

May 2018

THE ROAD AHEAD

When 195 countries adopted the first legally binding global climate deal with the Paris Agreement, defining the ambitious commitment of keeping global warming well below 2°C, it signalled the world's recognition of the real impact of excessive greenhouse gas emissions and the urgent need for action. Clearly, the energy market is changing as part of a necessary evolution to ensuring a sustainable society. Our industry must not only adapt to these changes but must also play a role as a key enabler and driver of decarbonisation.

- ✦ Global engagement to fight climate change is reflected in ambitious EU targets for 2050, which could become even more ambitious in the future. These developments will drive the deployment of more renewable energy sources (RES), which will likely result in the installation of more generation capacity than the energy system requires. In this scenario, a high share of variable RES will mean that thermal power plants will stay idle for most of the year.
- ✦ Europe has the capacity to be a leader in carbon management and ensuring that all future fuel usage is carbon neutral.
- ✦ To achieve carbon neutral fuel usage and to decarbonise other sectors such as transport, heating and cooling, large quantities of renewable fuels will have to be generated from carbon free electricity.

With support and innovation, carbon intensive sectors will decarbonise by 2050. A diverse portfolio of technological solutions is required to reach our collective goal of a carbon neutral and sustainable society for all European citizens.

OUR MISSION

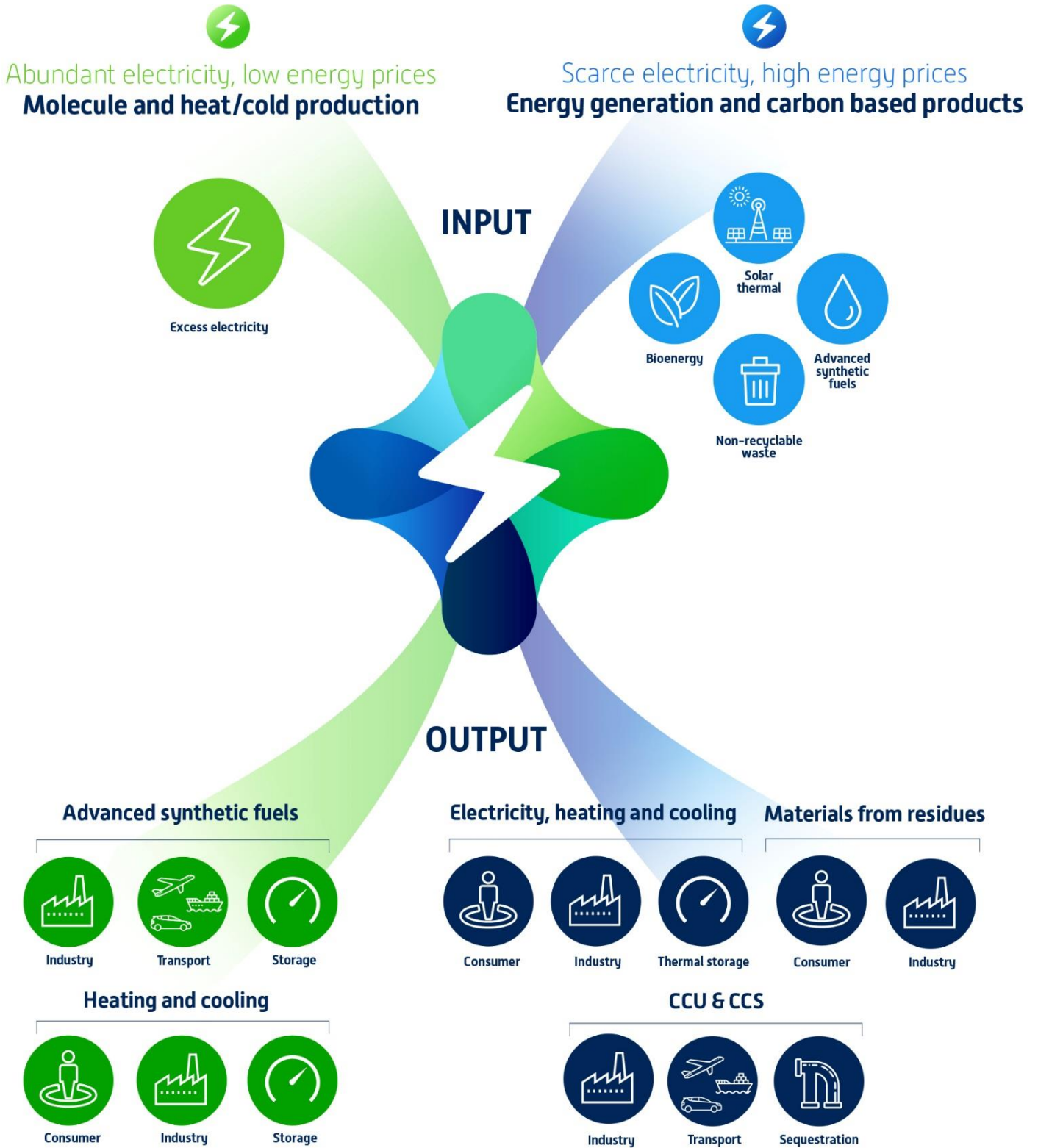
Provide innovative and marketable energy technologies for sustainable, reliable, and affordable energy systems

OUR VISION

Leading the transition to a carbon neutral Europe with cutting edge technologies

Energy Technologies Europe commits itself to provide and further develop technologies, allowing for European energy conversion to be carbon neutral well before 2050. We will accelerate the achievement of the EU's decarbonisation goals by enabling other sectors such as industry, transport, heating and cooling to reach zero emissions.

The Energy Hub



HOW ENERGY HUBS ENABLE THE ENERGY TRANSITION

Bringing together thermal energy and energy conversion technologies to create Energy Hubs is a viable solution to facilitate the decarbonisation of our energy system.

THE ENERGY HUB

Where the production, conversion, storage and consumption of different energy carriers take place.



Abundant electricity,
low energy prices
**Molecule and heat/
cold production**

Energy Hubs are designed to stabilise an energy system with an ever increasing share of variable renewable energy sources. At times of electricity abundance and low energy prices, Energy Hubs soak up excess electricity from the grid, converting renewable electricity into heat, cold and advanced synthetic fuels.



Scarce electricity,
high energy prices
**Energy generation
and carbon based
products**

At times of scarce electricity and high energy prices, Energy Hubs perform their back up role by generating electricity, heat and cold from a multitude of sources (e.g. solar thermal, bioenergy, advanced synthetic fuels). Carbon Capture Utilisation and Storage (CCUS) may allow some processes to go carbon negative or, in other cases, allows for carbon looping, feeding into the production of advanced synthetic fuels.

Energy Hubs can either be large and centralised or small and decentralised, depending on the demand and capability of energy grids. They will periodically generate electricity, heat and cold, thereby stabilising the grid, while continuously ensuring that the heating and cooling sector is decarbonised.










Since the periods when renewable fuel are combusted will be limited to times of scarce electricity, the resource utilisation will also be limited, reducing the need for virgin biomass.

In particular, its input and output mix allows the Energy Hub of the future to be a key flexibility mechanism.

Energy Hubs contribute to a clean European energy system, competitive industry, job creation and maintenance, technological excellence and exportable technologies.

To achieve a carbon neutral energy system before 2050, Energy Hubs should start to be rolled out by 2030 and therefore the concepts must be demonstrated on an industrial scale in the next decade.

The deployment of Energy Hubs will play a key role in reaching carbon neutrality well before 2050 by:

-  Offsetting the use of fossil fuels
-  Balancing the grid when required
-  Facilitating the conversion of excess electricity from renewables
-  Allowing for input flexibility
-  Providing energy storage to match supply and demand
-  Utilising synergies with existing assets (for example, combined cycle power plants and gas infrastructure)
-  Producing the necessary quantities of synthetic fuels
-  Being a catalyst for sector integration
-  Acting as a central tool for carbon management