REGIO1ST

Implementing the Energy Efficiency First Principle in Regional Planning

POLICY BRIEF

October 2025

In a nutshell

Greece has made significant progress in implementing the **Energy Efficiency First (EE1st)** principle, integrating it into national and regional policies, planning, and investment frameworks. The updated **National Energy and Climate Plan** (NECP, 2024) define EE1st as a guiding principle for cost-effective decarbonisation, prioritizing energy demand reduction and efficient resource use before making new supply investments.

At the regional level, the Regio1st project has been instrumental in putting EE1st into practice, especially in Western Macedonia, which is Greece's primary lignite transition area. The region's Just Transition Plan incorporates EE1st as a strategic pillar for local development, connecting economic diversification, job creation, and environmental rehabilitation. Municipalities like Kozani and Eordaia have emerged as leaders by implementing building retrofits, smart district heating solutions, and renewable energy communities—showcasing how efficiency-focused initiatives can enhance competitiveness and promote social inclusion.

Capacity-building activities organised at the Region under Regio1st have highlighted ongoing challenges, such as **limited technical expertise, fragmented governance, and an excessive focus on renewable supply rather than on demand-side measures.**

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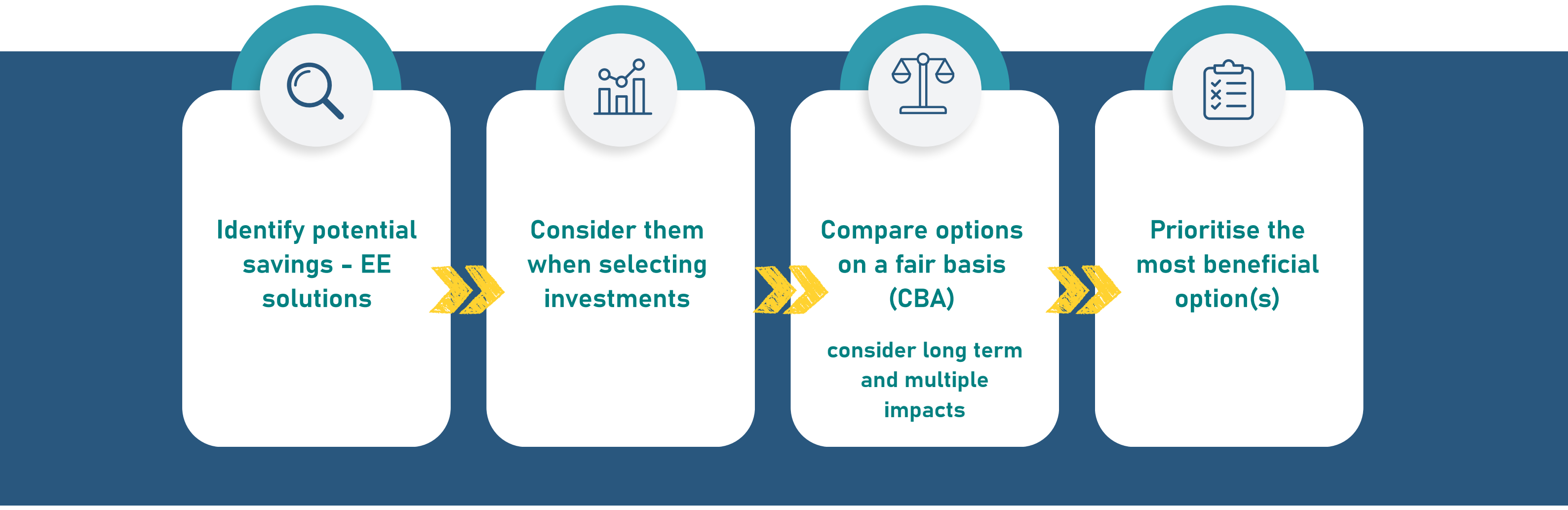
To address these issues, stakeholders stressed the need for practical tools like the Regio1st Framework, harmonised cost-benefit methodologies, and specialised training for regional and municipal authorities.

The implementation of EE1st is further bolstered by a robust mix of EU and national funding instruments. Looking ahead, Greece needs to consolidate these efforts by institutionalising EE1st across all governance levels, enhancing data-driven decision-making, and fostering ongoing multilevel dialogue.

The basics

Energy Efficiency First Principle[1]: Prioritise energy demand reduction through cost-efficient energy efficiency measures in energy planning, policy and investment decisions. In practice, the EE1st principle balances demand and supply options to prioritise the most beneficial energy investments for the concerned community.

This is done by means of cost-effective end-use energy savings, demand response initiatives and more efficient energy supply.



The CBA does not make the decision, it helps in making it, depending on priorities.

EU context and policies

The European EE1st context and implementation is mainly set in the recast Energy Efficiency Directive[2], in particular :

[1] Defined in 2018's Governance Regulation, reinforced in 2023's recast
[2] Directive (EU) 2023/1791 on Energy Efficiency
[3] Directive 2022/869 on guidelines for trans-European energy infrastructure (TEN-E)

- **Article 3 defines EE1st and sets the general frame** and highlights that the principle should be applied wherever it is relevant, including in regional plans;
- **Article 25 requires regional and local authorities to prepare local heating and cooling plans** in municipalities with 50 000+ inhabitants

In the perspective of EU-wide infrastructure development, **TEN-E[3] also requires cost-benefit analysis to integrate EE1st principle** in the planning of regional electricity, gas (incl. hydrogen) and district heating networks.

Greek context

Regulatory framework

The updated Greek NECP (FEK 6983/ 19.12.2024) fully embraces EE1st by emphasising efficient, low-cost investments that aim for:

- Energy transformation in the electricity generation sector, where we aim to increase the share of renewable energy sources in gross electricity consumption to 75.7% by 2030
- Upgrade of the share of renewable energy in final energy consumption in the transport sector by 13.4% for 2030, which reflects a realistic target given the current rate of electrification of transport.
- The development of renewable energy sources specifically for heating and cooling is set at 52.6% for the year 2030.
- The share of RES in final energy consumption in the building sector in 2030 is expected to be 72.2%.
- The exemplary role of the public sector is reinforced by setting a target to reduce the final energy consumption of all public bodies by at least 1.9% per year compared to 2021.
- Municipal plans are constituted to reduce net greenhouse gas emissions to achieve a target of at least 10% for 2025 and 30% for 2030 compared to the base year 2019.
- A target is set to reduce the average primary energy use in residential buildings by 16% by 2030 and by 20-22% by 2035. At the same time, the target for other buildings is redefined, according to which 16% of the worst-performing buildings must be renovated by 2030 and 26% of the worst-performing buildings must be renovated by 2033.

[3] Directive 2022/869 on guidelines for trans-European energy infrastructure (TEN-E)

When planning at a regional level, the following national strategies and plans should be considered:

- National Energy and Climate Plan (NECP);
- Just Development Transition Plan (JDTP), which addresses all issues arising from the strategic decision of the Government to withdraw, by 2028, all lignite plans of the country;
- National Strategy for Sustainable and Fair Growth 2030;
- National Climate Change Strategy;
- National Plan for increasing the number of nearly zero energy buildings; and
- 4th National Energy Efficiency Action Plan

Regional energy planning process

Our work under the Regio1st project focused on Western Macedonia, a Just Transition Priority Area that has been Greece's primary lignite-producing region for decades, where the energy transition requires rapid regional planning to address energy supply, economic restructuring, and environmental recovery. This experience highlighted the coordinated efforts needed at the city level to achieve decarbonization and climate neutrality by 2030. Analytically, the description of the regional planning process is provided in our report on Regional development planning cycles and procedures.

In a nutshell, the planning framework for Western Macedonia's transition includes developing a Regional Just Transition Plan (RJTP) that aligns with Greece's NECP and the EU Just Transition Mechanism.

Local governance structures, such as the Regional Development Fund of Western Macedonia and the Transition Coordination Body (Metavasi S.A.), are responsible for monitoring these plans. The Regio1st project underscored the need for coordinated efforts at the city level to achieve decarbonization and climate neutrality by 2030, since only a collaborative approach ensures that energy efficiency is prioritized in all energy and infrastructure decisions.

How to embed EE1st in regional governance structure and decisions

Regional meetings and mentoring sessions were held throughout the project, mainly targeting personnel from local and regional authorities and the university. From the 13 municipalities of Western Macedonia, two municipalities have stood out. First, the City of Kozani, the capital of Western Macedonia, a Mission City, by aiming to improve energy efficiency across buildings and industries; the city has become a frontrunner in demonstrating how energy efficiency can drive competitiveness, social cohesion, and climate neutrality. Second, the Municipality of Eordaia, a twin city that has decided to implement several measures to reduce energy consumption, including the practical implementation of district-level energy retrofitting for buildings, the promotion of renewable energy communities, and the integration of smart home and EV charging solutions.

The meetings and the capacity activities that took place shed light on several obstacles to EE1st implementation:

- Misinformation: about Climate Neutrality Activities, mainly for the city of Kozani.
- Interpretation of European and national legislation since the national policy focuses on promoting RES first, then on reducing energy consumption, and eventually on energy efficiency solutions.
- There is a need for tools and for connecting EU-level and local funding with community opportunities. There is a need for easy-to-handle tools and methods, like the Regio1st framework, that cities and regions will be able to use for reshaping energy planning, with the aim of reducing the energy consumption and/or promoting response-demand practices.

All in all, multidisciplinary dialogue from regional meetings and other awareness events was facilitated by bringing together energy planners from various sectors to assess efficiency options in an integrated manner. Participants viewed this as an opportunity to foster ongoing dialogue and networking to maintain momentum. Regional stakeholders have noted that previous plans often overlooked critical areas such as regional development, biodiversity, sustainable land use, and climate resilience. They recognised the importance of energy efficiency in promoting economic growth while also protecting the environment.

Consequently, municipalities have re-evaluated their district heating expansion plans, shifting their focus away from a reliance on natural gas and hydrogen. Instead, they are prioritizing building insulation and the development of smart heat networks rather than merely changing fuel sources. Stakeholders emphasised that the EE1st principle should be incorporated into regional development programs, including plans for heating and cooling systems, as well as infrastructure investments. This approach is viewed as a more cost-effective strategy that provides social benefits and aligns with broader strategic goals.

Available support for regions – Policies, Funding and more

To achieve energy efficiency goals, Greece launched a €434 million scheme in 2025 to support energy efficiency upgrades in homes, aimed at reducing consumption by at least 30% and improving energy performance by several efficiency classes. Additionally, under RePowerEU and the National Recovery Plan, it subsidised €223.2 million for solar water heaters and heat pumps, with 50–60% coverage depending on household income and other factors.

Analytically, Table 1 presents the general Greek funding schemes for upgrading energy efficiency in regions.

Table 1: General Greek funding schemes for upgrading energy efficiency in regions

Funding source / programme	Type of support	Main objectives / eligible options	Target beneficiaries	Managing Authority / Key Actors	Budget / Scale
EU Just Transition Fund (JTF)	Grant (EU Cohesion Policy)	Economic diversification of lignite regions; SME & start-up support; land rehabilitation; training & reskilling; energy poverty alleviation	SMEs, start-ups, municipalities, NGOs, regional agencies	Ministry of Development, Just Transition Special Authority (JTSA), Region of Western Macedonia	~€1.63 billion total for Greece (largest share to Western Macedonia)
Public Sector Loan Facility (PSLF) + EIB Loans	Blended finance (EU grant + EIB loan)	Public infrastructure: building renovation, mobility, tourism, cultural and health facilities, energy efficiency	Municipalities, Region of Western Macedonia, public entities	European Commission (DG REGIO), EIB, Region of Western Macedonia	~€80.7 million package (first signed in EU)
Large/ Strategic Green Investment Calls	State aid for major projects	Renewable energy, hydrogen, storage, manufacturing, circular industries, smart agriculture, sustainable tourism	Large enterprises, industrial consortia, public-private partnerships	Hellenic Republic Asset Development Fund / Just Transition Development Programme	Variable; multi-million per project
Just Development Transition Plan (National Pillars)	Policy & funding framework	Five pillars: clean energy, industry & trade, smart agriculture, sustainable tourism, technology & education	Public & private actors in transition areas	Greek Government (Metavasi S.A., JTSA)	Integrated with JTF and national co-funding
ELENA - EIB Climate & Energy Loans (National)	Loan finance	Renewable energy deployment, grid upgrades, energy efficiency, industrial decarbonisation	Public authorities, utilities, private investors	European Investment Bank (EIB), Ministry of Environment & Energy	€2.2 billion national EIB package (2025) – includes €390M for DEPA solar PV parks (Western Macedonia & Thessaly)
Recovery and Resilience Facility (RRF – "Greece 2.0")	EU grants & loans (NextGenEU)	Green transition (energy efficiency, RES, digitalisation), social resilience	Municipalities, enterprises, citizens	Ministry of Finance, Ministry of Energy & Environment	~€31 billion national plan (grants + loans)

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Regional Energy Poverty & Inclusion Programmes	Grants / technical assistance	Energy poverty alleviation, home retrofits, community energy, citizen engagement	Low-income households, energy communities, NGOs	Region of Western Macedonia, JTSA, supported by projects (e.g. JUSTEM, POWERPOOR)	Regional envelope within JTF
ERDF (2021–2027),	Grants / technical assistance	Building renovations, smart grids, street lighting upgrades, district heating improvements			
Exoikonomo" programme	Subsidies	energy-saving renovations in residential and municipal buildings.			.

The regional actors can maximise the impact of the above schemes by:

- **Aggregating demand:** Establishing One-Stop Shops (OSS) and cooperative structures to pool projects and improve access to financing.
- **Blending financial tools**: Combining national grants with loans from HDB, EU Cohesion Funds, or the Social Climate Fund (SCF) to mobilise private investment.
- **Leveraging technical assistance:** Using advisory services provided by national agencies and EU initiatives (ELENA, JASPERS, LIFE-Clean Energy Transition) to develop bankable projects.
- **Integrating policies into regional strategies**: Embedding NECP targets and JTDP opportunities into Regional Operational Programmes, ensuring alignment with EU Green Deal and Fit-for-55 objectives.

All in all, Greek regions have a robust mix of policies, funding, and data support to mobilise EE investments. By effectively combining national initiatives, EU funding, and regional planning tools, local authorities can accelerate energy transition pathways while ensuring social and economic benefits for their communities.

What does EE1st change in the process and discussions?

The EE1st application aims to transform how discussions are conducted at both national and regional levels.

During regional workshops, dialogue about EE1st among diverse stakeholders was facilitated. One of the key discussion topics for achieving climate neutrality was the **transition from a technology-focused planning to a demand-side measures** along with the **need for behavioural changes**. In addition, the Regio1st Framework was introduced as a game-changing methodology for integrating EE1st principle into regional policy design.

Our regional efforts have substantially enhanced the practical implementation of multilevel dialogue; **for the first time, key stakeholders from all concerned governance levels sat together to exchange about energy efficiency**. However, it also highlighted **the challenges Western Macedonia faces, including:**

- insufficient formal structures for dialogue,
- a shortage of local capacity,
- and fragmented responsibilities among ministries and regional stakeholders.

Addressing these barriers is crucial to fully realize the potential of EE1st principles within established multilevel dialogue frameworks and to ensure that energy efficiency becomes an integral part of sustainable development strategies.

What can EE1st change in the analysis / assessment: example of social CBA

Two different types of CBA can be conducted, namely:

Original CBA:

A cost-benefit analysis (CBA) is conducted to measure the benefits of a decision or taking action minus the costs associated with taking that action. CBA includes measurable financial metrics such as revenue or costs due to the decision to pursue a project. In this research, the term economically feasible or not feasible are also used to explain the results of the CBA analysis. The economic impacts are identified, and the evaluation is performed taking into consideration the impacts on the national economy. The analysis is based on changes in the market prices.

Social CBA:

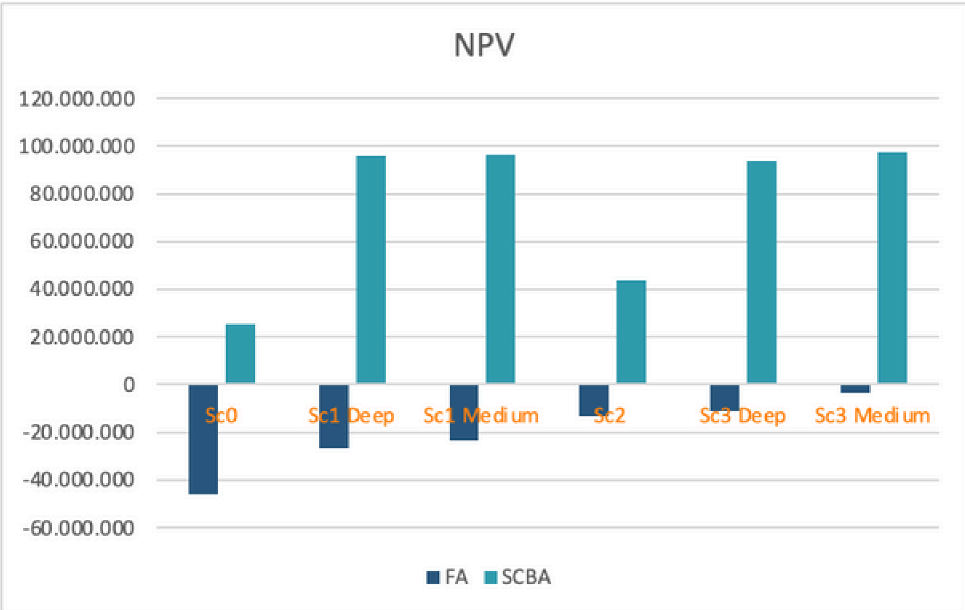
SCBA includes all the factors of CBA analysis. In addition to this, the environmental and social impacts are identified, and the evaluation is performed taking into consideration the impacts on the whole society. The analysis includes both the market prices and the external cost and benefits triggered by the examined investments.

The CBA aims to examine the social profitability of the examined energy efficiency projects, justifying the potential utilization of specific financial schemes (such as subsidies) in relation with the results of the financial analysis. The conduction of the financial analysis and the social CBA leads to the calculation of two different indicators, namely the financial Net Present Value (NPV) (or the financial Internal Rate of Return (IRR)) and the social NPV (or the social IRR respectively). Another considered metric is the Benefit-to-Cost Ratio (B/C Ratio).

Table 2: The results of financial and social NPVs and the decisions to move forward/to stop.

Potential result of calculations	Financial NPV	Social NPV	Conclusions	Next steps
1st	≥ 0	≥ 0	Economically and socially beneficial	Promoting these types of investments/ interventions
2nd	≤ 0	≥ 0	Economically not beneficial. However, socially important	Providing financial supports, e.g., subsidies, increasing municipality's equity share in the investment
3rd	≥ 0	≤ 0	Economically beneficial to invest on a project but not socially.	Penalty for the investors and imposing the incentives that distribute the economic benefits among different groups, such as taxes.
4th	≤ 0	≤ 0	Economically and socially not beneficial.	Stop the investments/interventions

Figure 1: Overview of B/C ratios per scenario in Western Macedonia



In Western Macedonia, Scenario 3 with medium renovation yielded the best results, meaning the highest social NPV. Scenario 3 considers the realisation of nearly-zero energy buildings (NZEBs), meaning refurbishing the building envelope, implementing heat pumps, and installing photovoltaics; Medium renovation means a renovation limited to window frames, doors and walls. This goes in line with the rhetoric that more costly interventions aiming at long-term improvements lead to the highest societal benefit.

Even though Western Macedonia presents no consumption of natural gas, one point in common with regions dependent on natural gas is that the implementation of NZEBs results in lower energy consumptions, higher utilisation of renewables, decreased energy costs, but also more health benefits, as district heating utilising lignite is more polluting. The implementation of heat pumps alone does not provide high benefits due to the low prices of district heating. Investments in natural gas are not beneficial in this case due to lower price of district heating and a low reduction of health harms compared to other fuels (as natural gas presents less harm compared to district heating from lignite but still more than renewables). Even so, this type of short-term cheap policy does indeed reach a high number of households. In fact, since no households present gas boilers, the implementation of the latter has a high outreach and low implementation costs.

What's next?

The integration of Energy Efficiency First principle in Greece requires ongoing alignment among policies and funding opportunities.

The key steps include:

1. **Strengthening policy coherence by including EE1st in regional frameworks.**
2. **Appointing a national coordinator and establishing standardized lifecycle cost assessments.**
3. **Utilising One-Stop Shops (OSS-Coop) to engage citizens and enhance interactions with digital tools.**

Additionally, to effectively implement EE1st, additional measures should be prioritised:

- **Enhancing regional data collection on energy demand and investments.**
- **Training regional and municipal staff in applying EE1st in project planning.**
- **Starting with pilot projects to develop practical guidance for municipalities.**
- **Institutionalizing dialogues to incorporate local insights into national decisions.**

To conclude, the adoption of EE1st in Greece should be a practical, evolving process that scales up through policy alignment and stakeholder engagement to ensure energy efficiency is central to the energy transition.

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Regio1st raises awareness about the Energy Efficiency First principle (EE1st) among regional governments and their agencies and supports them to make related decisions in their planning.

Scan here to visit our Planning Framework:

www.fedarene.org/project/regio1st

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