Overview

Nuclear and SDG13: Climate Action

Industry's commitment to Climate Action

Of all the 17 Sustainable Development Goals, "Take Urgent Action to Combat Climate Change and its Impacts" (SDG 13) is arguably the most important. It addresses directly the existential threat to the human species which the world's changing climate now poses.

It is also the one to which the nuclear energy industry can make the biggest and fastest contribution. The need for very rapid decarbonisation of energy and the complete replacement of fossil fuels is now widely acknowledged. But progress towards these critically important aims remains dangerously slow.

Policy makers continue to ignore the lessons of history. In the past, only two countries, Sweden and France, have ever achieved the scale and speed of decarbonisation which every country must now implement. Both did so by massive investment in nuclear energy capacity.

Nuclear energy is the world's second largest source of low carbon electricity (and the largest within the EU). A recent EU report concluded that Gen III nuclear plants have lower accident fatality rates than any other electricity generation technology. It also found that its lifecycle emissions are comparable to hydro and wind power and that its land requirements are far less than solar or wind.

Technical improvements, including progress on advanced and small modular reactors, are cutting the cost of new nuclear plants. The only barrier to nuclear power increasing its global role is the reluctance of some policy makers to treat it equally with other low carbon energy sources.

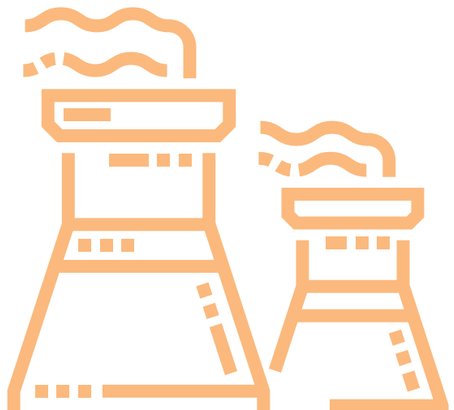
The industry's commitment to helping deliver SDG 13 is unequivocal. 2021 must be the year when governments recognise this. COP26 would be a good place to confirm that they do.

Climate-resilient nuclear power plants

The increasing rate and severity of natural disasters, a consequence of climate change, has had disruptive effects on energy grids. Economies around the world have identified investing in a modern and resilient energy grid as a key priority moving forward. Nuclear energy can play a key role in creating resilient energy systems.

Recent natural disasters have shown nuclear power's resiliency. In 2017, the United States was hit with back-to-back hurricanes. Hurricane Harvey and Hurricane Irma both caused devastating infrastructure damage to South Texas and Florida that left individuals and disaster relief operations without power for days. Fossil fuel plants shut down operations due to flooding, yet nuclear power plants like the South Texas Project, Waterford, and River Bend were able to keep providing gigawatts of reliable energy to the grid. This is because of the strong structures nuclear reactors have that can withstand flooding and strong winds.

Nuclear capacity factors are at an all time high and advanced nuclear energy is expected to build on this trend of continuously improving performance. Advanced reactors will have the ability to restore part of an energy grid independently, or blackstart, in the event of a grid blackout, eliminating the need for fossil fuel blackstart resources. Siting for these reactors may also be below-ground, further shielding plant systems from physical attacks or extreme weather events such as wildfires. Ultimately, having a resilient and secure energy grid matters, which is why investment in advanced nuclear energy is necessary for both existing and new commercial nuclear programs.



YES TO NUCLEAR PERSPECTIVES I SUSTAINABLE DEVELOPMENT GOALS PERSPECTIVE

Faster decarbonisation with nuclear energy

Decarbonising the energy system is crucial for a more sustainable future for all. What is unique about nuclear power is that it can provide electricity 24/7, and its pre-planned maintenance periods do not cause any intermittency in energy supply. Renewable energy does not always follow similar production patterns and thus grid reliability is improved when renewables are coupled with nuclear power.

Today, nuclear power plants worldwide represent almost half of all decarbonised electricity generation, despite providing only 10% of the world's electricity. Even a small increase in nuclear energy's market share can provide significant assistance to decarbonising electricity generation. In addition, non-electric nuclear applications can accelerate such decarbonisation even further. For example, the production of hydrogen through nuclear energy can be a key factor in overall system decarbonization for many energy-intensive markets.

Nuclear power provides reliable and dispatchable energy by generating electricity at a large scale, usable in residential and industrial areas as well as transport, hydrogen production, and many other sectors. Nuclear energy, alongside other renewable energy technologies and combined with appropriate energy storage solutions, can guarantee a rapid transition towards a decarbonised energy pathway for all.

Production of synthetic fuels

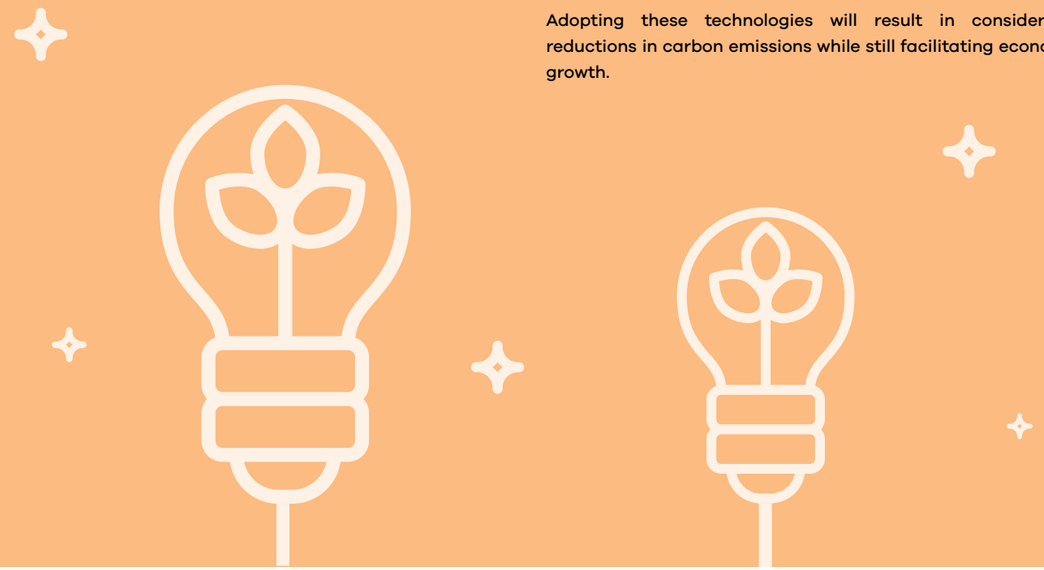
Nuclear power has long been associated with the production of electricity; this being achieved through the heating of water to create steam that drives a turbine. Traditionally, this electricity is exported to, and distributed by, a regional or national grid of heavy electrical cables. In colder regions, any surplus heat from the nuclear power station has often been used to supply district heating.

With the development of advanced reactor designs, additional focus is now being given to other ways to use the electricity generated and how best to utilise the heat.

Some industries require large quantities of heat to function, including cement production, some food production, and desalination of seawater. With modular construction and the portability of many reactor designs, deployment of nuclear power to remote locations can facilitate economic growth in isolated regions and small islands, replacing the need for fossil fuel-burning power stations.

Nuclear power can also produce synthetic fuels. Hydrogen can be produced electrolytically. This zero-carbon hydrogen can be used as a replacement for coke in steelmaking and other metallurgical processes. Hydrogen fuel cells can power vehicles, and ocean vessels can use hydrogen as a replacement for marine fuel oil, either directly or following conversion to ammonia or methanol. Such fuels, when produced using nuclear power, result in near zero emissions.

Adopting these technologies will result in considerable reductions in carbon emissions while still facilitating economic growth.



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