SmartCHP brings together 10 partners, including European industrial companies, universities and innovation experts with a balanced mix of expertise. The project is coordinated by BTG Biomass Technology Group. It started in June 2019 and will run for 48 months.

**Why SmartCHP?**

- **More sustainable biomass**
  SmartCHP uses on fast pyrolysis bio-oil, coming from the conversion of agroforestry residues and organic waste, decreasing the supply of bioenergy for combined heat and power units. All pyrolysis bio-oils comply with the sustainability criteria concerning biodiversity, emissions and low indirect land-use change introduced by the new Renewable Energy Directive.

- **(Even) more renewables**
  Thanks to its flexibility, SmartCHP is ideally suited to use in combination with fluctuating renewables. When the energy provided by wind and sun is unavailable, the SmartCHP system is automatically activated, securing a continuous energy supply from renewables.

- **Less greenhouse gas emissions**
  The use of SmartCHP for heating and electricity can save between 85 and 95% greenhouse gas emissions compared to fossil fuels. This will also be ensured by the innovative flue gas cleaning system that will be developed and integrated into the SmartCHP system.

- **More efficiency**
  SmartCHP uses a modified diesel engine, which has more than 40% electrical efficiency, and has an overall energy efficiency of at least 85%. Due to its extraordinarily high flexibility, it is also possible to rapidly adjust the fuel load and produce more electricity or more heat according to changes in demand.

**Project Partners**

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**www.smartchp.eu**

@SmartCHP2020

SmartCHP project

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**Cogenerating a renewable future.**

Currently, around 80% of cogeneration plants use natural gas and fossil fuels as their primary source. The EU-funded SmartCHP project will develop a novel, flexible small-scale cogeneration unit to produce heat and electricity from sustainable biomass. This will help boost the use of renewables in the electricity and heating & cooling sectors, contributing to the 2030 climate and energy targets.

The SmartCHP system will provide a small-scale solution suitable for hospitals, universities, municipal buildings and countless industrial users that would like to have an efficient alternative to fossil sources.

**Future users of the SmartCHP system**

- Industry
- Service sector (hospitals, universities, public buildings, airports, etc.)
- Islands, remote areas
- District heating

**The application of the SmartCHP technology in Europe can bring new jobs, more renewables and help mitigate climate change.**

**Did you know that…?**

**COGENERATION IS THE MOST EFFICIENT FORM OF POWER GENERATION.**

- Cogeneration – also known as combined heat and power (CHP) – is the simultaneous production of heat and electricity from a single energy source, which leads to high overall efficiency.

**FAST PYROLYSIS TAKES LESS THAN A MINUTE TO TRANSFORM SOLID BIOMASS INTO A LIQUID.**

- Fast pyrolysis has been chosen in SmartCHP because it can transform a wide range of difficult-to-handle biomass – such as sewage sludge, bark andhusks – into bio-oil, which is easy to store and use for bioenergy.

The SmartCHP system will provide a small-scale solution suitable for hospitals, universities, municipal buildings and countless industrial users that would like to have an efficient alternative to fossil sources.

**Non-food biomasses**

Three non-food biomasses will be considered for the SmartCHP system:

- Agricultural residues,
- Forestry residues and
- Organic waste

The biomass will be converted into bio-oil through fast pyrolysis. The fast pyrolysis bio-oil will be fed into a modified diesel engine and, depending on heat demand, into a flue gas boiler. A smart control unit will be connected to the SmartCHP system. This design makes the system fully responsive to changes in heat and power demand, and enables it to adapt to fluctuating renewable sources, like wind and solar.

**From fields...**

**... to buildings...**

**SMARTCHP System**

- The fast pyrolysis bio-oil will be fed into a modified diesel engine and, depending on heat demand, into a flue gas boiler. A smart control unit will be connected to the SmartCHP system.

**Did you know that...?**

"The application of the SmartCHP technology in Europe can bring new jobs, more renewables and help mitigate climate change."