

DBQ SOURCES: DECARBONIZATION

Document 1

Source: International Energy Agency. “Net Zero Roadmap: A Global Pathway to Keep the 1.5° C Goal in Reach.” 2023.

Achieving net zero emissions by 2050 will require nothing short of the complete transformation of the global energy system. By 2050, electricity will become the core of the energy system and will play a key role across all sectors, from transport and buildings to industry.

This will require huge increases in electricity system flexibility – such as batteries, demand response, hydrogen-based fuels, hydropower and more – to ensure reliable supplies. Renewable energy technologies like solar and wind are the key to reducing emissions in the electricity sector, which is today the single largest source of CO₂ emissions. In our pathway to net zero, almost 90% of global electricity generation in 2050 comes from renewable sources, with solar PV and wind together accounting for nearly 70%.

We also need to drive huge leaps in clean energy innovation. Most of the reductions in CO₂ emissions through 2030 come from technologies already on the market today. But in 2050, almost half the reductions come from technologies that are currently at the demonstration or prototype phase. Major innovation efforts must take place this decade in order to bring these new technologies to market in time. For example, carbon capture, utilization, and storage (CCUS) contributes to the transition to net zero in multiple ways. These include tackling emissions from existing energy assets, providing solutions in some of the sectors where emissions are hardest to reduce like cement, supporting the rapid scaling up of low-emissions hydrogen production, and enabling some CO₂ to be removed from the atmosphere.

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Document 2

Source: United Nations Environmental Programme. “The Sectoral Solution to Climate Change.” UNEP, 2023.

The only way to avoid catastrophic climate change is to rapidly cut our emissions of greenhouse gases. To keep the 1.5°C temperature target alive, the world needs to cut 2030 emissions by 42 percent. That might seem like a lot. But by focusing on key sectors, we can get there.

- Agriculture, forestry, and other land-based industries are responsible for 22 percent of emissions. We can reduce emissions by halting deforestation, ecosystem degradation, and restoring ecosystems.
- The global energy supply system—which includes the production of electricity and heat—is the largest single source of greenhouse gas emissions. We can cut emissions from the sector by, in part, increasing renewable energy capacity and improving energy efficiency rate. This transition could also create millions of jobs, improve air quality, save consumers on their electricity bills and expand electricity access.
- Emissions from the industry sector in 2019 reached 24 percent of total emissions. We can cut emissions by electrifying production processes and embracing new fuels. This will also require innovation in high-emission sectors like steel, cement, aluminum
- The transportation sector has the highest reliance on fossil fuels of any sector and is responsible for 15 percent of global emissions. These emissions are set to double, growing faster than any other industry. We could reduce emissions in this sector by switching to electric vehicles, more fully embracing public transit, and better designing cities to require less travel.
- The construction and operation of the world’s buildings is responsible for 37 percent of energy and process-related emissions. To decrease emissions in this sector we must minimize excess floor space, reduce energy intensity of buildings, and decrease emissions from construction.

DBQ SOURCES: DECARBONIZATION

Document 3

Source: Turrentine, Jeff. “What Are the Solutions to Climate Change?” Natural Resources Defense Council. December 2022.

It should go without saying that we, as individuals, are key to solving the climate crisis. This is not just by continuing to lobby our legislators and speak up in our communities but also by taking climate actions in our daily lives. By switching off fossil fuels in our homes and being more mindful of the climate footprint of the food we eat, our shopping habits, how we get around, our use of plastics and fossil fuels, and what businesses we choose to support (or not to support), we can move the needle.

But it’s when we act collectively that real change happens. It is how we can do even more than cut down on carbon pollution. Communities banding together have fought back fracking, pipelines, and oil drilling in people’s backyards. These local wins aren’t just good news for our global climate. They also protect the right to clean air and clean water for everyone. After all, climate change may be a global crisis but climate action starts in your own hometown.

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Document 4

Source: Intergovernmental Panel on Climate Change. “Summary for Policymakers, Figure SPM.7.” AR6 Synthesis Report: Climate Change 2023, IPCC, 2023.

There are multiple opportunities for scaling up climate action

