



## Improving the Biogas Supply Management in a local biogas in Kozani

### Project partners



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### Join4CS

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### Pilot project concept

The project addresses efforts to establish a well-structured biogas supply chain that could better address the feedstock needs of biogas plants in the region of Western Macedonia, Greece. The second goal was to better handle the animal manure in order to increase its added value, instead of burning the useful agricultural biomass residues. Biogas use is common all over the regional authority. The pilot project focussed on the Kozani district where Matesion Ltd. has established its biogas plant.

At the beginning of its operation, Matesion used to rely on animal waste from mink breeding farms existing in the area as its main feedstock material. In addition, they accepted different feedstock (fruits, vegetables, animal manure, fat from food processing companies etc.) with strong seasonal character. The diverse feedstock material and the continuous changes in the mixture in the fermenter led to poor biogas production and problems with handling and insertion of this feedstock material.

A radical improvement to the quality and quantity of biogas was possible by adopting a different strategy in supply chain management. The change was a result of the support by the SecureChain project, through the advice provided by the Regional Lead Partner and the international partners involved.



The new strategy shifted to different feedstock material with more stable character throughout the year. Instead of using mink animal manure as a primary feedstock material with problems in seasonality and the quality of material (usually came along with impurities and stones), Matesion now receives clean manure from a poultry farm in its vicinity. In addition, the company established a contract with a vegetable oil refinery that supplies them with vegetable oil waste which is appropriate for biogas production and a good biogas yield. Another important supplier is the food industry that was looking for a way to rid-off the 'end of life' food material; Matesion could provide them with the adequate solution.



### SecureChain Project Partners



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### Partners

Matesion, as the pilot project owner, has planned, developed and operated the pilot biogas plant in the district area of Kozani. Join4Cs is a non-profit company that strives to promote innovation practices in energy and environmental sectors. They supported Matesion Ltd, in their effort to advance their supply chain in order i) to increase efficiency and proper waste management. (ii) to improve the sorting of different green waste fractions, and (iii) to recover a calorific valuable fraction as combustible for industrial heating plants. Furthermore two civil engineers, the company Grigoriadis and Sofologis Ltd., was involved in the collaboration.

### Results

According to the business plan, Matesion Ltd. had to improve the substrate in order to increase the biogas yield. The company had to use specific substrates in a controlled combination in order to eliminate the 'death' period in feedstock supply, as well as to improve the quality of the substrate and its homogenization.

This was achieved through a change of the substrate mix which improved the C:N ratio and allowed to obtain a more homogenized substrate with a standard combination of different feedstock. Following this new procedure, the company manages to keep constant feedstock characteristics and reduce losing time period needed for the homogenization of the new substrate. This is a result of the identification of new feedstock, such as the vegetable oil from an oil refinery, and the expired food waste from the dairy food industry. The new feedstock has very good biogas potential and, most importantly, is available in standard quantities and in regular supplies. The company increased the operational time and significantly reduced the down time between different waste batches, improving the biogas yield and reducing the volume of post-treatment material.

In numbers, the new combination of feedstock improved the biogas yield by approximately 20% and at the same time reduced the down periods by almost 40%. As a consequence, the capacity factor of the biogas unit increased from 5,500 to 7,500 hours/year. The overall energy production was increased reaching the 3,000 GJ/year or 830 MWh/year. This also improved the financial performance of the unit by around 20%.