Accelerating Kozani's Clean Heat Transition with Electro-Thermal Energy Storage

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Executive snapshot

Kozani is at the forefront of one of Greece's most significant energy transitions. For decades, the city's district heating system relied on lignite-fired power plants that are scheduled to be decommissioned by 2028. To maintain affordable and reliable heat while advancing toward climate neutrality, the Municipality of Kozani is exploring an innovative Green Heat Module (GHM): an electro-thermal energy storage system powered by a 12.5 MWp solar photovoltaic park.

Through the City Expert Support Facility (CESF), Kozani received specialised legal, regulatory, and market support to assess how this solution could be implemented within the Greek energy framework. The work examined licensing requirements, ownership options, route-to-market models, financing opportunities, and the practical steps needed to move from concept to deployment.

The resulting analysis provides Kozani with a robust roadmap to replace fossil fuel-based heating with renewable-powered thermal storage, strengthening local energy resilience and creating a model that other cities undergoing industrial transition can adapt.

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Knowledge Report

THE IMPACT

The initiative gives Kozani a credible pathway to decarbonise a critical public service while safeguarding energy security and affordability for residents. By storing solar electricity as heat and integrating it with the district heating network, the proposed system can reduce dependence on fossil fuels and help the city maintain a stable heat supply after lignite phase-out.

Beyond its local benefits, the project positions Kozani as a practical example of how cities in carbon-intensive regions can repurpose existing infrastructure and unlock new clean energy investments. The work also strengthens the city's contribution to the EU Cities Mission by translating climate-neutrality ambitions into an implementable project with clear governance and financing pathways.

THE APPROACH

The CESF support was delivered by Dotsoft S.A. and STRESQ Lab between May and August 2025. Their work was structured around two complementary deliverables.

First, a legal evaluation reviewed the applicable European and Greek regulatory framework, including licensing, procurement, taxation, state-aid considerations, and ownership implications.

Second, a market and ownership analysis assessed how the Green Heat Module could operate under different scenarios, ranging from fully off-grid renewable supply to future market participation. It also examined tariff exposure, financing mechanisms, and Special Purpose Vehicle (SPV) structures involving municipal participation.

Together, these analyses were translated into practical implementation guidance covering governance arrangements, permitting sequences, contractual safeguards, and funding opportunities.

OUTCOMES AND LEARNING

The support delivered three strategic outcomes for the Municipality of Kozani.

- **Regulatory clarity**. The analysis confirmed that the proposed off-grid configuration offers substantial regulatory advantages, potentially reducing licensing complexity and avoiding grid-related charges while remaining aligned with EU and Greek legislation.
- **A governance and ownership model.** The study identified a Special Purpose Vehicle structure as a viable mechanism to combine municipal participation with private-sector expertise and to access funding linked to Greece's Just Transition agenda.
- **An implementation roadmap.** The city received actionable recommendations on permitting, procurement, taxation, contractual arrangements, and funding opportunities, enabling informed decisions on how to move the project toward investment and construction.

Transferable insight:

Cities undergoing industrial transition can accelerate implementation by addressing regulatory compliance, ownership design, and financing strategy at the same time rather than sequentially. For projects involving innovative energy storage technologies, early clarity on governance and market integration reduces risk and improves investor confidence.

What worked:

Combining legal, market, and governance analysis created a comprehensive picture of what is required to implement a first-of-a-kind clean heat project. This integrated approach helped the city understand not only whether the concept is technically viable, but also how to structure it institutionally and financially.

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NEXT STEPS FOR THE CITY

Kozani is now well positioned to advance from feasibility to implementation.

Recommended next steps include:

- Confirming regulatory interpretations with relevant Greek authorities.
- Finalising the preferred ownership and governance structure.
- Launching detailed technical and financial due diligence.
- Securing public and private financing, including Just Transition and EU funding sources.
- Preparing procurement and contractual documentation.
- Moving toward permitting, investment decisions, and eventual deployment.
- These actions will help transform the Green Heat Module from a promising concept into operational infrastructure that supports Kozani's long-term climate-neutrality goals.

WANT TO KNOW MORE?

Learn more about Kozani

Still got questions? Ask us:
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