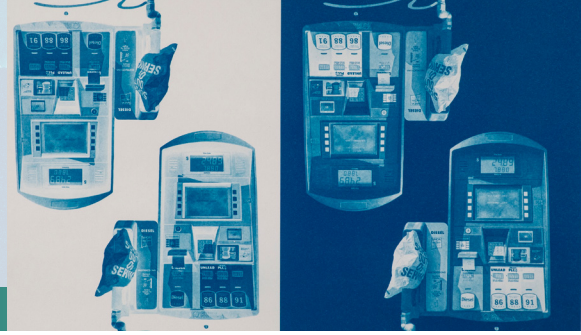
# Energy Supply, Delivery, and Demand



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## Key Message 5.1

### Climate Change Threatens Energy Systems

Energy supply and delivery are at risk from climate-driven changes, which are also shifting demand (*virtually certain, very high confidence*). Climate change threats, including increases in extreme precipitation, extreme temperatures, sea level rise, and more intense storms, droughts, and wildfires, are damaging infrastructure and operations and affecting human lives and livelihoods (*virtually certain, very high confidence*). Impacts will vary over time and location (*virtually certain, very high confidence*). Without mitigation and adaptation, projected increases in the frequency, intensity, duration, and variability of extreme events will amplify effects on energy systems (*virtually certain, very high confidence*).

## Key Message 5.2

### Compounding Factors Affect Energy-System and Community Vulnerabilities

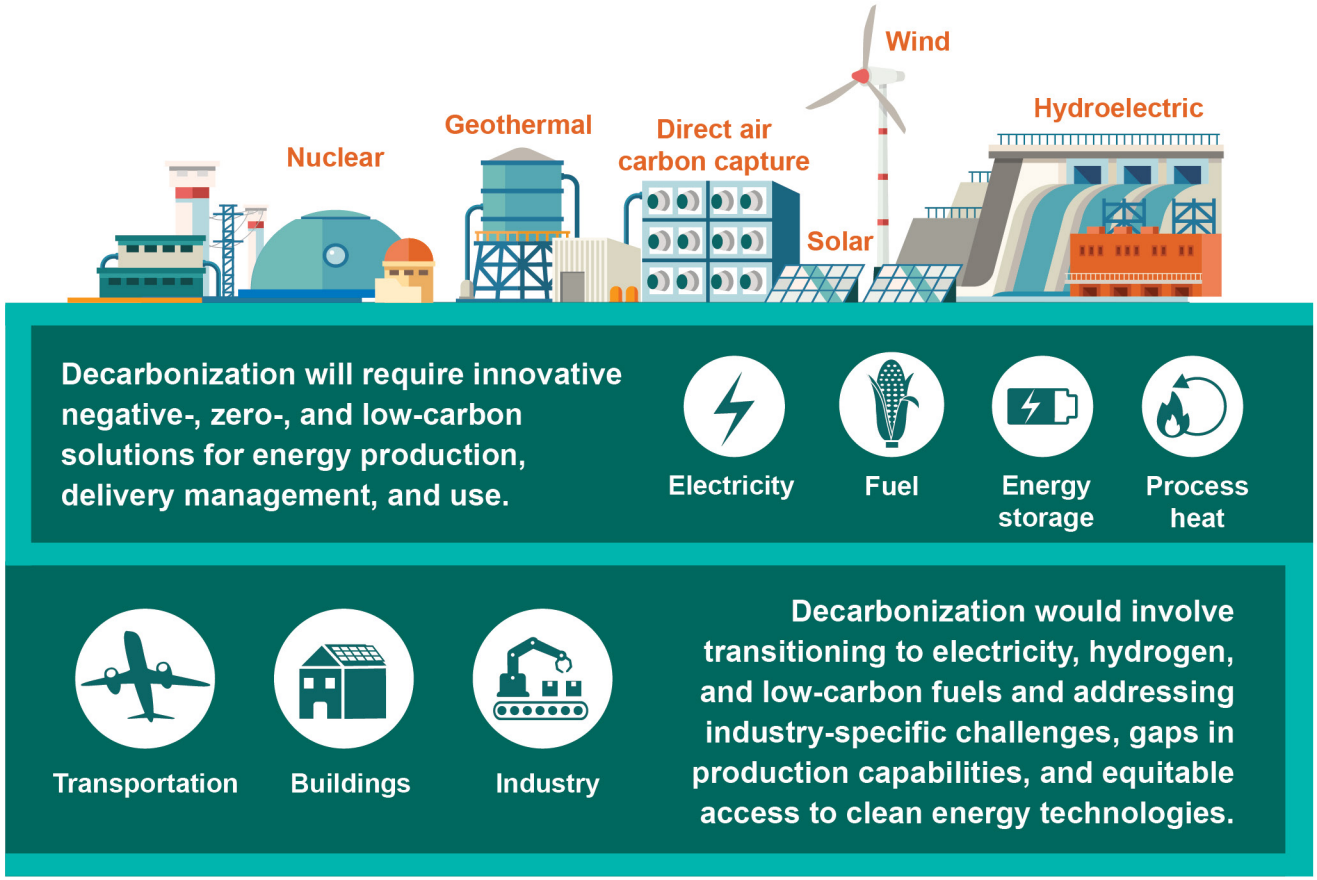
Concurrent changes in technologies, policies, and markets, in addition to their interconnections, can reduce GHG emissions while also increasing vulnerabilities of energy systems and communities to climate change and extreme weather (*very likely, very high confidence*). Compound and cascading hazards related to energy systems and additional stressors, such as cyber and physical threats and pandemics, create risks for all but disproportionately affect overburdened communities (*very likely, very high confidence*).

## Key Message 5.3

### Efforts to Enhance Energy System Resilience Are Underway

Federal, state, local, Tribal, and private-sector investments are being made to increase the resilience of the energy system to climate-related stressors, and opportunities exist to build upon this progress (*very high confidence*). Ongoing investments will need to include improvements in energy-efficient buildings; technology to decarbonize the energy system; advanced automation and communication and artificial intelligence technologies to optimize operations; climate modeling and planning methodologies under uncertainties; and efforts to increase equitable access to clean energy (*very high confidence*). An energy system transition emphasizing decarbonization and electrification would require efforts in new generation, transmission, distribution, and fuel delivery (*very high confidence*).

## Energy System Decarbonization




**Decarbonization will require innovative solutions across multiple sectors.**

**Figure 5.6.** Energy system decarbonization will rely on increased innovation, deployment of clean energy technologies including carbon capture, small modular nuclear reactors, hydrogen, and further integration and electrification of residential and commercial buildings, industry, and transportation. Figure credit: DOE, Idaho National Laboratory, NOAA NCEI, and CISESS NC.

**Recommended Citation**
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