European Commission

GREEN DEAL PROJECTS SUCCESS STORIES

CLEAN ENERGY WORKING GROUP

REVOLUTIONISING RENEWABLE ENERGY SUPPLY

October 2023

Bio-FlexGen project

As both biomass and hydrogen are essential for the energy transition, Bio-FlexGen is focusing on ensuring that it is part of a circular utilisation of biomass and hydrogen is used in the safest possible way.

The project is making a real difference – those working on it are seeing how their input is contributing to a faster energy transition and therefore a better future.

#EUGreenDeal

ABOUT BIO-FLEXGEN

Bio-FlexGen is developing a combined heat and power plant (CHP) with hourly, daily and seasonal flexibility through hydrogen production from biomass. This includes the flexibility to switch from CHP mode in winter to hydrogen production when needed. Biomass also provides firm power and complements renewable sources such as wind and solar energy.

Bio-FlexGen aims to reach 50% electrical efficiency from biomass by the year 2030.

DESCRIPTION OF SUCCESS

The CHP the project is developing will have three unique, patented features: a high-pressure gasifier; a novel combustion chamber that generates temperatures up to 1 400 °Celsius; and a highly efficient, Biomass-fired Top Cycle (BTC) gas turbine technology.

The BTC plant can convert forestry and agriculture waste to electricity at double the efficiency of conventional steam cycle technologies. It achieves this by gasifying biomass with a high-pressure gas turbine process and massive steam injection.

The BTC plant guarantees energy flexibility and a robust system through the production of electricity from renewable biomass or from green hydrogen. In addition, the plant can switch from producing electricity to producing hydrogen when there are long periods of excess electricity.

Research and Innovation

HIGHLIGHTS

- **Developing cutting-edge BTC plant technology** for energy independence.
- **Applying patented technologies** in gasification, combustion, and gas turbine technology.
- **Producing green hydrogen** or renewable electricity from biomass.
- **Capturing biogenic carbon dioxide** when producing green hydrogen from biomass.
- **Producing two to three times more electricity** when generating electricity from biomass

IMPACT

Bio-FlexGen will revolutionise renewable energy supply in the EU and beyond.

The Bio-FlexGen engineers are successfully testing core technologies in combustion and gasification rigs in Stockholm and Berlin. The first BTC power plant is targeted to be ready in 2030

Read more about this success story online
Revolutionising renewable energy supply

Visit the project website
Bio-FlexGen

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