RES4LIVE
ENERGY SMART LIVESTOCK FARMING
TOWARDS ZERO FOSSIL FUEL CONSUMPTION

Country-specific Policy Recommendations: Greece

The Challenge

Greece is transforming its energy system towards renewables having determined to stop using coal by 2028. During the RES4LIVE project, the pilot farm at the Agricultural University of Athens in Greece implemented an array of renewable energy technologies, including heat pumps, photovoltaic (PV) panels and smart energy control systems. The recommendations made here come from the comments of stakeholders during RES4LIVE's workshops in Greece. The participants – who included farmers and technology developers – discussed the advantages and challenges of renewable energy source technology (RES) installation in Greece, particularly RES showcased in AUA's pilot poultry farm. The recommendations are separated below into three categories: industry/technological, governmental and socio-economic.

Industry/Technological Level

Ease of Installation

Accessibility is key for an uptake in renewable energy solutions in agricultural facilities and is often a defining factor in choosing which RES technologies to install. The farmers in the Greek RES4LIVE workshops, for example, gravitated towards photovoltaic (PV) panels, much more than heat pumps. PV panels represent the most widely adopted RES technology, largely due to supportive regulatory frameworks. For other technologies to become as popular, they require similarly beneficial regulatory support. As the focus in the Greek market should be on upscaling, accessibility is the first step on that path.

Strengthen Greece's grids to give farms and other renewable energy production sites the opportunity to export excess electricity

Greece's many islands are not all connected to the mainland Greece grid. Therefore, obtaining a grid connection in Greece can also be difficult. Furthermore, they can have weak grids (i.e. liable to mismatches in supply and demand). The Cycladic Islands, for example, have traditionally relied on costly oil and natural gas – an EU-funded project beginning in March 2018 has focused on connecting the Cyclades to the mainland Greece grid over the next 14 years. This will certainly prove to have substantial environmental benefits, including for agricultural facilities on islands. The EU's European Regional Development Fund contributed a significant amount to the project (approximately EUR 138.2 million of the total project budget of approximately EUR 389 million). Improving the capacity and reach of the grid is certainly therefore a priority area – and a challenge – but regardless, the grid space should be more

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closely regulated and licensed. Grid connections in Greece are quite loosely regulated, and final grid connection offers (GCOs) to licensed producers have largely been granted on a first come, first served basis without specific priority requirements. Priority areas should certainly be a factor in future GCOs.

The PV system in the AUA pilot farm in RES4LIVE, for example, was not connected to a larger grid in Athens; this is mainly due to the fact that the farm does not produce an excess amount of energy to transfer to the grid but is also due to the fact that a grid connection would be difficult to obtain, requiring significant resources (including installing a storage system such as batteries) and time to obtain the necessary permitting.[1] The surplus electricity can, however, be donated to other campus buildings. In August 2022, following a longstanding unofficial halt in the approvals of new applications for GCOs, the Ministry of Environment and Energy published priority framework for granting GCOs to RES stations – to be conducted through independent competent independent power transmission operator (IPTO). This could be promising – IPTOs could evolve into a "one-stop shop" (as recommended as part of the "acceleration zones" in the Renewable Energy Directive (RED)) for licensing and connections, reducing administrative barriers and regulatory red-tape to the renewables sector – as well as reducing the licensing queue for renewables which had become very long by 2024. Expansion of the grid will be another necessary step in this process as well.

As well as an expanded grid, there is a need for greater interoperability. While livestock farms have less demand for heating in Greece, there is an emerging trend of integrating PV and heat pump technologies, including geothermal heat pumps, and PVT (combined PV-solar thermal panels). This was successfully demonstrated in the project: the heat pump on the farm at AUA is powered by PV. Heat pumps have proven to replace conventional technologies that provide thermal energy for both heating and cooling.[2] Policies to support the combination of renewable energy technologies in ways relevant to livestock farms are therefore needed.

[1] The AUA pilot farm, like the rest of the AUA campus, is connected to the grid. The PV system installed as part of the project is not connected to the grid. The electricity produced by the PV system is used directly by the farm. When the PV production is not enough (or zero), the facility consumes additional grid electricity. On a yearly basis, approximately 85% of the electricity produced is consumed directly by the farm.

[2] Confined livestock farms in Greece have both heating and cooling needs. While winters in Greece are generally mild, several regions (particularly in the northern part of the country) experience low temperatures. Moreover, heating is required for very young animals, even if only for a few hours per day.

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Policy recommendations:

- *Connect islands to Greece's mainland grid to export surplus electricity and import electricity in times of shortage.*
- *Set up IPTOs as "one-stop shops" for licensing and grid connections*
- *Make it administratively as easy to install heat pumps or PVT modules as it is to install PV modules, with equivalently attractive incentives.*
- *Share best practices across Greece through a variety of means, including conferences, outreach campaigns, and news outlets.*
- *Promote the use of different kinds of renewable technologies in farms' energy supply, particularly if they are on weak grids where their choice of technology could have direct impact on grid stability.*

National level

Escalating energy costs leading to higher costs of food and the need to meet other social aims like the protection of the environment and reduced dependence on energy imports make the case for RES incorporation into the agricultural sector clear. However, legislative barriers – including certification and approvals – can hinder RES installation.

Legislative

Government certification of agricultural facilities as using RES could be an effective incentive or marketing tool. If farmers are to invest in RES systems with high up-front costs, labelling their products as "produced with renewable energy" could be marketed in a way that appeals to consumers - even at a higher price. While standardisation and certification is an important regulatory process, it can also act as a burden to farmers, and therefore a hindrance to compliance. Streamlined, efficient certification and approval processes will be crucial to drive adoption.

Funding

Greece's modified recovery and resilience plan allows it to access Recovery and Resilience Facility (RRF) grants and loans worth €35.95 billion, part of which is going to solar energy projects, but the Greek agricultural industry would also certainly benefit from investment in other RES technologies. In any case,

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the RES4LIVE project would advise some of the solar energy projects to be focused on the agricultural sector. Subsidies can help offset the initial cost of installation (including equipment financing), but there are other funding aspects which can increase the uptake of renewables in the Greek agricultural sector. This includes tax exemptions or low-interest loans as well as financing secured on future energy savings.

Policy recommendations:

- *Invest in financing opportunities for the agricultural energy transition – including with grants, tax exemptions and low interest loans.*
- *Utilise EU funding programmes for a wider and more innovative variety of RES technologies – or to develop systems using a combination of different RES technologies.*
- *Give priority licensing in farms/buildings for self-production (instead of cultivated areas).*

Socio-Economic Level

RES4LIVE's Greek workshops revealed that Greek farmers do not know who to turn to for information on RES technologies, funding, and certification procedures. Numerous consultants from the private sector work in the industry but farmers reportedly generally do not trust them as they feel consultants are more profit oriented than results-driven. For this reason, farmers would prefer public servants with familiarity with the agricultural sector to explain their options to them. Due to a distrust of private sector consultants, farmers feel "lost" on how to become more resilient and sustainable. This trust – and in parallel, the receptiveness to renewable energy interventions on farms – varies with the age of agricultural producers. While younger individuals tend to be more open to RES installations, the older farmers tend to be less interested. Many older farmers reportedly hoped that the younger generation would adopt RES technologies, but feel that younger generation has not yet taken up this challenge because of their cost. The steps illustrated above, particularly with regard to funding mechanisms and a toolkit of incentives and reliable consulting services, would assuage those concerns.

Policy recommendations:

- *The dissemination of information to farmers via trusted bodies like farmers' organisations*
- *Train more operators and installers of RES.*
- *Provide high-quality advisory services from a public body or via a farmers' organisation. The advisory services should include resources on RES technologies, assistance with acquiring funding*

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(e.g., subsidy mechanisms available in both national and European level), and advice on obtaining certification, licences, and permits. To provide a proper toolkit of incentives and services, the following steps should be taken:

- *Identify energy-intensive activities and systems: Assess which processes or systems consume the most energy (such as livestock farms) and understand how different management practices affect energy use. This can be achieved through energy audits as well as smart monitoring and control systems.*

- *Recommend renewable energy (RES) or energy-efficient systems: Propose commercial or custom renewable energy systems or energy-efficient solutions that can be integrated into the facility or replace existing conventional systems.*

- *Analyse renewable energy production potential: Evaluate the facility's potential for renewable energy generation and match it with the appropriate renewable energy systems.*

- *Conduct a techno-economic analysis: Carry out a comprehensive analysis of the technical and economic feasibility of the proposed systems.*

- *Facilitate technology sourcing and oversee installation: Provide connections to technology providers, manufacturers, and installers. Supervise the installation and commissioning of the systems to ensure proper setup and operation.*

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