

# Five Top Energy Trends GE is Watching for 2022 and Beyond



## Increased global investment in decarbonization technologies, including CCUS and hydrogen to transition natural gas to a low-carbon energy source

- Over the past decade, we've seen globally the positive impact of transitioning coal-fired power plants to gas power plants. In the U.S., this process played a significant role in the 33 percent decrease in emissions since 2007.
- Coal-to-gas switching represents a fast and effective win for emissions reduction and active GE projects in this area can be found in the [U.S.](#), [China](#), and [Europe](#).
- GE is actively investing in breakthrough technologies that reduce gas emissions even further, through the use of hydrogen or CCUS.
- In the U.S., GE is partnering with the [Long Ridge](#) Energy Terminal, to develop the first purpose-built, hydrogen-burning power plant in America, in addition to pilot projects with [NPYA](#) and [Cricket Valley Energy Center](#) in New York.
- Similar hydrogen powered projects are also underway in [Europe](#), [China](#), and [Australia](#).
- GE is working with partners to advance the cost-effectiveness, performance, and adoption of CCUS solutions for flexible gas plants through innovative design and integration approaches by developing multiple FEED studies and commercial projects, including with the U.S. Department of Energy.



## Dramatic increase in investment and research into accessible Sustainable Aviation Fuel (SAF)

- SAF is an alternative for fossil-based jet fuel. It has the potential to reduce fuel lifecycle carbon emissions by up to 80 percent and could be key to helping the aviation industry meet its [net zero carbon goals](#) by 2050.
- Recently the [FAA awarded](#) more than \$1.4 million in grants to universities to build SAF supply chains across the U.S.
  - The Biden Administration has proposed the SAF Grand Challenge to scale up the production of SAF to three billion gallons per year by 2030 and 35 billion gallons per year by 2050 through incentives such as the GE-supported Blenders Tax Credit for SAF producers.
- GE has been actively involved in assessing and qualifying SAF since 2007 and has recently initiated collaborations with [United Airlines](#), [Emirates](#), and [Etihad Airways](#) on test flights and research programs to increase the use of SAF in today's flights.



## A more modernized, resilient grid to meet demand, severe weather challenges

- More than a third of Americans have experienced a severe weather event this year, highlighting the importance of a more modernized, resilient grid. However, [70 percent](#) of America's transformer fleet is 25 years or older and 15 percent is older than the average life expectancy of a transformer.
- GE Research and Prolec GE, working with the Mississippi power company Cooperative Energy, launched a demonstration of the [world's first large flexible transformer](#), a one size fits all solution that utilities can use off the shelf as opposed to ordering bespoke models with narrow capabilities that take months longer to replace.
- With [\\$73 billion](#) included in the recent infrastructure bill for grid modernization, GE expects to see even more work in projects like this one in 2022.
- The growing utilization of data analytics and artificial intelligence will be used by utilities to create a complete view of the electric grid in 2022 and beyond. [Network Digital Twins](#) from GE Digital will play a critical role in enhancing the reliability and resiliency of our planet's electric grid, allowing companies to run system-wide digital simulations, such as emergency operations during extreme weather events, as well as outage risk prediction based on the vulnerabilities of power generation assets to certain volatile weather conditions or cyber situations.



## Continued focus on offshore wind in the U.S.

- Offshore wind is growing around the globe and we are seeing progress in multiple countries, including on what will be the largest offshore wind farm in the world, Dogger Bank, which will be powered by [GE's HaliadeX turbines](#).
- The Biden administration is taking steps to accelerate the growth of offshore wind by approving the permitting for two planned offshore wind facilities and is committing to generate 30 GW of power from offshore wind by 2030.
- Already the number one provider of onshore wind turbines in the U.S., GE is expected to play a large role in U.S. offshore development and is already slated to deliver HaliadeX turbines for the first commercial offshore U.S. windfarm, [Vineyard Wind](#).
- To help ensure the future success of offshore wind as a source of power, GE Research has projects with the U.S. Department of Energy (DOE) and ARPA-E to scale up and expand this energy source even further. For example, the DOE and GE researchers are leveraging 40 years of IP in superconducting magnets to develop a [generator](#) that enables the world's largest and highest power density offshore turbine.



## Next generation advances in nuclear energy technology

- Nuclear energy is essential to [achieve](#) the net zero carbon emission goals of the Paris Agreement and the [2030 Sustainable Development Goals](#).
- Recently [GE Hitachi Nuclear Energy \(GEH\)](#) was selected by Ontario Power Generation in Canada as the technology partner for the construction of a new reactor in Darlington, utilizing GEH's BWRX-300 small modular reactor (SMR) technology that could be complete as [early as 2028](#). [Polish companies](#) Sythnos Green Energy and PKN Orlen announced days later that they will work together to deploy SMRs, including the BWRX-300 in Poland.
  - Unlike traditional nuclear reactors, [small modular reactors](#), or SMRs, can be deployed faster and at a lower cost per unit of output, making them more flexible solutions to countries seeking zero carbon energy sources. This momentum demonstrates nuclear will take on an increased focus in 2022.