

# SMART-CHP

## Problem statement

Demonstrate an innovative, small-scale, mobile power production unit, which uses the agricultural residues generated in rural areas.

## Executive summary

The SMART-CHP prototype is a mobile and modular 5kW<sub>el</sub> and 12 KW<sub>th</sub> CHP unit that fits in the size of a container and combines the technologies of gasification and internal combustion engines.

## Technology description

The SMART-CHP unit consists of a gasification reactor combined with an internal combustion engine and adjusted to work on producer gas for electrical power and heat. The unit was built in Thessaloniki and transported to the premises of the two associated beneficiaries. The feedstock was made up of grape, peach and olive kernels that had been collected from the region of Western Macedonia. The unit has operated for more than 3000 hours with a variety of solid waste streams from agro-industry such as grape pomace, olive and peach kernels, almond shells etc. Also, the unit would operate close to the place of feedstock origin, thus minimising transportation and logistic costs.

## Market deployment considerations

Residual biomass can constitute an extra income for farmers based on the current market prices of electricity and heat, while simultaneously contributing to CO<sub>2</sub> emissions reduction and ecological impacts on the environment.

## Environmental considerations

### Technology feedstock

agri-residues, food waste, wood chips

### Type of process

thermal process

### Technology output

biochar, electrical energy, heat

### Scale

Farm

### Technology Readiness Level

6

### Countries

Greece

### Year

2012

### Stakeholder

University

### Technology owner/developer

Aristotle University of Thessaloniki

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