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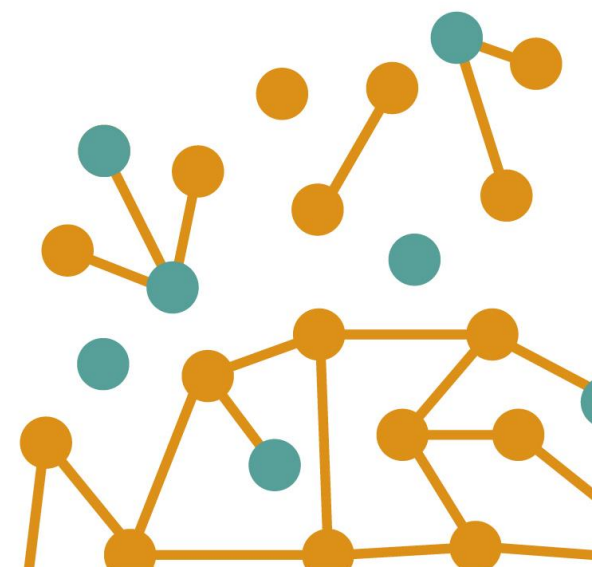
real value of energy efficiency

Short project presentation and overview on the Policy Assessment Tool

ENPOR Seminar 7 September 2023



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000136.



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About REFEREE

REFEREE

Real value of energy efficiency

Horizon 2020 funded project

Project duration: 42 months

1 October 2020 – 30 March 2024

More information on our website:

www.refereetool.eu



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Why REFEREE ?

REFEREE strongly advocates the principle that energy efficiency measures will be key for delivering the [European Green Deal](#).

This project aims to **make energy efficiency more appealing** to policy makers and industrial stakeholders at all levels of governance by

- (1) **delivering insightful and reliable information on the multiple benefits that energy efficiency measures can provide;**
- (2) **offering user-friendly tool to make this information immediately operational for decision makers and industrial stakeholders.**



REFEREE objectives

- (1) Analyse and quantify direct and indirect non-energy impacts of energy efficiency investments.
- (2) Provide easy-to-use tool to
 - a. operationally support decision-makers and industrial stakeholders in evaluating the cost-benefits of their energy efficiency choices.
 - b. And thus increase the cost effectiveness of energy efficiency investments.
- (3) So that facilitate the transition of energy efficiency interventions from “hidden fuel” to “first fuel”.



Main Project Activities



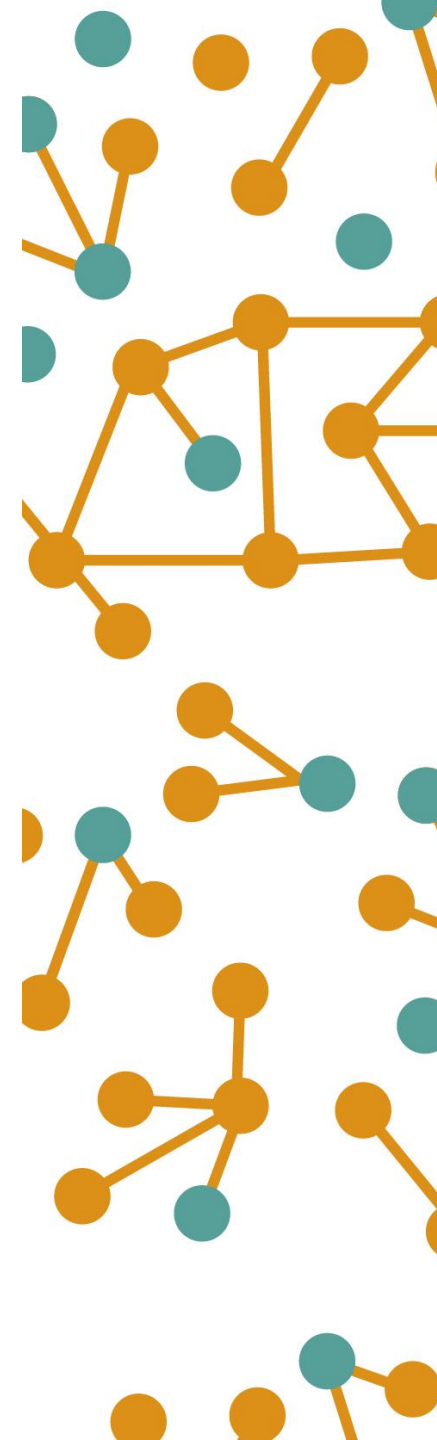
Design and development of an integrated set of analysis tools from the macroeconomic level to the micro level at consumer and firm scale



Stakeholders' involvement and case studies to understand and discuss the user requirements and offer concrete opportunities for co-development



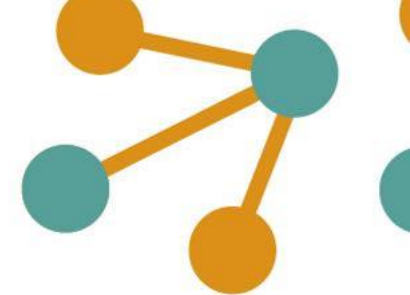
Focused dissemination and communication actions to introduce the tool to the stakeholders' community to which it is addressed



2.

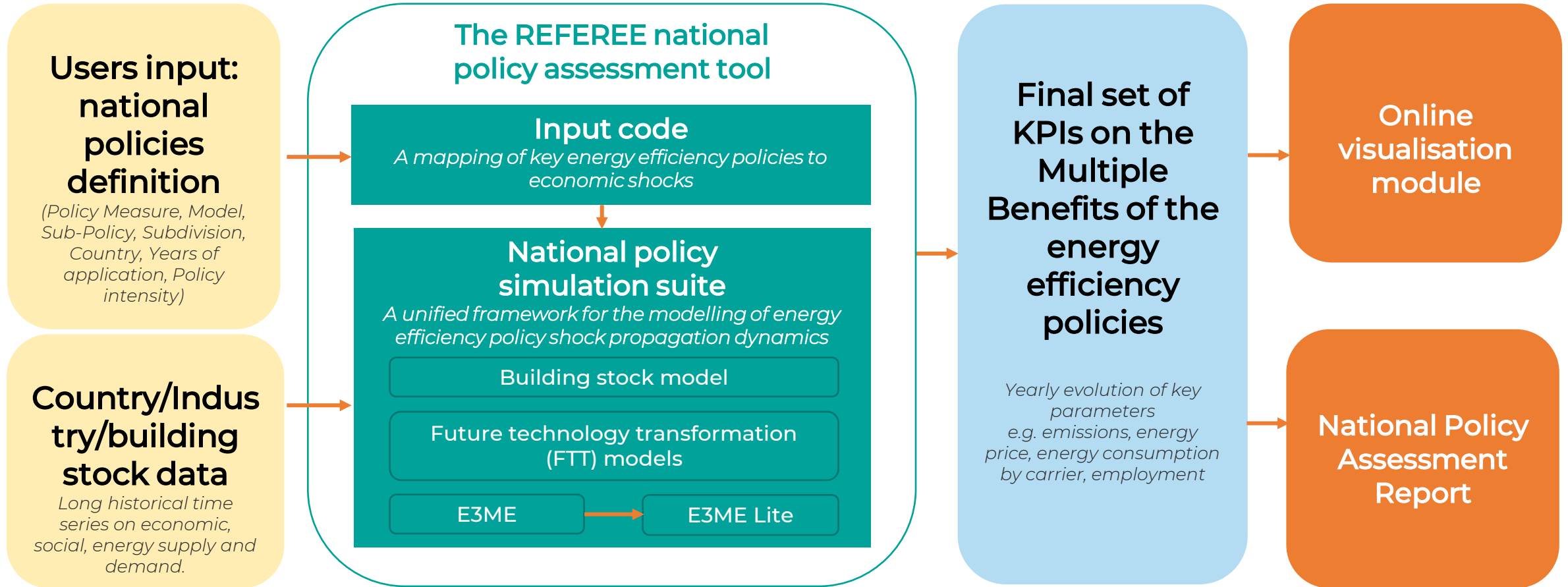
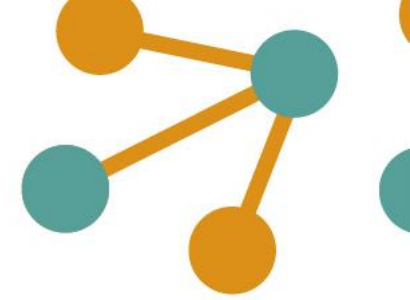
Introduction to the Policy Assessment tool

Overview

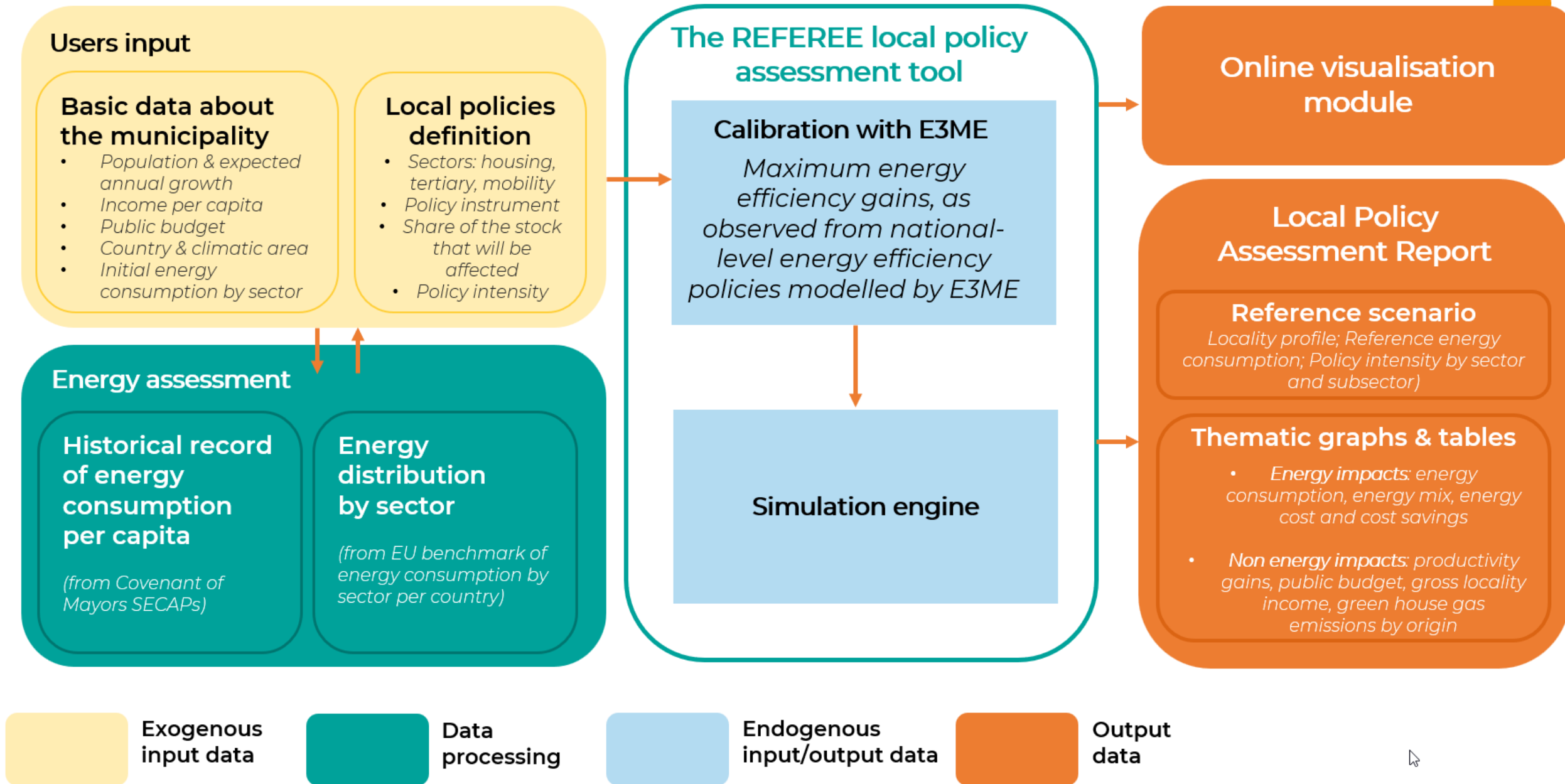


- The REFEREE Policy Assessment Tool quantifies the multiple benefits of energy efficiency measures at **national and local level**
- The **national tool engine models** assess the impacts of energy efficiency policies by modelling changes to building stock, technologies deployed and the macroeconomy:
 - Building stock model
 - Future technology transformation (FTT) models
 - E3ME lite model
- **The national tool** provides scenarios on energy and non energy impacts of energy efficiency measures basing on a **pre-defined set of reference scenarios to be selected by the users.**
- **The local tool** provides energy and non energy impacts of energy efficiency measures at municipal level by calibrating the E3ME lite model outputs at national level and basing on users input data (configuration of municipal reference data).

National policy assessment



Local policy assessment





What can the tool process?

The tool processes the impact of energy efficiency policies packages according to the following **policy instruments** types:

Fuel tax/subsidy

Vehicle tax/subsidy
(biofuel/electric/
hybrid/ICE)

Increase of
renovation rate

Phase out
(Technology, Fuel)

Mandatory change in
the energy mix

Energy efficiency
improvement in
domestic buildings

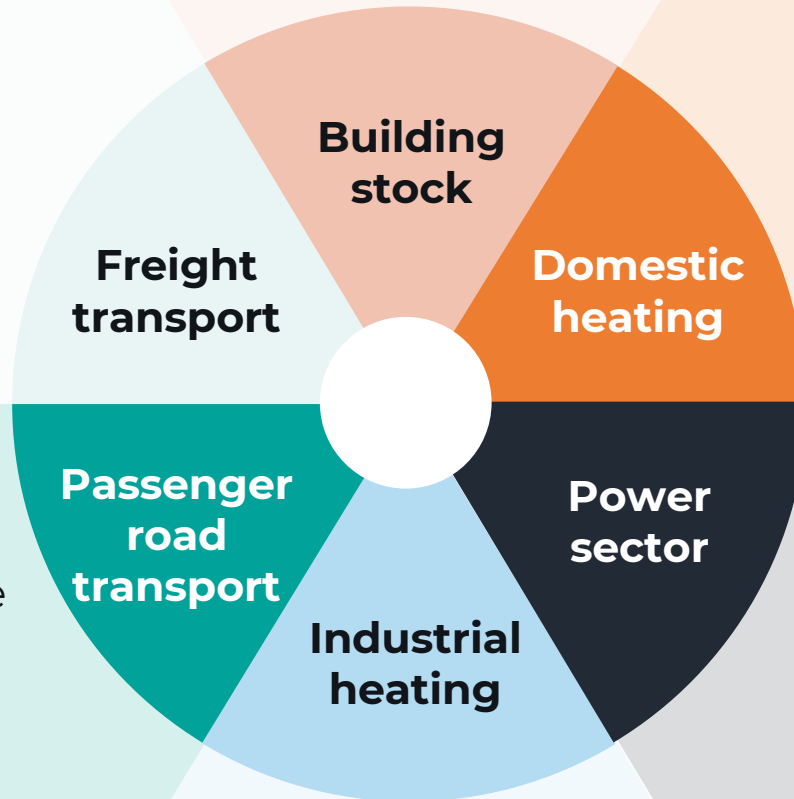


Examples of national policy measures

- Fuel tax or fuel subsidy; Vehicle tax or subsidy
- Phase out of energy carriers relevant to freight transport
- Biofuel, electricity, hybrid gas, hydrogen, oil, vehicles relevant to road freight

- Fuel tax or fuel subsidy; Vehicle tax or subsidy
- Phase out of energy carriers relevant to passenger road transport
- Electricity, hybrid, gas, oil vehicles relevant to passenger road transport

- Increase of the renovation rate

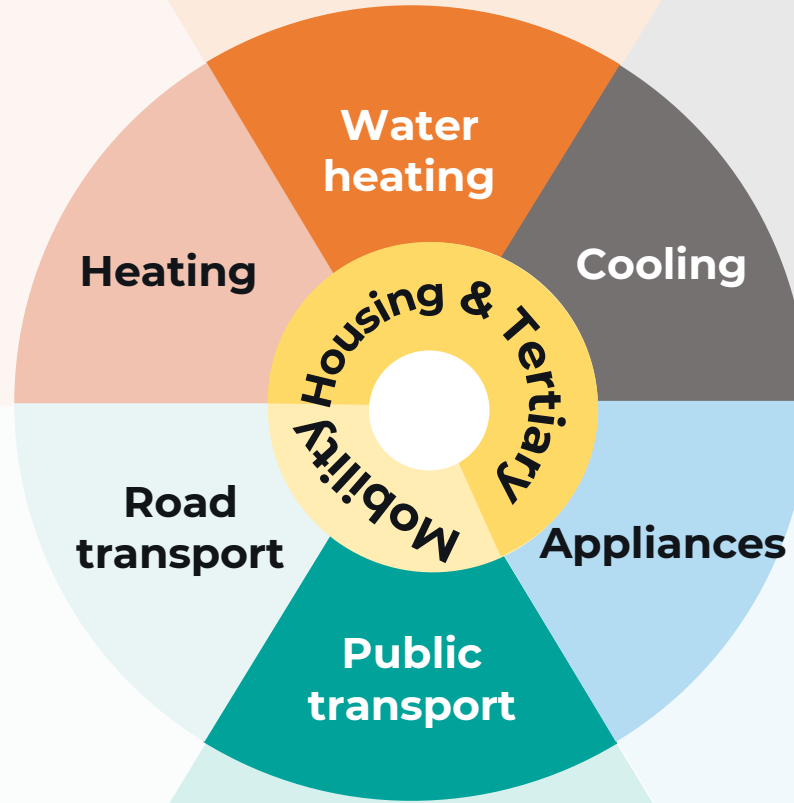


- Fuel tax or fuel subsidy
- Phase out of energy carriers relevant to domestic heating
- Biofuel, coal, electricity, gas, heat, heat pumps, oil

- Fuel tax or fuel subsidy; Mandated change in the energy mix
- Phase out of energy carriers relevant to power sector
- Coal, gas, oil, biofuel, geothermal, hydro, nuclear, offshore/onshore wind, solar

- Fuel tax or fuel subsidy;
- Phase out of energy carriers relevant to industrial heating
- Biofuel, coal

Examples of local policy measures



- Water saving equipment
- Consideration of user behaviour
- Thermal water collectors

- Smart cooling energy management
- Consideration of user behaviour
- More efficient cooling technologies
- Nature-based cooling strategies

- Smart heating energy management
- Consideration of user behaviour
- More efficient heating technologies
- Energy rehabilitation of buildings

- Supporting the renewal of household appliances
- Renewal of building lighting
- Awareness for the rational use of appliances

- Increase mean vehicle occupation
- Reduce travel rate
- Transfer road users to public transport
- Increased vehicle efficiency

- Fleet renovation
- Better fleet management

3.

Main outputs at national and local level

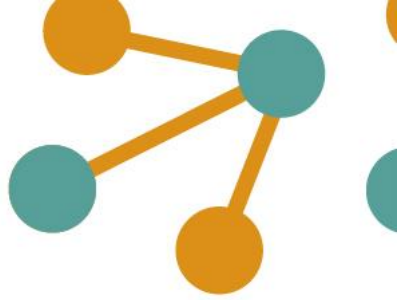
Outputs at national level

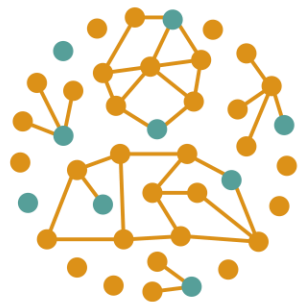
Impact areas	Indicators
Industrial productivity	Gross Value Added (GVA)
	Energy intensity
	Energy cost impact
	International competitiveness
	Labour productivity
Socioeconomic development	Gross Domestic Product (GDP)
	Employment
	Demand for skills by type of occupation
	Demand for skills by skill level
	Public budget as a share of GDP
	Share of energy consumption by quintile
	Share of total space heat demand
Air quality & wellbeing	Air pollution damage costs
Environment & Climate	Air pollution and emissions
	Fossil fuel consumption
	Fuel imports as a share of gross output
	Water used in electricity generation
	Material consumption

Outputs at local level

Impact areas	Indicators
Expected energy consumption and energy savings	Energy consumption and energy savings (total & by sector) <ul style="list-style-type: none"> • Housing: heating, cooling, water heating, appliances • Tertiary: heating, cooling, water heating, appliances • Mobility: public transport, road transport
Cost savings and public finances (pre-tax)	Costs and cost savings (total & by sector) <ul style="list-style-type: none"> • Housing: heating, cooling, water heating, appliances • Tertiary: heating, cooling, water heating, appliances • Mobility: public transport, road transport
	Magnitude of savings contrasted to locality aggregated income (Proxy to municipal GDP)
Climate Change	CO2 emission savings (total & by sector) <ul style="list-style-type: none"> • Housing: heating, cooling, water heating, appliances • Tertiary: heating, cooling, water heating, appliances • Mobility: public transport, road transport
	Contrast with existing policy targets for greenhouse gas emission reduction
Socioeconomic impacts	Increase of available income per capita
	Increase of available local aggregated income
	Municipal public budget impacts
Governance (transformation capacity of public policies)	Impact of public policies derived from citizen behaviour
	Impact of public policies derived from cleaner technology (cleaner energy mix)
	Exogenous gains not deriving from local policies (derived from cleaner electricity mix)

REFEREE partners





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Thank you!

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Municipal profile: additional input for the local policy tool

Municipality profile

- Climatic area
- Income per capita
- Population and population growth
- Municipal public budget

Policies for EE

- Sectors and subsectors are considered, as policy intensity and targeted stock.

Energy profile

- **Total energy consumption** (tool provides for climatic area proxies based on Covenant of Mayors benchmark)
- **Municipal energy consumption abatement by sectors** (tool provides for country-based proxies based on Member States reporting to Eurostat)

Internal parameters (E3ME)

- Historical electricity mix and 2035 projection
- Historical energy costs and 2035 projection
- Housing energy profile by sources
- Tertiary energy profile by sources
- Mobility energy profile by sources

