel 34
3014 GS Rotterdam
The Netherlands

Contact person

Mr. Peter Lemoine
T: +41 78 641 14 91
E: peter.lemoine@trinomics.eu

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Support to the renovation wave - energy efficiency pathways and energy saving obligation in Estonia (REFORM/SC2022/067)

In association with:

TAL TECH

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Executive Summary

This inception report is the first deliverable for the DG REFORM project, "Support to the renovation wave - energy efficiency pathways and energy saving obligation in Estonia" (REFORM/SC2022/067). During this project, we will be supporting the Estonian Ministry of Economic Affairs and Communication (MEAC) in formulating and writing a national energy efficiency policy covering all main economic sectors.
Project deliverables are designed to result in the following objectives in Estonia:

- Objective 1: Energy efficiency targets are adopted as part of the Energy Sector Development Plan until 2035 and the National Energy and Climate Plan based on a detailed energy efficiency pathway and action plan.
- Objective 2: New policy measures for achieving Estonia's energy saving obligation are adopted. These will cover several sectors and shall be closely interlinked with other energy efficiency policies.

The project team will provide the deliverables according to request of service and in this inception report to support the achievement of these outcomes. However, the project team cannot ensure the government's achievement of the above. Project progress will be measured per the process and result indicators outlined below.

The main purpose of the project inception phase is to outline a detailed methodology of how deliverables will be carried-out, and to agree on this methodology with DG REFORM and MEAC. In this report, we provide our detailed methodology to carrying out the following deliverables:

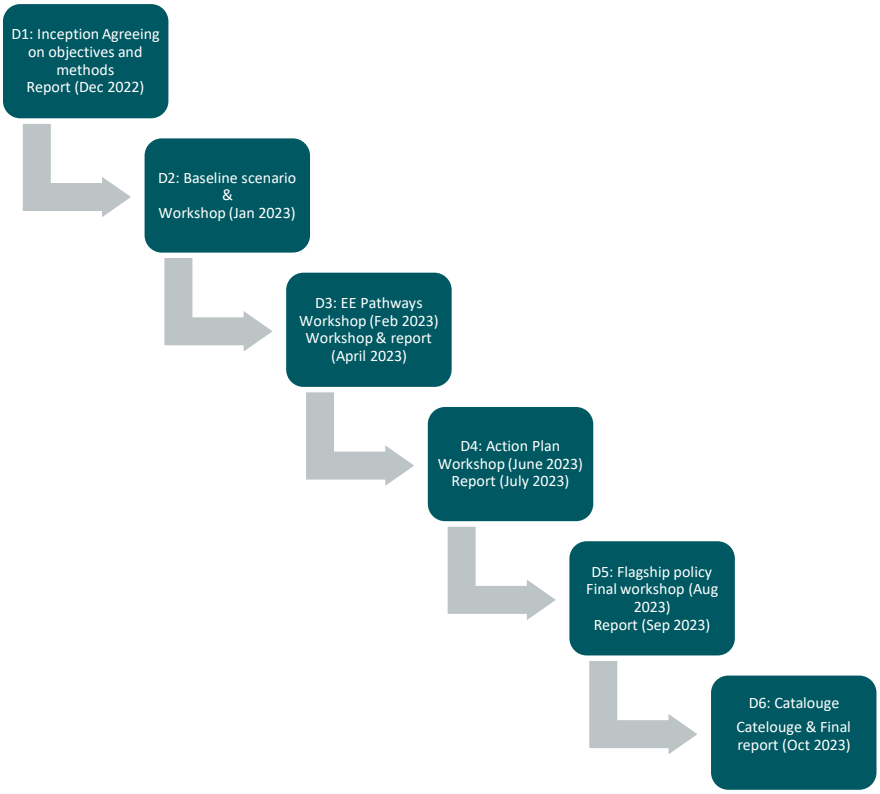
- ✓ Deliverable 2: Report on data collection and baseline scenario
- ✓ Deliverable 3: Comprehensive study of energy efficiency pathways for Estonia
- ✓ Deliverable 4: Action plan for implementing the optimal energy efficiency pathway
- ✓ Deliverable 5: Detailed concept of the energy efficiency flagship policy, including a monitoring and verification approach
- ✓ Deliverable 6: Catalogue of energy saving measures and calculation methodologies

We also outline the following in this inception report:

- Key data needs and assumptions
- Steering group composition and modes of working
- List of key stakeholders
- Indicators to monitor project progress
- Communication and organisation
- Project schedule
- Kick-off meeting minutes (Annex)

The next deliverable – the baseline study – will be provided in draft form in December 2022 and finalised in January 2023.

To summarise, the flow of the main project activities and deliverables is a below ("D" = Deliverable).



Communication activities for this project will be produced in accordance with Annex III Communication and visibility requirements.

1 Deliverables and methodology

1.1 Deliverable 2: Report on data collection and baseline scenario

Deliverable 2: Report on data collection and baseline scenario	
Aim	• To collect and analyse the data needed for as-is analysis and for the development of a baseline scenario. • To provide a detailed mapping and analysis of all current energy efficiency policies already in place or planned in Estonia, along with (at least) 10 key barriers to EE and an analysis of the institutional setup. • To conduct modelling to develop Baseline scenario for 2050 based on "As-is "data report.
Tasks	• Carry out desk research • Consult relevant public and private stakeholders • Database development, including data quality assessment • Baseline scenario development, including critical barriers and institutional setup as well as workshop validation
Outputs	• 1 workshop • Developed Baseline scenario with supporting excel files

Within this task, a database will be created, which will include a compendium of data as well as non-quantitative information. The main purpose of this task is to collect and organise data in order to compile a database on energy efficiency in the building sector (residential, public, service buildings), as well as in transport and industry sectors. Structured information will be presented based on consultations and interviews with public and private stakeholders, as well as a review of pertinent reports, strategies, and plans. The database and the working paper will be used to develop a baseline scenario. The data will be entered into an Excel-based database, with the data organised by various types, each on a different sheet. The data and information gathered will be used to create the baseline scenario up to 2050, which will also be documented in Excel.

1.1.1 Task 2.1 Carry out desk research

The primary goal of this task is to collect and organise data in order to create a database energy consumption and energy efficiency in all final energy sectors. Data on energy efficiency in building sector (including residential, public, service buildings), service, transport and industry sectors will be collected and evaluated, as these sectors have the highest potential to save energy.[1] The primary data sources will be Eesti Statistikaamet (Statistics Estonia), Eurostat (European Statistics), the Estonian Transport Administration, the Estonian Environment Agency, Tallinn University of Technology, and the Health Statistics and Health Research Database. Additional information will be gathered through various strategies, plans and studies that have been prepared in cooperation with MEAK (e.g., Long Term Renovation Strategy, Estonian gas system energy efficiency improvement strategy, report on the impact of measures financed via EU structural funds on the achievement of the country's energy economy

[1]Sectors covered result from EED revision article 4 and REGULATION (EC) No 1099/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 October 2008 on energy statistics.

objectives, etc.). Based on the results of Task 2.1 and 2.2 the most critical barriers (at least 10) to energy efficiency in Estonia will be analysed in-depth. This will include analysing the institutional setup and potential gaps, based on a sound methodology. Available energy saving measures, costs and impacts will also be discussed with KredEx and other main grant provider of building renovations in Estonia. The quality of data will be assessed by comparing it to other national and international data, expert knowledge and objective criteria like ratio of inconsistencies in data, timeliness, coverage and completeness of data. The barrier analysis will form part of the 'As is' report. We will use stakeholder engagement (Task 2.1) to validate the findings and support with gap filling.

1.1.2 Task 2.2 Consult relevant public and private stakeholders in Estonia

Public and private stakeholders will be approached after the preliminary data from literature has been reviewed as their input is vital for the completion of the deliverables. We plan to conduct at least 20 interviews and hold a workshop as part of the stakeholder consultation process.

Interviews with key public stakeholders will be conducted for input (see list of stakeholders below). The goal of the interviews is to get input on the topics related to relevant stakeholder areas, both in public and private sector. The input from the stakeholders will be basis for further research. For private enterprises, corresponding unions and associations will be contacted, while some of the most relevant enterprises could be contacted directly. These interviews started in November 2022 and will continue until the 2022 Christmas holidays. A short summary of the input from stakeholders will be provided in deliverable 2.

We also expect to involve stakeholders in the seven workshops which will be organised throughout the project. Our overarching approach to workshops is presented below. Following each workshop feedback provided during the workshop will summarised in written format and sent to workshop participants for further comment one week following the workshop. Participants will then have one week to provide further written comments.

Workshop organisation will be led by the Consortium in conjunction with MEAC.

Our approach to conducting workshops

Multiple workshops will be organised throughout the project. This box outlines our approach to the workshops.

Overview of workshops to be organised

Deliverable	Workshop	Remarks
2	1 workshop	Conducted together with the workshop envisioned for D3
3	1 workshop	Conducted together with the workshop envisioned for D2
	2 interim workshops	Which will be split into multiple sessions covering different sectors
	1 final workshop	-
4	1 workshop	Which will be split into multiple sessions

5	1 final workshop	To incorporate feedback from international workshop if timing allows

The project team will work closely with the steering group to:

- Identify all relevant stakeholders whom to extend the invitation to;
- Decide on the agenda and format of events;
- Prepare materials to be used during the presentations;
- Lead the workshop to assure all the topics of the report are covered to clarify and identify possible pathways and solutions;
- Prepare a summary of the workshop and share it with all participants after the event.

The following outlines details of the format of workshop events

- Workshop locations (in-person v. virtual) are to be determined pending the situations at the time of the workshops, e.g., health and safety concerns related to the COVID-19 pandemic.
- In-person workshops are preferred
- Virtual is acceptable if conditions do not allow for in-person workshops, or if the project team, in conjunction with the beneficiary and the Commission determine there is no value added in holding the workshops in-person.
- Virtual workshops will be held using an online platform such as Teams or Zoom.
- Where physical or hybrid workshops are required, these will take place in Estonia (per the ToR, in rooms provided by MEAC, if possible).
- Workshops will mostly be held in Estonian and the presentations of workshops will be translated to English where appropriate. Scope and discussed points will be shared beforehand to ensure that participants will stay on topic and can properly prepare. Where workshops are held in Estonian, minutes will be taken in Estonian and shared with participants for further feedback within 3 working days. Where appropriate, the meeting minutes will also be translated to English.

A sample agenda for the workshops is provided below.

09h30 – 09h35	Opening and welcome
09h35 – 09h45	Objective of the workshop
09h45 – 10h30	Presentation on the topic
10h30 – 11h15	Q&A / Reflection
11h15 – 11h20	Closing remarks

1.1.3 Task 2.3 Database development

The database will include historical data on energy consumption and energy efficiency indicators in commercial and public services (including buildings), households (including buildings), transport, industry and other final energy sectors (agriculture, forestry, fishing) sectors and macro economy data (GDP; value added, heating and cooling degree days etc) during the last ten years. The structure of the data collection for each sector will be the same, with the exception of sector-specific indicators. An additional sheet with a source list and a self-control sheet will be included allowing for direct quality control of the data. There will also be information on energy taxes (fuel and energy excise taxes). A list of EU and Estonian energy efficiency measures implemented in the last 10 years and planned for future implementation will be added based on desk research, staff experience, and feedback from stakeholders (outcomes 2.1 and 2.2.). The list will include information on energy taxes (including fuel and energy excise taxes). Both general energy efficiency measures, such as energy excise taxes and requirements for remotely readable electricity/gas meters will be analysed for the following energy

end-use sectors: buildings, in both the public and private sectors, as they account for the largest share of final energy consumption and the potential for energy savings is probably economically the most viable (i.e. renovation of apartment buildings, minimum energy performance requirements for buildings, etc.); transport, as without the implementation of measures, energy consumption would increase significantly, which would in turn lead to increasing dependence on imports of liquid fuels (i.e. compulsory training in sustainable driving, Time-based road use fee, etc.); industry, as this is the third most important end-use sector, where energy consumption and prices are increasingly affecting the sector's competitiveness (i.e. Resource efficiency measure to promote investments in work processes, investment in best available techniques, support to resource management systems combined with IT applications, etc.). Extensive quality control, including the monitoring of update operations and the control of formal guidelines, will be carried out to assure the high quality of the database content. An additional sheet with a source list and a self-control sheet will be included allowing direct control over inputted data. In addition to the database quality control, a quality check will be performed by a project team expert who was not involved in the database development. This data will form the basis of the 'As is' report. We will use stakeholder engagement (Task 2.1) to validate the findings and support with gap filling.

Some additional important points about the database:
1. All data will be compiled in Excel format with sources, including equations, raw data, etc.
2. The summary database, which will technically be owned by the European Commission, will also be publicly available – we envision this database will be housed on a government website (but only the final database, not live worksheets with equations, or raw data, etc.)
3. Data will be available for review stakeholders

1.1.4 Task 2.4 Baseline scenario development

Existing Taltech models will be used as the basis for the Baseline scenario up to 2050 by assuming that existing financial commitments decided until 2026 and other energy policy measures will be continued up to 2050. As a support to the Renovation Wave, the most detailed analyses will be conducted for residential and non-residential building stock. The TalTech building stock model developed for Estonian Long Term Renovation Strategy preparation will be used. This model includes all main residential and non-residential building category volumes based on the Estonian Building Registry database, specific energy uses of old, deeply renovated and new buildings, and is calibrated against energy statistics data (electricity, fuels, district heat), providing "as is" energy data for the 2020 building stock, which represented 50% and 52.5% of the final energy consumption in Estonia in 2019 and 2020, respectively (2020 is an exceptional year due to COVID-19). In the baseline scenario calculation, deep renovation rates, new construction rates and demolition rates as well as changes in heat source distributions and on-site installation of photovoltaic will be applied according to decided energy efficiency measures following existing policies. For the development of the transport baseline scenario, data from National Transportation Agency registry will be used as input for baseline information on types and ages of vehicles, fuel types. National data is used on average trip lengths of different vehicle types. For modelling, the Low Emissions Analysis Platform (LEAP) for integrated energy planning and climate change mitigation assessment is used. For industry and other end use sectors included, modelling will be conducted to calculate the total end use of electricity, fuels, district heat and district cooling up to 2050.

The baseline scenario will account for existing policy measures currently implemented WEM (With Existing Measures) – we will assume these measures will continue to 2050, but that no additional policy measures will be implemented.

The results will be reported in the Deliverable 2 report, including supporting excel files with references to sources used (the Excel will not include modelling conducted with other tools than the Excel.) and equations. A workshop will be organised to stakeholders to present the draft report and the baseline scenario (see textbox above). Stakeholder feedback obtained during the workshop will be integrated to finalise Deliverable 2.

1.1.5 Leveraging of previous work

Previous work done will provide the basis for this deliverable. This work includes:

- LTRS Long Term Renovation Strategy
- Building stock hourly model
- ODDYSSEE-MURE Estonia energy profile
- Estonian Energy Roadmap 2021-2031-2040 (Rohetiiger)
- Heat pump potential in the Baltic States (Nordic energy research)
- H2020 Heron: energy policy and measures in buildings and transport
- Scenarios for electricity and heat production and use of transport fuels and impact assessment with LEAP and EcoSenseWeb for the National Energy Development Plan 2020
- National studies:
    - https://energiatalgud.ee/node/8911?category=1697
    - https://energiatalgud.ee/node/8928?category=1713
    - https://energiatalgud.ee/node/8919?category=1706
    - https://www.mkm.ee/ehitus-ja-elamumajandus/analuusid-ja-uuringud
    - https://www.mkm.ee/energeetika-ja-maavarad/analuusid-ja-uuringud#energiathusus
    - https://www.mkm.ee/transport-ja-liikuvus/analuusid-ja-uuringud
    - https://envir.ee/kliima/toetavad-materjalid/kliimavaldkonna-uuringud
    - Transitioning to a climate-neutral electricity generation (Estonia)
    - Transitioning to a carbon neutral heating and cooling in Estonia by 2050
- Other studies

1.1.6 Estimation of final and primary energy impacts

In this Deliverable, we cover all end energy use sectors so that all of Estonian's current 33 TWh final energy use will be reported, and a baseline scenario will be calculated. In our analysis we will develop a breakdown according to common use categories in energy statistics, and also by energy carrier. The most detailed calculations can be produced for buildings, which cover 50% of the final energy use. In buildings we can produce delivered energy (final energy) and exported energy values for the following energy carriers:

- Grid electricity
- District heat
- Gas
- Biogas
- Wood (for boilers/higher efficiency)
- Wood (for stoves/lower efficiency)
- Oil
- Coal

Photovoltaic electricity generated in buildings will also be calculated. The self-use of photovoltaics will reduce delivered grid electricity to buildings, with the surplus exported to the electricity grid.

For industry, transport and other sectors we will provide a breakdown of district heat, fuels and grid electricity.

Results of these final energy calculations can be converted to primary energy values for electricity and district heat. For grid electricity and district heat, transmission/network losses are to be accounted for[2], and from these values' primary energy can be calculated depending on production modes and fuel mix used in the production (are not calculated in this work).

1.2 Deliverable 3: Comprehensive study of energy efficiency pathways for Estonia

Deliverable 3: Comprehensive study of energy efficiency pathways for Estonia	
Aim	The provision of this deliverable should enable Estonia to: 1. Understand in detail the expected benefits and costs, as well as risks, of various energy efficiency policy options, configurations, and combinations for a range of relevant indicators. 2. Based on this improved understanding, set the optimal level of ambition for energy efficiency targets in Estonia in the context of its NECP update and the National Development Plan of the Energy Sector until 2035. Furthermore, it should allow Estonia to define the optimal contribution of energy efficiency compared to other decarbonisation options, taking into account requirements from EU legislation and the energy efficiency first principle. 3. Take informed decisions on the detailed policies and measures to be introduced/changed in order to achieve this ambition.
Tasks	• Pathway identification, including desk research; • Organise first workshop on proposals for pathways, which will support the reaching of agreement on the final list of pathways to be analysed; • Pathways analysis, including developing pathways in detail, carrying out sensitivity analysis, carrying out at least 20 interviews, organising interim workshops that will inform the draft report, and a final workshop to present the final analysis
Outputs	• 4 Workshops, of which the first one could possibly be combined with D2's workshop • Draft report • Final report

Task 3.1 Pathway identification

The team will develop draft pathways prior to the workshop organised in Deliverable 2 based on desk research on following research questions:

- What are the main barriers to achieving Estonia's energy efficiency goals?
- How do current EU and Estonian policies address these barriers?
    - Which EU laws have been transposed to Estonian law? What is the extent of the transposition? Is Estonian law more ambitious than EU law?
    - What results have policies yielded?
    - How has the structure of public and private responsibilities contributed to or created barriers?
- What are the policy gaps?
- What have other countries done to address such gaps? For example:
    - Energy efficiency obligation schemes in Italy and France
    - Voluntary agreements in Belgium

[2] Electricity transmission losses will be sourced from: https://www.energiatalgud.ee/Võrgukaod:_elekter. District heating losses will be sourced from the Estonia Energy Roadmap.

- E-mobility policies in Norway

The outcomes of this research will be used to create at least five pathways, in collaboration with MEAC and DG REFORM, prior to the workshop. The following seven pathways are illustrative of the types of scenarios we expect to emerge from the desk research. The first three pathways are based on the requirements specified in the ToR.

1. **Baseline (Base)**: The baseline pathway developed in Task 2.
2. **Energy efficiency obligations (EEO)**: Th EEO pathway will look at the impacts of implementing an energy efficiency obligation scheme (EEO) per Article 7 of the EU Energy Efficiency Directive.
3. **Voluntary agreements (VA)**: VA will reflect the introduction of voluntary agreements by industry to increase energy efficiency of manufacturing facilities.
4. **Renovation wave** (**Renowave)**: Renowave will examine the impacts of doubling the current energy weighted renovation rate of 1.0%/year in Estonia to 2%/year.
5. **Energy efficient transport** (**EET**): EET will look at the impact of energy efficiency improvements in the transport sector (e.g., increased public transport, electrification, biogas).
6. **Comprehensive energy efficiency reform 1 (CEER 1)** will account for the combined impacts of EEO, Renowave, and EET.
7. **Comprehensive energy efficiency reform 2 (CEER 2)** will look at the combined impacts of EEO, VA, and EET.

Each pathway will include a detailed description of the policies and measures it includes. Per the terms of reference, the goal is to include 10 new or existing policies per pathway, understanding that some such policies may be sub-policies of main policies (for example, renovation targets will have various sub- policies designed to help achieve the targets), and that the aim is to have pathways that are specific and well detailed. In some cases, the complete pathway may not include 10 individual policies when it is clearly justified and agreed on with MEAC.

Other policies and mechanisms will be accounted for in different scenarios, the most important of which are the EPBD, including minimum energy performance standards (MEPS) for buildings proposed in the EPBD recast, and the EU Emissions Trading Scheme (EU ETS for industry, and also the proposed expansions to buildings and transport), as well as the Renewable Energy Directive (RED II) and Energy Efficiency Directive (EED) including a public buildings renovation target. Incorporating RED II is important because of synergies between renewable energy and energy efficiency: for example, heating and cooling; further, the Energy Efficiency First principle states that energy efficiency measures should be implemented to reduce load and minimise the need for additional electricity generation.

Task 3.2 Workshop on proposal pathways

Proposed pathways developed in Task 3.1 will be presented and discussed during a **session at the workshop organised during Task 2**. The objective of the session will be to gather feedback from stakeholders that can be used to update and improve proposed scenarios or remove some scenarios while adding others such that a revised set of pathways can be developed.
Descriptions of proposed pathways will be sent to workshop attendees in advance of the workshop. Descriptions will include:

- Pathway name and short summary
- Polices to be modelled
- Main data sources and assumptions (developed under Deliverable 2)
- Value-added of modelling pathway, e.g., “Modelling VA is important for illustrating the impacts of voluntary agreements relative to the Base case and EEO pathway.”
- Key uncertainties and risks

Following this workshop session, the team will update the proposed pathways and send them to stakeholders for additional comment.
We will also conduct at least twenty 60-minute **semi-structured interviews** with public and private stakeholders to inform the in-depth development of the pathways and ensure that included policies and measures are realistic and all potential risks and barriers are considered. The list of public stakeholders who may be contacted for interviews is shown under our approach to Deliverable 2.

The list of private stakeholders is inclusive of:

1. Relevant associations who represent energy intensive sectors or industries
2. Enterprises in the field energy efficiency
3. Input from the Steering Committee

Potential private stakeholders may include:

Stakeholder	Web site	Reason for interviewing
Balti Vara Ehitus OÜ	https://www.baltivara.ee	No 1 deep renovation contractor in EE
Delta E Engineering	https://www.deltae.ee/en/	Energy, resource and environmental efficiency solutions for industry and commercial buildings
R8 Technologies	https://r8tech.io	Energy management and virtual power plants in commercial buildings
Sunly AS	https://sunly.ee	Renewable energy developer
Timbeco Ehitus OÜ	https://timbeco.ee/en/	Prefabricated renovation solutions
Utilitas OÜ	https://www.utilitas.ee/en/	Largest district heating provider in Estonia (Tallinn)
Nordic Energy Solutions		Energy analyses and simulations for new and existing buildings, including energy performance minimum requirements compliance assessment and EPCs
AS Estonian Cell	https://www.estoniancell.ee/	Industry (wood and paper)
AS Enefit Power	https://www.enefit.com/technology/power-production	Industry (Chemistry and energy)
Nordic Milk (Tere/Farmi)	https://nordicmilk.eu/	Industry (Food)

Semi-structured interviews involve developing a pre-determined set of questions sent to interviewees ahead of interviews. During semi-structured interviews, interviewers can ask follow-up questions. Interview notes will be sent to interviewees for validation. We will then collate interview notes with the aim of summarising key interview takeaways that can be used to inform development and analysis of the final pathways to be analysed. Additional desk research may be conducted based on interview outcomes. Revised pathway descriptions, including descriptions of main policies in each pathway, will be agreed on with MEAC and DG REFORM before draft modelling and other analyses.

Task 3.3 Pathway analysis and selection of optimal pathway

Draft analysis of each pathway will include in detail the following:

- Mapping of involved actors, including structure of responsibilities of public and private sector players
- Identification of potential barriers
- Pros and cons of the pathway (including main policies therein)
- Impact assessment, including savings and costs, and other direct, indirect or induced impacts, including regional impacts at the NUTS 3 level
- Risk analysis – mapping of uncertainties in the pathway to technical, social, economic, environmental and other risks, and potential mitigation strategies, as well as risks linked to policy adoption and implementation of the key policies and actions
- Sensitivity of impacts to exogenous factors (energy prices and costs, labour, climate, etc.). The sensitivity analysis will be of a formative or qualitative nature. For example, we will characterize sensitivity of the pathway to energy prices as high, medium or low, and provide a description of why we ascribe this sensitivity value to the pathway.
- Other considerations, where relevant, for example:
    - Energy prices
    - Digitalisation
    - Electrification

Two interim workshops will be held to vet updated pathways and draft modelling results with stakeholders. During the workshops, criteria for selecting the **optimal pathway** will be discussed. We propose the following draft set of criteria:

1. **Relevance** is the extent to which the pathway is meeting Estonia's energy efficiency objectives. Evaluating relevance involves looking at the relationship between the barriers to energy efficiency and Estonia's objectives.
2. Evaluation of **effectiveness** involves looking at the extent to which the pathway will meet objectives (energy efficiency and savings targets).
3. **Efficiency** will measure the cost-effectiveness of the pathway, when possible.
4. **Coherence** involves looking at how well or not different policies work together. Areas that are coherent between polities are synergistic and could improve overall progress towards objectives.

The final set of decision criteria will be agreed on with MEAC and DG REFORM. An **optimal pathway** will be selected based on further analyses along the selected key decision criteria. This analysis will be described in the **draft report**.

Our proposed report outline is as follows:

- Estonia's energy efficiency goals (quantitative, descriptive & system boundaries)
- Main barriers to achieving these goals (policy, market, financial, capacity, technical and social barriers)
- Current EU and Estonian policies addressing these barriers and expected results
- Identification of the remaining gaps

- Identification of the main possible pathways to fill in the gaps
  - Energy efficiency obligations (EEO)
  - Voluntary agreements (VA)
  - Renovation wave (Renowave)
  - Energy efficient transport (EET)
  - Comprehensive energy efficiency reform 1 (CEER 1)
  - Comprehensive energy efficiency reform 2 (CEER 2)
- Comparison Assessment of the pathways (using relevance, effectiveness, and coherence as criteria)
- Selection of optimal pathway, including a recommendation for Estonia's energy efficiency ambition to be included in the NECP
- Annex: example of practices in other MSs (e.g. Energy efficiency obligation schemes in Italy and France; Voluntary agreements in Belgium; E-mobility policies in Norway)

A **final workshop**, which will include high level decision makers, will be held to discuss the draft report. Feedback from the workshop will be summarised and sent to workshop participants. Following this, we will prepare the **final deliverable 3** for submission to MEAC and DG REFORM (in English).

Clarifications agreed upon during KoM

The following clarifications to the scope of work for Deliverable 3 were agreed on during the project kick-off meeting:

- Workshop locations (in-person v. virtual) are to be determined pending the situations at the time of the workshops, e.g., health and safety concerns related to the COVID-19 pandemic.
- In-person workshops are preferred
- Virtual is acceptable if conditions do not allow for in-person workshops, or if the project team, in conjunction with the beneficiary and the Commission determine there is no value added in holding the workshops in-person.

1.3 Deliverable 4: Action plan for implementing the optimal energy efficiency pathway

Deliverable 4: Action plan for implementing the optimal energy efficiency pathway	
Aim	Provide the Estonian authorities with a detailed implementation action plan up to 2035 and less detailed action plan until 2050 for the optimal pathway identified under deliverable 2.
Tasks	♦ Draft detailed action plan; Workshop on draft plan; Finalise action plan
Outputs	♦ Final action plan

Task 4.1 Develop detailed action plan

We will specify detailed plans for implementing policies included in the optimal pathway. The action plan will explain in detail the required legislative, regulatory, fiscal, institutional and procedural changes and reforms that Estonia should undertake and provide high-level recommendations for the changes to be made in order to implement the optimal pathway. The plan will include at least 10 key

actions as well as detailed recommendations for the implementation of each of the key actions (with the aim to write at least 10 pages per key action,), including detailed recommendations for legislative, regulatory or institutional changes where applicable.
The action plan will clearly take into account any bottlenecks, for example with regard to financing, administrative capacities, private sector skills and how to overcome those.
Particular emphasis will be placed on ensuring that public and private funding sources to support the implementation of the pathway will be identified and available, and the timetable shall provide detailed planning for government actions in this regard.
Building on the risk analysis carried out under deliverable 3, for at least the 5 actions with the highest risks, detailed suggestions for alternative options should be included in case the identified risks materialize (for example alternative configurations of the policies to be implemented or other appropriate mitigation measures).

Implementation plans will lay out the government capacity requirements and cost estimation, the timeline for designing and implementation, stakeholders to involve, KPIs to fix, milestones, interlinked policies, influencing factors, knowledge required, and the market needs (e.g., for the Renovation Wave, what is the current capacity of the construction sector and how will it need to evolve to double renovation rates?).

Actions will be specific, measurable, attainable, realistic and time-bounded.

Implementation timelines will be aligned with national decision-making timelines for related efforts, including wider decarbonisation agendas (policies, measures, and funding).

In leading the plan development, Trinomics will leverage our experience working on related efforts throughout the EU, including our recent experience:

- Supporting DG ENER with the EPBD and RED impact assessments
- Supporting DG ENER with a heating and cooling decarbonization roadmap
- Supporting Ireland and Malta with the long term renovation strategies
- Supporting Estonia with a heating and cooling decarbonization action plan

It was noted during the kick-off meeting that the Department of Construction and Housing is working on buildings efficiency already developing plans. Our project team will coordinate with the government unit to ensure we are complementing and adding to their work.

Task 4.2 Action plan workshop

We will organise a one day workshop with relevant public and private stakeholders to present the draft plan. We proposed to have sessions on finance, government capacity, and market needs, as well as plenary and closing sessions. See also our general approach to workshops under deliverable 2.
Feedback gained during the workshop will be summarised in written and sent to MEAC,DG REFORM, and to workshop participants within one week of the workshop. Stakeholders will then have one week to provide any further writing comments.

Task 4.3 Finalise action plan

The action plan will then be finalised based on workshop feedback, and further discussions with MEAC and DG REFORM.

1.4 Deliverable 5: Detailed concept of the energy efficiency flagship policy, including a monitoring and verification approach

Deliverable 5: Detailed concept of the energy efficiency flagship policy, including a monitoring and verification approach	
Aim	To further conceptualise and describe in detail the recommended flagship policy for achieving Estonia's energy efficiency obligation under the agreed optimal scenario identified and analysed during the conduct of deliverables 3 and 4.
Tasks	Analysis of best practices; Policy gap and barrier analysis; Analysis of M&V approach; Analysis of EE related IT systems; Development of M&V IT system; Stakeholder consultation; Input to international workshop
Outputs	• Draft report • Final report • Technical specifications for a monitoring and verification IT system

Task 5.1 Analysis of best practices

The purpose of this task is to learn from what other EU countries have done in implementing policies similar to those settled upon for Estonia in the optimal pathway. Best practices will be identified based on the synergies of the policies in other MSs with those Estonia is considering pursuing in the optimal pathway, and if possible, published results of the impacts of these policies.

Best practice examples may include:

- **Energy efficiency obligations/White certificate schemes**
  - **France** – Energy suppliers must meet government-mandated targets for energy savings realised through the suppliers' residential and commercial customers.[3]
  - **Italy** - electricity and gas distributors with more than 50,000 clients are obliged to reach increasing annual energy efficiency targets.
  - **Poland** - In 2013, the Polish government introduced an energy efficiency obligation. The obligation covers all sectors, except transport.[4]
- **Buildings policies**
  - **Belgium-Flanders** – Minimum requirements for roof insulation for rented homes.[5]
  - **Denmark** – Energy labels for buildings and One Shop Stops.[6]
  - **Germany** – The Energy Saving Ordinance requires owners to retrofit buildings within s specific timeframe.[7]
  - Other relevant renovation policies and schemes in Nordic and Eastern Europe countries.

Task 5.2 Gap and barrier analysis

Legislative, regulatory, and institutional gaps to implementing the optimal pathway will be specified based on the work performed under deliverable 2 (barrier analysis) as well as work done under deliverables 3 and 4.

[3] https://www.iea.org/policies/1854-white-certificate-scheme-obligation
[4] https://www.iea.org/policies/551-white-certificates
[5] https://www.iea.org/policies/8504-minimum-requirement-for-roof-insulation-in-rental-residential-buildings-flanders
[6] https://ens.dk/en/our-responsibilities/energy-labels-buildings
[7] https://www.bmwk.de/Redaktion/EN/Artikel/Energy/energy-conservation-legislation.html

Detailed recommendations for changes to the legislative and regulatory framework (at least 10 changes described in at least 2 pages each, or equivalent) will be provided, building on the action plan under deliverable 4, covering, for example, aspects linked to the definition of involved parties, eligible measures, target setting, enforcement, etc.

Task 5.3 Analyse existing M&V approach and EE related IT systems

We will analyse the current approach to monitoring and verification (M&V) of the impacts of the optimal pathway with an eye to how well it fits to measuring the results of those policies that comprise the pathway. There are two types of relevant M&V: impact, and process. Impact M&V directly or indirectly measures energy savings and costs resulting from policy implementation. The first principles of M&V of energy efficiency measures are to: estimate baseline energy consumption, then; estimate energy use after measure implementation, then; calculating the difference, accounting for variables such as weather (cooling and heating degree days) and changes in energy prices. Current practices will be documented and compared to best practices, such as those outlined in the International Performance Measurement and Verification Protocol (IMPVP), which specifies four approaches to M&V of energy efficiency projects:

1. Option A: Retrofit isolation – key parameter measurement
2. Option B: Retrofit isolation – all parameter measurement
3. Option C: Whole facility (direct) measurement
4. Option D: Calibrated simulation[8]

Options A and B are the most expensive M&V approaches because they require end-use metering, whereas; Option C is less expensive because only master meter or whole facility energy use data is used, and Option D is mainly used for buildings - it requires use of field data in a calibrated energy simulation model. For renovation grants and for other similar measures with financial support, direct measurement based on actual energy use change is the preferred measurement option. This can be done with before and after creation of renovation energy performance certificates (EPC), which are developed using metered energy data and are weather normalised. It is also important to verify energy savings so that these align with energy statistics data, thus showing the development of whole sectors, including impacts of energy saving measures and general market development.

We will also assess, through desk research and informal consultations with stakeholders the current status of the market to carry out professional M&V services. Many different experts are needed to perform M&V – industrial auditors, building energy engineers, economists (e.g., to perform benefit-cost analysts), among others.

We will also "bench test" current energy efficiency data collection, storage and related IT systems, as these are the backbone of all M&V efforts. The results of the bench test will show how well the current system functions from a user perspective, alignment to M&V needs for policies in the optimal pathway, and any gaps. This information will be used in Task 5.5 to develop the M&V IT system.

Task 5.5 Develop M&V IT system

[8] https://evo-world.org/en/products-services-mainmenu-en/protocols/ipmvp

The concept and technical specifications of an online monitoring and verification IT system that allows for simplified reporting, monitoring and verification of energy saving measures in Estonia will be developed. This system proposal will be based on the analyses of current energy efficiency related IT systems and databases in place in Estonia, described above. We expect that a new dashboard for buildings and industry related saving measures can be built on the top of existing Estonian building registry (EHR), which already includes comprehensive data such as energy performance certificate data. Transport sector measures will need to have another dashboard that should be based on the Transport Administration registry. Energy saving measure implementation data input to this new system can be at least partly automated if buildings and industry (having a street address/registry identifier/connection point) are connected to an IoT platform capable of reading and processing smart energy meter data (practically all electricity, district heat and gas meters in use in Estonia are smart meters) to determine and aggregate actual energy saving for each energy saving measure. For this purpose, an API has to be developed that will link proposed dashboard to EleringAndmeladu[9] Data Hubs for electricity and gas, that are the information systems to where all contracts connected to electricity and gas transmission and also consumption metering data has been brought together. This is in line with MEAC plans to implement real time automated energy performance certificates for buildings in the current EHR. TalTech Digiaudit project[10] is currently developing an IoT platform that collects real time energy data from a connected test sample of 45 buildings and has APIs to Elering electricity and Utilitas district heat data hubs – this preforms automated data processing for energy performance certificate calculations and can perform energy saving calculations. Therefore, we foresee that EHR and transport registry developments in the future could cover most of energy saving measures - the specification will be developed in this task for that purpose. A system developed according to these principles would enable the government to track the outcomes of energy saving measures, and also end energy use developments within entire sectors.
This developed system will be usable for assessing energy savings, which can be reported to the Commission to fulfil energy savings targets.

It was noted during the kick-off meeting that flagship policies should cover all relevant sectors, and include multiple policy types, e.g., energy savings obligations, renovation targets, voluntary agreements, financing, etc.

Task 5.6 Stakeholder interviews

We will conduct at least 10 semi-structured interviews (see further information on the semi-structured approach under deliverable 3) with administrating authorities on the institutional bottlenecks to implementing the optimal pathway, and possible solutions to alleviating the bottlenecks. The information gained will be used in the draft report.

Task 5.7 Draft report

A draft report for deliverable 5 will be submitted to MEAC and DG REFORM for comments (in English). Our proposed report outline is as follows:

- Introduction

[9] Estonian independent eelectricity and gas transmission system operator

[10] https://taltech.ee/en/news/digiaudit-platform-enables-real-time-building-performance-audits

- Energy efficiency policy analysis
    - Best practices
    - Gap and barrier analysis
    - Stakeholder interviews

- M&V system analysis
    - Analysis of existing M&V approach and EE related IT systems
    - Recommended M&V system
- Conclusions

To provide more detail on what will be included in the recommendations, detailed recommendations for the administration of the policy/scheme (at least 30 pages, excluding annexes), including recommendations for the involved institutions, their roles, capacities and setup, as well as relevant operational methodologies will be included. Furthermore, the recommendations for the administration will include detailed recommendations for the approach for monitoring and verification of the policy/scheme, which will be aligned with the requirements for EU legislation. The recommendations for M&V will place particular focus on making use of digital solutions to minimise the administrative burden on the side of the competent authorities as well as the involved parties and other implementing authorities. Lastly, the recommendations will cover the role, administration and regular updating of the catalogue to be developed in parallel in the context of deliverable 6.

Task 5.8 Provide input to international workshop

The project team will provide input and support to the TAIEX workshop as per Request for Service. This may include best practice examples from EU countries, and recommendations regarding public experts who could be contacted for discussions at TAIEX.

Task 5.9 Final workshop

A final workshop will be organised, covering the draft report.

Task 5.10 Final report

Following feedback from MEAC and DG REFORM, final report for deliverable 5 will be submitted (in English).

Task 5.10 Translation services

In our proposal, we provide a fixed budget for translation services (€5000). We will use this budget to translate deliverables 4 and 6 from English to Estonian.

1.5 Deliverable 6: Catalogue of energy saving measures and calculation methodologies

Deliverable 6: Catalogue of energy saving measures and calculation methodologies

Aim	To develop a catalogue of energy saving measures and a scenario calculation table of the aggregate energy savings up to 2050
Tasks	• Identification of potential energy saving measures • Excel based calculation template development for each measure • Scenario calculation table development
Outputs	• Draft catalogue • Final catalogue

The main result of this deliverable will be a catalogue of at least 25 energy saving measures with standardised calculation methodologies and indicators for calculating energy savings in line with Article 7 and Annex V of the EED and adapted to the Estonian context. Furthermore, deliverable 6 will include excel based calculation templates for each catalogued measure as well as a scenario calculation table enabling to apply different implementation rates for measures to calculate the aggregate energy savings up to 2050.

1.5.1 Task 6.1 Identify similar catalogues

At least 3 similar catalogues will be identified starting from the same cold climate zone countries, such as Denmark, Finland and Sweden. It is expected that these catalogues can provide a valuable input to the selection process of EE measures as well as for the calculation methods.

1.5.2 Task 6.2 Identify potential measures for inclusion in catalogue

At least 25 energy saving measures will be identified. For the identification process clear selection criteria will be established, which will enable us to compare the efficiency and extent of measures from different sectors included in the study. The selection criteria will include cost-effectiveness calculated with net present value method for investment lifetime, marginal carbon abatement cost, support needed from the government budget, significance of energy saving and other relevant aspects. Energy savings measures will be selected so that all end use sectors are proportionally covered. Based on the results of the best practice analysis and on the application of developed selection criteria, a draft list of potential measures to be included in the catalogue will be identified. These measures will cover multifamily apartment buildings, single family buildings, central government buildings and other public buildings, school and other educational buildings, commercial buildings, district heating, district cooling, on-site and nearby photovoltaic, heat pumps, as well as transport, service and industry sectors measures.

CO2 reductions associated with measures in the database will be included in the database if MEAC can provide relevant emissions factors to the project team.

1.5.3 Task 6.3 Consult with stakeholders

A draft list of the potential measures will be shared with stakeholders, including DG REFORM, MEAC, and the steering committee, and based on the feedback the final list of measures to be included in the catalogue will be agreed.

1.5.4 Task 6.4 Develop catalogue

The catalogue will be developed for the final agreed list of energy saving measures. We expect to have measures for residential, public and commercial buildings, district heating and district cooling, on-site and nearby renewable energy generation, transportation (public transport and fuel switch to electricity and biogas), phasing out of fossil fuels, heat pumps, industry and street lighting. For each measure this

will include calculation methodology description, including formulas, and clearly identifying the required inputs and data needed to calculate the energy savings. Each catalogued measure will be implemented in an excel based calculation template that automatically calculates the energy savings and indicators based on the required input parameters. The draft catalogue will be shared with potential users of the tools and updated if needed to address the feedback.

1.5.5 Task 6.5 Scenario calculation table

Based on the catalogued measures, an excel calculation table will be developed for MEAC so that it can calculate aggregate energy saving impacts of the measures included in the catalogue. This calculation table will be built on the baseline scenario engine with necessary additions to cover all measures included. Model calculations up to 2050 will be conducted for at least three relevant scenarios where different rates will be applied for the uptake of the measures as agreed with MEAC.

It was noted during the kick-off meeting that:

- The database design should help government comply with Energy Efficiency Directive requirements
- It should be user-friendly so government can continue building the database.
- The database will include energy savings and cost assumptions for individual energy efficiency measures
- The database can be used to identify the measures with the highest energy savings potential, and the most cost-effective measures
- Measure interactive effects will not be calculated in the database

2 Key data needs and assumptions

The below table shows the key sources for data required for this project, and any anticipated gaps or challenges. We will work to overcome the gaps and challenges noted, however, these solutions will only become apparent during conduct of the deliverable.

Table 2-1: Data sources, gaps and challenges

Sector	Key data sources	Gaps or challenges
Macroeconomy	Data on GDP in current and constant prices, data on total energy supply and final consumption from Statistics Estonia, data on heating and cooling degree days from Eurostat.	Present crises and geopolitical impacts have caused high uncertainty for energy supply and final consumption in the future.
Industry	Final energy use in industry including sub sectors of Manufacturing industry and value added by branch from Statistics Estonia.	Present crises and geopolitical impact have caused high uncertainty for many industry sectors.
Transport	Data on stock of vehicles, energy consumption by stock of	Measures applied so far have had small impacts. This

	vehicles and specific fuel consumption of all vehicles from Transport administration database, environmental agency database and Statistics Estonia	provides challenges for scenario development. Present crises and geopolitical impacts result in high uncertainty for transport flows.
Services	Data on energy consumption of services sector, employment and value added by branch and annual construction of tertiary buildings from Energy Statistics. Existing building stock volumes from EHR building registry.	There are no existing measures for commercial buildings in the LTRS that makes scenario calculation challenging
Households	Data on total stock of dwellings (including annual construction) average size of dwelling (including new dwellings) and Households consumption by end-use from Energy Statistics. Existing building stock volumes from EHR building registry.	There are challenges in scenario calculations because the LTRS includes measures but does not include financial commitments

3 Steering group composition

A project steering group will help guide the conduct of this project. The role of the steering group is to provide support, guidance, and oversight of project processes. Members of the steering group should:

- Attend project quarterly progress meetings.
- Attend some regular project check-in calls, as needed. Individual members of the steering group will be invited to specific bi-monthly project check-in calls if their areas of expertise align with content covered during the check-in calls.
- Provide feedback on draft deliverables.

Based on feedback from MEAC, we anticipate the project steering group will be comprised of the below people.

Institution	Department	Name	Email
Ministry of Economic Affairs and Communi-cations	Department of Energy	Tauno Hilimon	tauno.hilimon@mkm.ee
		Irje Möldre	irje.moldre@mkm.ee
		Kristjan Lepp	kristjan.lepp@mkm.ee
	Department of Construction and Housing	Ivo Jaanisoo	ivo.jaanisoo@mkm.ee
	Department of Transport	Indrek Gailan	indrek.gailan@mkm.ee
		Johann Peetre	johann.peetre@mkm.ee

	Development and Investments		
	Department of Economic Development	Sille Kraam	sille.kraam@mkm.ee
		Karlis Goldstein	karlis.goldstein@mkm.ee
	Department of Strategic Planning	Siret Talve	siret.talve@mkm.ee
	Department of Business and Consumer Environment	Ede Teinbas	ede.teinbas@mkm.ee
Ministry of Finance	Department of State Property	Kaie Karniol	kaie.karniol@fin.ee
	State Budget Department	Rando Kängsepp	rando.kangsepp@fin.ee
Statistics Estonia	Department of Economic and Environmental Statistics	Piret Pukk	piret.pukk@stat.ee
Ministry of Environment	Climate Department	Laura Remmelgas	laura.remmelgas@envir.ee
Ministry of Environment	Environmental Management Department	Mihkel Krusberg	Mihkel.Krusberg@Envir.ee
Ministry of Rural Affairs	TBD	TBD	TBD
Transport Administration	Mobility Planning Division	Mari Jüssi	mari.jussi@transpordiamet.ee

4 List of key stakeholders

The key project stakeholders are included in the below table. Stakeholders will be contacted for participation in project workshops.

Stakeholder	Role
Ministry of Economic Affairs and Communications	Main stakeholder of the project
Ministries of: Finance, Environment, Social Affairs, Rural Affairs, Education and Research	Policy making, grants, targets
Consumer Protection and Technical Regulatory Authority	Supervisory authority, technical requirements for renovation

Stakeholder	Role
KredEx	Grants for renovation (with EAS), competence centre for residential buildings
representatives of Local Governments and Association of Estonian Cities and Rural Municipalities (Eesti Linnade Liit)	Buildings owned by Local Governments, Local Governments role and contribution in renovation
Estonian Union of Cooperative Housing (Eesti Korteriühistute Liit)	Consumer side of renovation – problems, cost and possibilities of renovation, best practices
Estonian Business and Innovation Agency	Grants for renovation (with KredEx)
State Shared Service Center	Grants for renovation (public buildings)
Riigi Kinnisvara AS	Manager of state-owned buildings, renovation plan of state owned buildings, competence centre for non-residential buildings
Environmental Investment Centre	Grants for district heating projects, heat management plans, resource efficiency, environmental awareness
Agricultural Registers and Information Board	Rural development and grants (including resource efficiency, solar panels)
Estonian Road Administration	Measures for transportation
Estonian Power and Heat Association	District heating networks (which most inhabitants use in Estonia), heat management plans
Utilitas OÜ	Main district heating producer and provider in Tallinn, possibilities in largest district heating network in Estonia, main developer of district cooling networks
DeltaE Insenerid OÜ	ESCO and other Energy, resource and environmental efficiency solutions for industry and commercial buildings
Estonian Chamber of Commerce and Industry	Largest representative of industries in Estonia – renovation plan for industries
Estonian Association of Electrical Enterprises	Representing companies providing electrical and automation works
Estonian Association of Construction Entrepreneurs	Feedback for building renovation plan, capacity of construction, assessment of assigned targets
AS Estonian Cell	Industry (wood and paper)
AS Enefit Power	Industry (Chemistry and energy)
Nordic Milk (Tere/Farmi)	Industry (Food)
Estonian Central Association of Owners	Representing owners of private households
IVIA	Industrial Park representative (Ida-Viru county)
Tartu Regional Energy Agency	Energy efficiency of industries

5 Indicators to monitor project progress

We will use process and result indicators to track project progress.

1) **Process indicators**
   a) Timely completion of project milestones and deliverables (see project Gannt chart, below).

2) **Result indicators**
   a) Deliverables match the scope of project specifications and request of service.
   b) Feasibility of policy recommendations – recommendations are realistically implementable by government. The feasibility of recommendations. Feasibility will be described in a qualitative manner based on the professional judgment of the project team and feedback from the steering group. For example, "This success of this policy is highly feasible based because it is based on best practices in other EU countries and adapted to the Estonian context. Nonetheless, no policy design is perfect, and the following factors need to be carefully considered in implementation…"
   c) Defensible methodologies used in calculations, e.g., for the share of renewables in heating and cooling. The pros on cons of the methods used to estimate energy efficiency savings and costs will be described. For example, "Engineering calculations were used to estimate measure savings. Assumptions for these calculations were based on the best available data. However, assumptions should be updated with more accurate data (e.g., metered data) in the future when such data becomes available."

We will check-in with the Commission and the beneficiary during quarterly progress meetings on project progress against these indicators. Progress will also be described in quarterly progress reports.

The below Gannt chart reflects a contract start date of 29.9.22 and a project kick-off meeting of 21.10.22. Acceptance by the Commission of the final inception report will signal the end of the inception phase. The project team is already working on D2.

Table 5-1: Project Gannt chart

Deliverable	Month												
	1	2	3	4	5	6	7	8	9	10	11	12	13
	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23
D1. Inception													
Kick-off meeting	*												
Reporting		*											
D2. Data collection and baseline													
Research													
Workshop				*									
Database development													
Baseline scenario													
Draft			*										
Final				*									
D3. EE pathways													
Pathway identification													
1st workshop					*								
Pathway analysis													
2nd workshop							*						
Reporting							*						
D4. Action plan													
Draft plan								*					
Workshop									*				
Final plan										*			
D5. Detailed EE flagship policy concept													
Policy analysis													
M&V analysis													
Stakeholder consultation											*		
Input to intl workshop											*		
Final workshop												*	
Reporting												*	
D6. EE measure catalouge													
Measure identification													
Template development													
Catelouge creation													*
Final report													*

Progress	
Deliverable	*

6 Communication and organisation

We will hold bi-monthly progress meetings between the project team, DG REFORM and MEAC. Steering committee members will be invited to these meetings as needed. Additional project meetings on specific topics will be scheduled ad hoc.

7 Annex: Kick-off meeting minutes

The project kick-off meeting was held on 21 October 2022. The following people were in attendance:

- Angelo Cozzi, DG REFORM
- Tauno Hilimon, MEAC
- Kristjan Lepp, MEAC
- Hannamary Seli, MEAC
- Kristjan Lepp, MEAC
- Irje Möldre, MEAC
- Raiko Puustusmaa, MEAC
- Riina Tamm, TTJA
- Peter Lemoine, Trinomics
- Jarek Kurnitski, Taltech
- Anna Volkova, Taltech
- Inge Roos, Taltech
- Kertu Lepiksaar, Taltech
- Jarek Kurnitski, Taltech
- Martin Thalfeldt, Taltech
- Markus Tamm, Energex
- Rander Süld, Energex
- Robert Uden, Sweco

Following introductions, and a brief discussion on lines of communication, project objectives were discussed. MEAC stated that the main project objectives are the two noted in the Executive Summary, above. Next, we discussed each deliverable. The below table reflects clarifications to the scope that were discussed during the meeting.

Deliverable	Scope clarifications
1	• None
2	• Draft database due in December, which may include some gaps • We anticipate the draft database can be completed, but baseline scenario 2050 preparation may take longer time because of the need to agree on assumptions and on input data used in the scenario calculation. This will cover the inclusion of already decided commitments and assumptions on market-based development trends and other input data for different sectors. • Final D2 to be delivered in January • Previous work done will provide the basis for this deliverable. This work includes: o LTRS Long Term Renovation Strategy o Building stock hourly model o ODDYSSEE-MURE Estonia energy profile o Estonian Energy Roadmap 2021-2031-2040 (Rohetiiger) o Heat pump potential in the Baltic States (Nordic energy research) o H2020 Heron: energy policy and measures in buildings and transport o Scenarios for electricity and heat production and use of transport fuels and impact assessment with LEAP and EcoSenseWeb for the National Energy Development Plan 2020 o National studies: ▪ https://energiatalgud.ee/node/8919?category=1706 ▪ https://www.mkm.ee/ehitus-ja-elamumajandus/analuusid-ja-uuringud ▪ https://www.mkm.ee/energeetika-ja-maavarad/analuusid-ja-uuringud#energiathusus ▪ https://www.mkm.ee/transport-ja-liikuvus/analuusid-ja-uuringud ▪ https://envir.ee/kliima/toetavad-materjalid/kliimavaldkonna-uuringud ▪ Transitioning to a climate-neutral electricity generation (Estonia) ▪ Transitioning to a carbon neutral heating and cooling in Estonia by 2050 o Other studies • Sectors covered result from EED revision article 4 and REGULATION (EC) No 1099/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 October 2008 on energy statistics. o Macroeconomy Sector: ▪ GDP ▪ Energy Balance • Total Energy Consumption

	• Final Energy consumption (including Industry, Transport, Households, Services, Agriculture and Other sectors) ▪ Heating Degree Days o End-use sectors: ▪ Industry ▪ Transport ▪ Services ▪ Households • Baseline scenario definition o The baseline scenario will account for existing policy measures currently implemented WEM (With Existing Measures) – we will assume these measures will continue to 2050, but that no additional policy measures will be implemented
3	• Workshop locations (in-person v. virtual) are to be determined pending the situations at the time of the workshops, e.g., health and safety concerns related to the COVID-19 pandemic. • In-person workshops are preferred • Virtual is acceptable if conditions do not allow for in-person workshops, or if the project team, in conjunction with the beneficiary and the Commission determine there is no value added in holding the workshops in-person.
4	• Government unit working on buildings efficiency already developing plans. Our project team needs to coordinate with the government unit to ensure we are complementing and adding to their work.
5	• Flagship policies should cover all relevant sectors, and include multiple policy types, e.g., energy savings obligations, renovation targets, voluntary agreements, financing, etc.
6	• Make sure the database design will help government comply with Energy Efficiency Directive requirements • Needs to be user-friendly so government can continue building the database. • The database will include energy savings and cost assumptions for individual energy efficiency measures • The database can be used to identify the measures with the highest energy savings potential, and the most cost-effective measures • Measure interactive effects will not be calculated in the database

Trinomics B.V.
Westersingel 34
3014 GS Rotterdam
The Netherlands

T +31 (0) 10 3414 592
www.trinomics.eu

KvK n°: 56028016
VAT n°: NL8519.48.662.B01