

COGENERATION

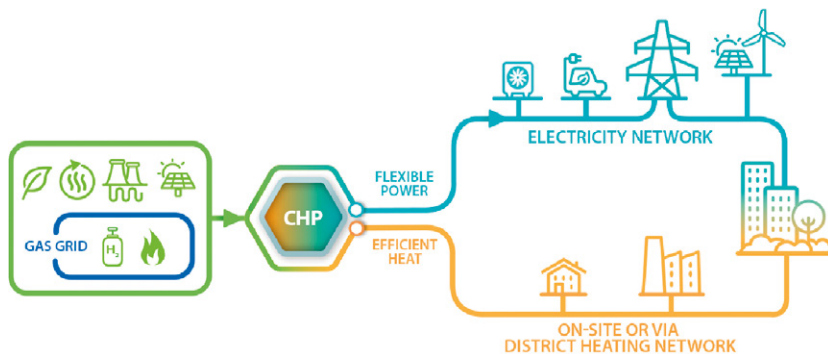
Solutions for the decarbonisation of the pulp and paper industry

The pulp and paper sector is committed to achieving climate neutrality in Europe by 2050. This requires reducing emissions in our production processes by the implementation of energy-efficient technologies and the effective use of fossil-free energy sources.

Cepi's Energy Efficiency Solutions Forum (EESF) aims to accelerate the development and implementation of carbon-reducing technologies and solutions in our sector. We accomplish this by forging new partnerships and

collaborating with developers and suppliers of energy efficiency technologies, as well as providers of fossil-free energy.

Combined heat and power (CHP/cogeneration) uses one fuel source to efficiently produce both heat and power. As our energy systems move towards the integration of renewable and clean energy sources, cogeneration will remain vital in delivering energy efficiency, resiliency and flexibility, in synergy with other clean energy solutions.



*CHP enables the **integration of the energy system** by efficiently linking electricity, heat and gas at local level and **providing energy when and where needed.***

Today, cogeneration is widely used across pulp and paper industrial processes as the most efficient way to generate both heat and electricity from a variety of fuels. With cogeneration, a pulp and paper site can produce its own efficient and reliable energy to reduce energy costs, ensure continuity of heat supply and become more grid independent.

In the future, the role of cogeneration will remain important but will evolve to adapt to the changing needs of the energy system and consumers alike.

1. Maximising the use of renewable sources

Cogeneration can increasingly run on a range of renewable energy sources, including renewable gases, hydrogen,

biomass, as well as geothermal, waste heat, solar thermal bioliquids or even nuclear. Using these valuable energy sources with CHP ensures the efficient production of dispatchable electricity and renewable heat. This is a win-win for the industrial users and the energy system as a whole, as well as meeting our energy and climate targets.

2. Hybridisation and on-site systems' integration

Cogeneration is a reliable technology to use in combination with process electrification solutions.

"Hybrid" CHP and heat pump products take advantage of low-cost renewable power, while preserving continuity of heat and power supply at times of insufficient intermittent

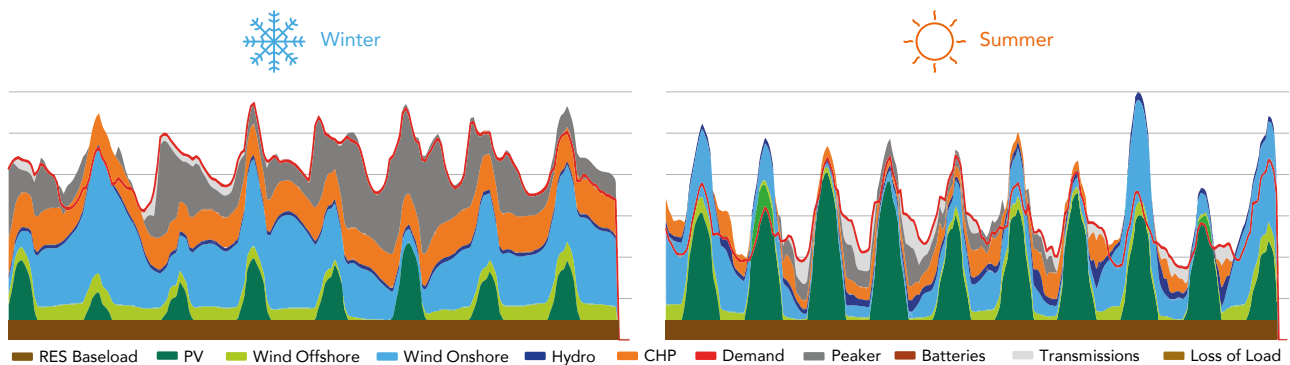
renewable energy. Industrial sites can smartly combine CHP with electrification solutions and carbon neutral fuels in order to significantly reduce their overall energy costs.

3. Flexibility and system balancing opportunities

Cogeneration solutions are dispatchable as they can ramp up and down in response to a customer's needs and increasingly in reaction to electricity markets' signals. As the energy system

moves to higher shares of intermittent renewables (PV and wind) and higher electrification, the optimised use of CHP can significantly contribute to cover residual demand (i.e. demand that cannot be supplied by solar or wind power). An industrial CHP can be designed and operated to unlock new revenue streams by providing a range of balancing and ancillary services to the grid.

How CHP can help balance an electricity system in a net-zero emissions 2050 scenario



CHPs (orange) run as base load during low wind and sun periods, covering a high share of the peak demand.

CHP stops producing when variable renewable generation is sufficient to cover demand, and covers evening peaks.

Source: [Artelys, 2020](#)

Cogeneration as the backbone of local and integrated energy

