



How to Talk About:  
**THE CLIMATE & CLEAN ENERGY**

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# What You Need to Know in 60 Seconds

## WHAT'S AT STAKE:

We all want to protect the environment, but new extreme climate policies like the Green New Deal would:

- Fail to reduce emissions
- Have no actual impact on climate change
- Increase manufacturing and shipping (and emissions) from high-polluting countries
- Make energy less reliable for all
- Make energy too expensive for low-income individuals
- Undercut innovation in new green energy technology
- Ship jobs overseas

The “Green New Deal” would limit or ban fossil-based sources (petroleum, natural gas and coal, which currently provide over 80 percent of our energy) and replace them with renewable sources. But these sources are incapable of meeting even a fraction of today’s demand, much less future growth. Most importantly, this would make the world poorer, make it harder to achieve other environmental goals (particularly in the developing world) and leave more people suffering from extreme poverty.

## A BETTER PATH FORWARD: INNOVATION AND CONSERVATION INSTEAD OF PROHIBITION

The U.S. has a history of success in the energy sector because we have:

- Embraced conservation-based policies (that aim to do more with less) rather than prohibition-based policies (that ban certain types of energy or specific technologies).
- Developed new technologies to adapt to changing needs.

A combination of innovation and conservation will point the way to clean, affordable and reliable energy both here and abroad.

### Did you know?

- **EMISSIONS:** From 2005 to 2017, U.S. energy-related carbon dioxide emissions fell by 14 percent while the rest of the world increased emissions by 20 percent.
- **AIR:** Since 1970, the U.S. has reduced six key pollutants by 74 percent while growing our economy by 275 percent.
- **WATER:** In 1970, less than 60 percent of our nation’s drinking water systems met basic health standards. Today, 93 percent are up to standard.

**CLEAN ENERGY:** Energy sources that help decarbonize electricity use and reduce global emissions: hydroelectric dams, nuclear power plants, wind turbines, solar panels, natural gas and coal power plants that utilize carbon capture technology.

**CLIMATE CHANGE:** Changes in the earth's temperature and sea levels due to a complex combination of variables including solar activity, cloud cover, and ocean circulation. Some also blame human activity related to the burning of fossil fuels.

**EMISSIONS:** The release of specific types of gas into the atmosphere. When not specified, emissions usually refers to the release of carbon dioxide into the air. Increased carbon dioxide emissions trap heat in the atmosphere and disrupt the natural processes of our climate.

**FOSSIL FUELS:** Any natural fuel formed from the fossilized remains of living organisms. Fossil fuels include coal, crude oil and natural gas.

**FRACKING:** The process of drilling into the earth and injecting high-pressure liquid into subterranean rock to release the gas inside. This made natural gas much less expensive and opened up previously-unreachable reserves of gas.

**RENEWABLE ENERGY:** Energy produced from natural sources such as sunlight, wind, rain, tides and waves that are not depleted in any way when used. Renewable energy sources include wind power, solar power, and hydropower.

**ZERO EMISSIONS:** An energy source that does not emit any waste products that pollute the environment.

# Misperceptions v. Facts

## 1. MISPERCEPTION: Climate change is a grave and immediate threat to humanity and our most pressing environmental concern.

**FACTS:** Climate change is not an immediate threat to health and safety. Comparisons to crises like COVID-19 are an injustice to the thousands of families who've lost a loved one to COVID-19.

- One important difference between the pandemic and climate change is timing: The coronavirus spread quickly, necessitating immediate policy changes to avoid tremendous loss of life before we developed better treatments and a vaccine. With climate change, we have time to thoughtfully consider the best ways to mitigate risk and pursue ingenuitive solutions.
- Climate change is something to be understood, not feared. The climate has always been changing, and the most

extreme changes occurred well before the industrial revolution or before so many people had SUVs.

- Human activity does have an impact on the climate. To date, we have made the planet mildly warmer. Since 1850, global temperature has increased around 1 degree Celsius (or 1.8 degrees Fahrenheit).
- Scientists continue to work towards a better understanding of our climate and the human impact. Meanwhile, human beings have proven able to adapt to a changing climate.
- Calling climate change a global crisis implies that it's out of our control when in fact reducing global emissions is an achievable, bipartisan goal

(Sources: [Forbes](#), [IPCC](#), [Life: Powered](#))

## 2. MISPERCEPTION: We need to enact the Green New Deal for clean energy sources to become more widespread.

**FACTS:** Clean energy capacity has doubled in the last 15 years. This trend will continue and clean energy sources will play a growing role in our energy sector as innovation continues.

- Between 2018 and 2019 alone, clean power capacity increased by 12 percent

(a 20 gigawatt increase) while the cost of this energy increased by only 1 percent. *Not only is clean energy becoming more plentiful, it is also becoming more affordable.*

- Since 2009, U.S. renewable energy capacity has doubled.

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- Goldman Sachs predicts renewable energy investment will beat oil and gas for the first time ever in 2021, as it is on track to claim 25 percent of total energy capital expenditure worldwide.
- Before the pandemic, there were nearly 3.3 million Americans working in clean energy. In 2018, clean energy employment grew 3.6 percent and accounted for 4.2 percent of all jobs added nationally that year.
- Renewable energy is already the fastest growing source of new U.S. electricity generation.

**(Sources: Frankfurt School—UNEP Collaborating Centre for Climate & Sustainable Energy Finance, Balkan Green Energy News, E2, National Renewable Energy Laboratory)**

### **3. MISPERCEPTION: Climate change science is “settled,” and all scientists agree.**

#### **FACTS:**

- While the majority of climate scientists agree that the climate is warming and humans are contributing to this trend to some degree, the science is far from “settled.”
- Natural climate variables—such as solar activity, the presence of water vapor (clouds), volcanic activity and ocean circulation—also play a role. Climate models aren't sophisticated enough to include, never mind predict, how those variables interact and impact climate projections.
- Scientists even debate the push towards “consensus” around climate change, because science has never been established by consensus-building, which is the work of politicians, but rather by scientists challenging or testing the status quo through the scientific method.
- Climate science models have a history of making predictions that are not an accurate reflection of future real-world observations and outcomes.
- This doesn't mean that we shouldn't take climate change seriously, but that we can and should continue to seek information about the climate and the impact of carbon and other variables and mitigation strategies.

**(Sources: IPCC, Popular Technology, Forbes, Climate Etc.)**

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#### **4. MISPERCEPTION: Floods, hurricanes, droughts and other extreme weather events have become more frequent and more intense because of climate change.**

##### **FACTS:**

- Claims of more frequent or intense weather events are based on cherry-picked information that focuses on out-of-context costs or manipulated timeframes. In reality:
  - According to a 2014 report from the Intergovernmental Panel on Climate Change, there has been no increase in hurricanes, floods, droughts or tornadoes within the past 30 years.
  - In the United States, there has been no increase in the average frequency or severity of hurricanes for more than a century.
  - More broadly, the IPCC states that there is no strong basis for directly connecting natural disasters to human-caused climate change.
- While the aggregate costs of disasters have increased, this is due to global population growth and increased amounts of wealth situated in areas prone to be hit by natural disasters.
  - For example, the same hurricane hitting a beach with no or few houses does little overall damage, while it hitting a densely developed coastline does a great deal of damage.
- When these costs are adjusted in terms of global GDP, 2018 had the lowest losses from disasters since 1990.
- In terms of loss of life, the United States has a successful track record of significantly reducing these numbers:
  - In 1900, despite the area having a far smaller population than now, the Great Galveston Hurricane claimed over 8,000 lives compared to Hurricane Harvey, a similar hurricane in terms of size, intensity and geographic landfall, which claimed 88 lives in 2017.
- Whether at the local, state or federal level, we are better off focusing more on appropriate planning, enhanced forecasting, reliable warning systems and adequate infrastructure to mitigate storm damage rather than influencing climate change.

**(Sources: [American Meteorological Society](#), [WSJ](#), [Nature](#), [IPCC](#))**

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## **5. MISPERCEPTION: Achieving net zero emissions or extreme decarbonization in the U.S. will stop climate change.**

### **FACTS:**

- Numerous studies have found that reducing U.S. emissions to zero would have a negligible effect on either global emissions, future temperature or sea level.
    - This is mainly because future emissions growth from China and India will dwarf any major emissions reductions from the U.S.
      - In 2017 alone, China's emission growth was more than three times greater than U.S. reductions.
    - If the U.S. had shifted to 100 percent renewable electricity in 2020, global carbon dioxide emissions would be reduced by only 0.9 percent by 2050, and global temperatures by only 0.025 degrees Celsius.
  - Another report found that eliminating all U.S. emissions would make the world 0.2 degrees Celsius cooler by the year 2100, and sea-level rise would be slowed by less than 2 centimeters.
  - The United States is making great strides toward reducing carbon emissions and using cleaner energy, and should continue to do so, but its biggest impact will be in helping develop other innovative ways to make clean energy more efficient and reliable.
- (Sources: [Kevin Dayaratna, PhD, Life: Powered, AEI](#))

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## **6. MISPERCEPTION: A 100 percent shift to renewable energy by 2050 is a smart policy goal.**

### **FACTS:**

- Fossil-based energy (coal, oil and natural gas) currently provides around 80 percent of the energy consumed in the United States.
  - Clean, renewable energy sources are playing a growing role as a source for energy in the United States. This is a trend we want to continue.
  - However, quickly replacing fossil-based energy with renewables like wind and solar faces a range of major technical hurdles, mainly because these sources require more land, more money and more effort to capture, store, and deliver consistently (because wind and sunlight aren't constant).
  - Renewable energy sources are also limited because we do not have the energy storage technology to make them sufficiently reliable. This leaves populations particularly vulnerable to blackouts during extreme weather events.
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Issues to consider as we move to more renewable energy:

### Energy Density

- The level of energy density determines how much land is required to generate energy from a particular source.
- Fossil fuels have a high energy density having been created from the compression of dead plants and animals over millions of years.
- The power density of a fossil fuel power plant is 100 times greater than a solar farm and 1000 times greater than a wind farm.
  - To replace 1 gigawatt (Gw) of power from a fossil-based power plant would require 555 wind turbines covering 116 square miles or 27 square miles of solar panels.

Another way to account for energy density is through energy output relative to investment—the proverbial bang for your buck.

- Over a 30-year period, \$1 million spent on solar would produce 40 million kilowatt hours.
- \$1 million spent on wind would produce 55 million kilowatt hours.
- \$1 million spent on natural gas production would generate 300 million kilowatt hours, or about six times as much power for the same investment.

### Capture

- Capturing and integrating wind and solar into the existing grid comes with another series of technical issues with significant environmental impact: transporting the energy.
- Areas conducive to wind or solar farms tend to be far away from where the energy is actually consumed. We don't have nearly enough transmission lines and grid infrastructure to transport that level of renewable energy.
- Integrating this energy into the grid would require a massive build-out of transmission lines and related grid infrastructure.
- **A transition to 100 percent renewable electricity by 2050 would require a build out rate that is 14 times bigger than the grid build-out rate that has taken place over the past half-century.**

### Intermittency

- Finally, the intermittency of renewables, meaning that they only work when the sun is shining or the wind is blowing, is another major technical problem. Engineers continue to develop battery technologies as one way to address this issue but are far from solving the problem.
- **If we had to rely on battery power today, current battery production would**

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**provide only three minutes of annual U.S electricity demand.**

This isn't to say that American ingenuity won't ever overcome these challenges, but

suggesting this scale of a transition in the next few decades ignores the challenges that make this far from realistic.

(Sources: [Roger Pielke Jr, Forbes](#), [Manhattan Institute](#))

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## **7. MISPERCEPTION: Climate change policies will help vulnerable and low-income communities.**

### **FACTS:**

- Proposed federal climate policies like the Green New Deal are designed to discourage the use of fossil-based energy by making it more expensive.
- While these policies will have no measurable impact on climate, they will substantially raise energy prices.
  - One report found that gasoline prices alone could increase to \$13 per gallon.
  - Another analysis found that these policies would cause double digit electricity price increases in the majority of states.
- This will make electric power too expensive for many Americans.
- Increased energy costs hurt low-income

and fixed-income communities the most.

- Low-income families already spend a larger portion of their household budgets on energy costs, so any increase forces them into a situation where they are choosing between electricity and food.
- One survey of low-income households by the National Energy Assistance Directors Association found that, partly due to high energy costs, low-income individuals will forgo food, medical or dental care or will keep their households at unsafe temperatures, causing sickness.

(Sources: [Institute for Energy Research](#), [NEADA](#))

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## **8. MISPERCEPTION: Fossil-based energy is bad for the planet and harmful to people.**

### **FACTS:**

- Decades of efforts to refine fossil fuel production, alongside the development of advanced energy technologies, have made the process cleaner:

- After decades of using “scrubbing” technology, U.S. power plants have reduced mercury emissions by 86 percent, sulfur dioxide by 94 percent and nitrous oxide by 84 percent.

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- These industry actions coupled with balanced clean air regulations are why American citizens are breathing air that is 74 percent cleaner today than the 1970s.
  - Access to affordable reliable energy has already lifted billions of people out of poverty and produced significant human flourishing.
  - Reliable energy enables modern amenities like lighting, electric or gas cooking, air conditioning, life-saving heat, refrigeration for medicine and food and clean water treatment systems.
  - Since access to energy has become commonplace throughout the United States, life expectancy has more than doubled, and global poverty has been reduced from over 40 percent to less than 10 percent of the global population.
  - Innovative solutions such as carbon capture are enabling us to make traditional “dirty” energy sources even cleaner. Instead of trying to ban these proven and reliable energy sources, we should support efforts to make them cleaner.
- (Sources: [EEI](#), [TPPF](#))

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## **9. MISPERCEPTION: Renewable energy sources, such as wind, solar and battery power, are “zero emissions.”**

### **FACTS:**

- The process by which we capture, transform and consume wind and solar energy is not “zero emissions.”
- Wind energy requires the development of wind turbines, and solar requires the use of solar panels. Both of these must be coupled with battery storage to be somewhat effective as an energy source.
- Each of these technologies comes with a range of mining, manufacturing, production, transmission and disposal costs for the environment. This affects their total emissions calculations.
- Wind and solar produce a high level of non-recyclable waste and other environmental harms:
- A recent study found that the building of one wind turbine requires 900 tons of steel, 2,500 tons of concrete and 45 tons of non-recyclable plastic.
- Solar farms also require cement, steel and glass as well as other metals.
- Solar panels alone are expected to produce about 250,000 metric tons of waste in 2016, and that number is expected to reach 78 million metric tons by 2050.

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- Embedded in solar panels is an array of toxic elements like lead and cadmium that if broken in landfills, can leach into local water sources.
- This is one reason California is considering whether to classify solar panel waste as “hazardous.”
- The International Energy Agency forecasts that global silver and indium mining will jump 250 percent and 1,200 percent respectively over the next couple of decades to provide the materials necessary for solar panels. **It should be noted that most of these special metals are mined in countries that do not ascribe to the same level of clean air, water, land or labor protections as the United States.**

When it comes to batteries, it gets even more complicated.

- One of the main elements of battery storage technology is cobalt.
- Due to its vital role in renewable energy and “zero emissions” technologies like electric vehicles, cobalt use has tripled

- in 2018 and is expected to double again by 2020.
- Cobalt is mined all over the world, but close to 60 percent of the global supply comes from the Democratic Republic of the Congo (DRC).
    - According to UNICEF and Amnesty International, around 40,000 children are involved in cobalt mining in the DRC where they make a few dollars a day.
    - In these African mining operations, work starts as early as four years old, when children can pick cobalt out of a pile. At 10, children are forced to carry heavy sacks of cobalt on their backs to rivers for washing.

None of this means that solar and wind power are bad or should be abandoned; it simply means that the term “zero emissions,” which implies no carbon emissions are produced as these forms of energy are used, **may be misleading in terms of the overall environmental impact of these energy sources.** (Sources: [Quillette](#), [Manhattan Institute](#), [Energy 45](#), [CBS](#), [IER](#))

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## **10. MISPERCEPTION: The Paris Climate Agreement is the best way to globally address climate change.**

**FACTS:** The United Nations has been very ineffective at producing tangible results in terms of reducing emissions.

- Despite adoption of the Paris Climate Agreement and other international commitments to reduce emissions for over *continued >>*

- 27 years, global emissions have risen about 1.5 percent annually over the past decade.
- 192 countries—everyone it seems from Algeria to Samoa—signed the Paris Agreement. Only 17 are actually meeting their commitments, in most cases because they promised very little.
  - China's carbon emissions continue to skyrocket, and in 2017 their increases completely wiped out U.S. reductions more than threefold.
  - India saw emissions rise nearly 5 percent in 2017, and this increase is projected to continue.
  - **All European Union countries are off target in reaching initial Paris commitments** and have failed to adjust domestic policies to meaningfully advance them.
  - Germany, after spending \$580 billion on renewable energy, has not achieved meaningful carbon emissions reductions even as citizens pay electricity rates that have increased by 50 percent.
- (Sources: [AEI](#), [The Hill](#), [IEA](#), [Climate Action Network](#), [Life: Powered](#), [UNEP](#), [Copenhagen Consensus Center](#))

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## **11. MISPERCEPTION: The United States is no longer a global leader on the environment or climate change.**

**FACTS:** The United States leads the world in all manner of emissions reductions, including energy emissions:

- From 2005 to 2017, U.S. energy-related emissions fell by 14 percent while the rest of the world increased their emissions by 20 percent.
- Although U.S. emissions ticked up slightly in 2018 due to a robust economy, the Energy Information Administration (EIA) predicts emissions will continue to decrease in 2019 and 2020.
- According to the International Energy Agency, even with the incremental increase, emissions in the United States

remain around their 1990 levels, which is 14 percent below their peak in 2000. **This is the largest absolute decline among all countries since 2000.**

When it comes to other emissions, the United States is also a world leader.

- Since 1970, the combined emissions of six main air pollutants—ozone, lead, particulate matter, nitrous oxide, sulfur dioxide and carbon monoxide—have dropped by 74 percent. In other words, our air is 74 percent cleaner today than it was in 1970.

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- In fact, our air is at its cleanest point since the U.S. Environmental Protection Agency started recording these trends.
- Most impressive is that this environmental progress has occurred alongside significant growth: The economy has grown 275 percent since 1970, and we have seen increased population, increased vehicles miles traveled, and more energy consumption.

As a result, we enjoy some of the world's best access to clean air and water:

- Globally we are the only highly populated nation that meets the World Health Organization's most stringent air quality standards.
- According to the State of Global Air report, the United States has

achieved the largest global decrease in percentage of people living in areas exceeding the WHO air quality guideline, plummeting from 50 percent in 1990 to just 3 percent in 2017.

- We also are number one in terms of access to clean drinking water.

Given the United States' proven track record of success in protecting the environment while also growing the economy, we can have the biggest global impact by exporting modern energy technologies and related expertise to the rest of the world so they can catch up with our progress.

(Sources: [EPA](#), [EIA](#), [IEA](#), [TPPF](#), [WHO](#), [State of Global Air](#))

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## **12. MISPERCEPTION: We have a cleaner environment today thanks to government intervention, which means we need more of it.**

**FACTS:** America's environmental leadership is largely due to **private property rights and the private sector's support of scientific and technological innovations** that have enhanced our energy security and economic growth.

Long before the EPA existed, the private sector was fighting against environmental pollution, due to property rights.

- In fact, the Founders believed that American lands should be privately

owned as a means of promoting economic development and to strengthen the nation.

- As a result, about 816 million acres of public domain land was privatized between 1781 and 2015, with 97 percent of the privatization taking place before 1940.
- Views of private land ownership changed in the 20th century as decision making by politicians and bureaucrats took favor.

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- After 1940, privatizing public lands became politicized and soon after, it stopped.
- As a result, the U.S. has been left with a huge inventory of federally owned land, amounting to roughly 640 million acres, an area over seven times larger than Germany.

Sadly, the worst pollution and environmental damage often happens on federally owned properties.

- For example, government-owned forests are less likely to have replanting and burning requirements and are therefore more likely to have forest fires. Since no one person or entity derives direct benefit from this property, the incentive for those who use, but do not own, federal lands is to get in and take what you can, while you can. That's known as

the “**tragedy of the commons.**” Property rights are key to good stewardship, because if you own something, you are more likely to take care of it.

Market forces also cause economic growth, which in turn leads to environmental improvements. Put simply, poor people may appreciate a clean environment but nonetheless sacrifice clean water and air, healthy forests, and wildlife habitat for economic growth. **But as their incomes rise above subsistence, the environment becomes a higher priority.** As Clemson University professor Robert McCormick noted, “higher GDP reduces total net [greenhouse gas] emissions.”

(Sources: [Forbes](#), [Congressional Research Service](#), [Hoover Institution](#), [McClatchy DC Bureau](#), [LA Times](#))

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### **13. MISPERCEPTION: Nuclear energy is too dangerous and dirty to play a role in our energy sector.**

**FACTS:** Nuclear energy is among the energy sources with the lowest emissions as well as being safe and reliable. We should welcome an expanded role for nuclear energy.

- Nuclear energy is the most reliable energy source without carbon emissions.

- This is possible because reactors use uranium, not fossil fuels.
- Like other industries working with dangerous materials, nuclear power plants work to minimize the likelihood of accidents and avoid major consequences.
- While any accident is unfortunate, there have only been three major accidents to

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occur in over 17,000 cumulative reactor-years of commercial nuclear power operation in 33 countries.

- Nuclear power's track record over six decades has proven that nuclear power is a safe energy source. The risk of accidents is low and continually declining as nuclear technology continues to improve.
- While nuclear energy does produce nuclear waste, the radioactivity of the waste decays over time.
  - High-level waste can be stored as the

radioactivity decays until it is safe to dispose.

- There is a straightforward and safe process to dispose of low-level waste.
- Given that other clean energy sources, such as wind and solar, still have challenges such as intermittency, nuclear energy has an important role to play in our nation's clean energy future.

**(Sources: [Nuclear Energy Institute](#), [World Nuclear Association](#), [World Nuclear Association](#))**

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#### **14. MISPERCEPTION: Fracking is bad for the environment.**

##### **FACTS:**

- Natural gas has proven to be a crucial piece in America's carbon reduction leadership. The reliability of natural gas has made it an important complement to the more unreliable renewable energy sources.
- Fracking has made natural gas much less expensive and encouraged a move away from coal-powered energy. This has led to dramatic improvements in air quality throughout the country.
- As natural gas has overcome coal to become the largest source of electricity in the United States, it has played a vital role in reducing U.S. emissions in the last two decades.

- The large, previously-untapped reserves of natural gas lowered prices while providing the U.S. with a reliable source of energy.
- Natural gas is the cleanest burning of all hydrocarbon fuel sources and today is responsible for 38.4 percent of all U.S. electricity generation.
- Until the intermittent nature of many renewable sources is overcome, natural gas will continue to bridge the gap and enable states and countries to reasonably incorporate some renewable energy into their power grids.

**(Sources: [BP](#), [U.S. Energy Information Administration](#))**

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## 15. MISPERCEPTION: Electric vehicles are environmentally friendly.

**FACTS:** Electric vehicles may not be gas-powered but they are charged from the local electric grid. This means that they are still associated with any emissions released during the production of that electricity, which in many states means coal and natural gas.

- America's electric grids still get the majority of their power from burning fossil fuels—an estimated 60% of total electricity.
- Even though electric vehicles aren't directly powered by gas, they still aren't carbon neutral.

- The increased number of batteries needed for electric vehicles also contribute to increased pollution.
- Mining and processing minerals like cobalt and lithium causes significant air pollution from dust and toxic water pollution.
- Widespread adoption of electric vehicles would have a negligible impact on U.S. emissions: the overall reduction would be less than one percent of the total forecast energy-related CO<sub>2</sub> emissions through 2050.

(Sources: [Manhattan Institute](#), [U.S. Energy Information Administration](#))

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## 16. MISPERCEPTION: The Green New Deal is non-binding, so there is no harm in setting ambitious climate change “goals.”

### FACTS:

- While the Green New Deal is nonbinding, once the deal is embraced, the entire machinery of government and business will be enforcing and contorting around these new rules.
  - Here's an example: The federal budget resolution that is passed by Congress every year is also full of nonbinding spending proposals, but is generally the framework for the priorities that become the federal appropriations for the fiscal year.
- In order to reach the goals laid out in the Green New Deal in the next 10

years, the government would need to enact legislative mandates that would dramatically transform the U.S. economy.

- It's important to note that many of the Green New Deal proposals already exist as pending legislation under consideration in Congress.

So technically, the Green New Deal benchmarks are “goals,” but if the framework is embraced, the “goals” could quickly be elevated to regulation or law.

(Sources: [Congress.gov](#), [USA Today](#))

# Quiz #1: Science

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**1** Is our planet warmer today than it was in 1850?

- A.** Yes
  - B.** No
- 

**2** How much impact has human activity had on global warming?

- A.** Scientists agree that human activity is a prime cause
  - B.** Scientists agree that human activity has played a small role
  - C.** There is no consensus
- 

**3** Which of the following weather events have become more frequent and intense because of climate change?

- A.** Floods
- B.** Hurricanes
- C.** Droughts
- D.** Tornadoes
- E.** All of the above
- F.** None of the above

**4** True or false: The sea level is rising faster than ever.

- A.** True
  - B.** False
- 

**5** Is climate change something to fear?

- A.** Yes
- B.** No

# Quiz #2: Technology

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**1** What are the technological hurdles to shifting to renewable energy?

- A.** Renewables provide less power
  - B.** Integrating wind and solar into the existing power grid
  - C.** Renewable energy sources aren't reliable
  - D.** All of the above
  - E.** None of the above
- 

**2** Is there a way to provide energy to Americans with no pollution or “zero emissions”?

- A.** Yes
  - B.** No
- 

**3** Has fracking helped reduce emissions??

- A.** Yes
- B.** No

# Quiz #3: Policy Realities

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**1** Fossil-based energy (coal, oil and natural gas) currently provide what percent of the energy consumed in the United States?

- A.** 20 percent
  - B.** 40 percent
  - C.** 60 percent
  - D.** 80 percent
  - E.** None of the above
- 

**2** Which of the following statements is true?

- A.** From 2005 to 2017, U.S. energy-related carbon dioxide emissions fell by 14 percent while the rest of the world increased emissions by 20 percent.
  - B.** Since 1970, the U.S. has reduced six key pollutants by 74 percent despite growing our economy by 275 percent.
  - C.** In 1970 more than 40 percent of our nation's drinking water systems failed to meet basic health standards. Today, 93 percent of U.S. community water systems consistently meet all health standards.
  - D.** All of the above
  - E.** None of the above
- 

**3** What would be the effects of the U.S. eliminating all human-generated greenhouse gas emissions?

- A.** Climate change will be greatly slowed, with minimal effects on the economy.
  - B.** Negligible global climate effects, with significant bad effects on the economy
  - C.** Climate change will be solved and our economy will boom
- 

**4** In 2017 alone, China's emissions increase wiped out U.S. reductions by more than 3-fold?

- A.** True
  - B.** False
- 

**5** Which group would benefit from the Green New Deal, a climate change proposal in Congress that would discourage the use of fossil-based energy and aims to eliminate all human-generated greenhouse gas emissions?

- A.** Low-income communities
- B.** High-income communities
- C.** Both a & b
- D.** None of the above

*continued >>*

**6** International agreements such as the Paris Climate Agreement are effective ways to globally address climate change.

- A.** True
  - B.** False
- 

**7** In which ways is the U.S. a global leader on the environment and climate change?

- A.** Reduction in energy-related emissions
- B.** Reduction in other emissions - ozone, lead, particulate matter, nitrous oxide, sulfur dioxide and carbon monoxide
- C.** Meeting the World Health Organization's most stringent air quality standards
- D.** Having the best access to clean drinking water
- E.** All of the above

# Quiz #1 Answers

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## Q1 ANSWER: A

Yes. Today, the planet is mildly warmer than it was in 1850. Since 1850, global temperature has increased around 1 degree Celsius (or 1.8 degrees Fahrenheit).

Sources: [Forbes](#), [IPCC](#), [Life: Powered](#)

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## Q2 ANSWER: C

There is significant academic debate and disagreement as to how much influence human activity has had compared to other factors such as solar activity, the presence of water vapor, volcanic activity and ocean circulation.

Sources: [IPCC](#), [Popular Technology](#), [Forbes](#), [Climate Etc.](#)

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## Q3 ANSWER: F

None of the above. According to a 2014 report from the Intergovernmental Panel on Climate Change, there has been no increase in hurricanes, floods, droughts or tornadoes within the past 30 years. In the United States, there has been no increase in the average frequency or severity of hurricanes for more than a century. More broadly, the IPCC states that there is no strong basis for directly connecting natural disasters to climate change.

Sources: [American Meteorological Society](#); [WSJ](#); [Nature](#); [IPCC](#)

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## Q4 ANSWER: B

False. Sea levels have been slowly rising and falling for thousands of years, and the Earth has gone through warming and cooling cycles. The average rate of sea level rise since about the year 1800 is roughly eight inches per century. This rate remains unchanged. Furthermore, there is no convincing evidence to support the notion that sea level changes can be tied to human-caused climate change. Increases in the cost impacts of flooding are due to a build-out of expensive homes and infrastructure in flood-prone lowlands and along coastlines, not rising sea levels. Additionally, the dominant causes of local sea level rise are natural oceanic and geologic processes as well as land use practices.

Sources: [CO2 Coalition](#), [Climate Etc](#)

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## Q5 ANSWER: B

No. Climate change is something to understand, not fear. The climate has always been changing, and the most extreme changes occurred well before the industrial revolution or before SUVs.

Sources: [Forbes](#), [IPCC](#), [Life: Powered](#)

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# Quiz #2 Answers

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## Q1 ANSWER: D

All of the above. Putting aside the very high costs of renewable energy, there are other hurdles: The power density (or energy power produced per plant) of a fossil fuel power plant is 100 times greater than a solar farm and 1000 times greater than a wind farm. Furthermore, integrating wind and solar power into the existing power grid would require a massive build-out of transmission lines and infrastructure. Finally, renewable energy sources only work when the sun is shining or the wind is blowing. **Sources:** [Manhattan Institute](#)

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## Q2 ANSWER: B

No. But thanks to new fossil fuel-scrubbing technologies, our energy is getting cleaner: Americans breathe air that is 74 percent cleaner today than it was in the 1970s. Additionally, carbon capture and storage technology is a way to capture carbon emissions from a variety of sources, thus reducing the amount of carbon emitted into the air from our more traditional power sources like coal and natural gas.

Sadly, even renewable energy produces some pollution: Solar panels have toxic components that fill landfills and leak into water sources. These include lead

and cadmium and have led California to consider classifying solar panel waste as “hazardous.” Similarly, wind energy requires the development of wind turbines, which come with a range of mining, manufacturing, production, transmission and disposal implications. A recent study found that the building of one wind turbine requires 900 tons of steel, 2,500 tons of concrete and 45 tons of non-recyclable plastic.

Nuclear power, however, is a great option: currently it's the only power source we have that is carbon-free, cheap, and reliable. And nuclear technology is improving to have smaller, more efficient reactors, which will make it an even smarter solution to our energy problems. **Sources:** [Gillette](#), [Manhattan Institute](#), [Energy 45](#), [CBS](#), [IER](#)

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## Q3 ANSWER: A

Yes. The fracking boom of the early 2000s made natural gas much cheaper to access. Fracking, the process of drilling into the earth and injecting high-pressure liquid into subterranean rock to release the gas inside, opened up vast reserves of natural gas that were previously inaccessible. The subsequent

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move toward natural gas (and away from coal-powered energy) has led to dramatic improvements in air quality. The greater reliance on natural gas, as well as efforts to clean up coal, has resulted in power plants reducing mercury emissions by 90 percent, sulfur dioxide by 94 percent, and nitrous oxide by 86 percent.

# Quiz #3 Answers

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## Q1 ANSWER: D

80 percent. Fossil-based energy sources (coal, oil and natural gas) currently provide around 80 percent of the energy consumed in the United States. **Source:** [Pew Research Center](#)

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## Q2 ANSWER: D

All of the above. Historically, the U.S.'s conservation-based policies (that aim to do more with less unlike prohibition-based policies that ban certain types of energy or specific technologies) have yielded positive results. **Sources:** [U.S. Energy Information Administration](#); [Environmental Protection Agency](#)

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## Q3 ANSWER: B

Numerous studies have found that reducing U.S. emissions to zero would have a negligible effect on global emissions. This is mainly because future emissions growth from China and India will dwarf reductions from the U.S. Meanwhile, low-income families already spend a larger portion of their household budgets on energy costs, so any increase in price could force them into a situation where they are choosing between fuel and food. **Sources:** [Institute for Energy Research](#), [ACCCE](#), [Life: Powered](#)

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## Q4 ANSWER: A

True. While the U.S. should and will continue to work to find cost-effective ways to reduce emissions, any emissions reductions will be wiped out on the global scale by the largest carbon emitter: China. While China has promised to reduce emissions, its promises are meager compared to most other countries: it only promises to reduce the quantity of emissions by 65 percent by 2030. Furthermore, China's track record suggests that its word cannot be trusted. Instead of putting faith in China's promises, we should focus on the country's track record and see that in 2017 alone, China's emissions *increase* (not just total emissions) was three times larger than the emissions reductions made by the U.S. **Sources:** [AEI](#), [New York Times](#)

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## Q5 ANSWER: D

None of the above. The Green New Deal would make energy less reliable for *all Americans* and prohibitively expensive for low-income individuals. While the Green New Deal will have no measurable impact on climate, it will lead to double-digit increases in the price of electricity in the majority of states and gasoline prices could increase to \$13 per gallon. This

*continued >>*

would disproportionately impact those who live on low or fixed incomes. In fact, one survey of low-income households by the National Energy Assistance Directors Association found that in the face of increased energy costs, low-income individuals will forgo food, medical or dental care or keep households at unsafe temperatures. **Sources:** [Institute for Energy Research](#), [NEADA](#)

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#### **Q6 ANSWER: B**

False. The United Nations has proven to be very ineffective at producing tangible results in terms of reducing emissions. Despite adoption of the Paris Climate Agreement and other international commitments to reduce emissions over 27 years, global emissions have risen about 1.5 percent annually over the past decade. Only 17 of 192 countries that have signed onto the Agreement are actually meeting their commitments. Even countries such as Germany, which has spent \$580 billion on renewable energy, have not achieved meaningful carbon emissions reductions while electricity rates have increased by 50 percent. **Sources:** [AEI](#), [Climate Action Network](#), [Life: Powered](#), [UNEP](#)

#### **Q7 ANSWER: E**

All of the above. The U.S. is the global leader on the environment and climate change. From 2005 to 2017, U.S. energy-related emissions fell by 14 percent while the rest of the world increased their emissions by 20 percent. Since 1970, the combined emissions of six other main air pollutants have dropped by 74 percent (while at the same time our economy has grown 275 percent and we have seen increased population, vehicles miles traveled, and more energy consumption). Globally, we are the only highly populated nation that meets the World Health Organization's most stringent air quality standards. Finally, we are also number one in terms of access to clean drinking water. **Sources:** [EPA](#), [EIA](#), [IEA](#), [TPPF](#), [WHO](#), [State of Global Air](#)