

climate choices

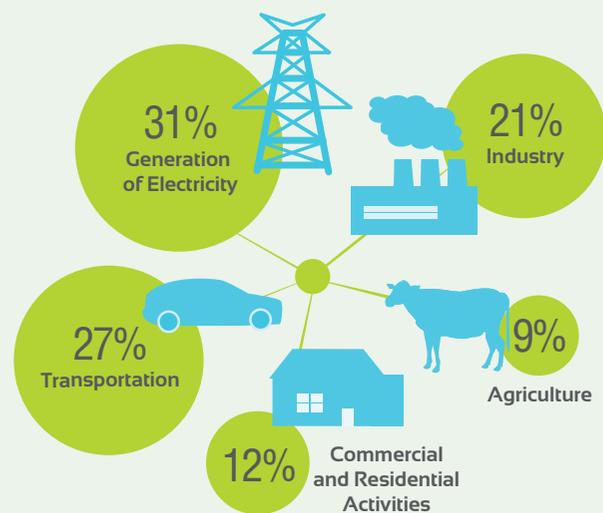
how should we meet the challenges of a warming planet?

Evidence that the climate is changing is all around, whether it's unusual snowfall, longer summers, deeper droughts, more destructive wildfires, or stronger storms. Occasional odd weather and weather cycles are nothing unusual, but the hotter, more extreme and unpredictable weather being experienced in the US and around the world points to dramatic changes in climate—conditions that take place over years, decades, or longer.

Climate change is not only an environmental problem. It is also a public-health issue, a threat to national security, and an economic challenge of considerable magnitude. Only recently has the public debate shifted away from weighing the evidence to asking what we should do about our changing climate and the effects that are beginning to be felt. The central question has become: What should we do about our changing climate and the effects that are beginning to be felt across the country and around the world?

The guide presents three options for addressing climate change that are based on the views and concerns of people from across the country. Climate change, and how we choose to respond to it, puts these essential values into tension with each other.

These are not the only options for addressing climate change, but they capture a range of commonly held views—their benefits along with their drawbacks.



SOURCES OF GREENHOUSE GAS EMISSIONS

Greenhouse gases, such as carbon dioxide and methane, trap heat and make the planet warmer. These occur naturally, but human activities are responsible for almost all of the increase in greenhouse gases in the atmosphere over the last 150 years. This dramatic increase corresponds with warming average temperatures around the world.

(US Environmental Protection Agency, Sources of Greenhouse Gas Emissions, 2013)

➤ **Some questions to consider** as you discuss the three options:

- How does this option address our concerns about climate change?
- What worries us or makes us uncomfortable about this approach?
- If this approach worked perfectly, what would the trade-offs or consequences be?

option 1: sharply reduce carbon emissions

We need to take aggressive action to reduce our energy consumption and other climate-changing behaviors. If we do not move swiftly to tackle the problem of climate change at its source, we risk catastrophic effects that we—and future generations—will not be able to handle. **BUT** this approach could limit our personal choices and freedom. And some people, communities, and businesses will be affected by the required changes more than others.

Examples of What Could Be Done

Some Trade-Offs to Consider

Require that states meet a national low-emission standard (with a percentage of energy needs coming from renewable sources).

This could displace workers and harm communities that rely on fossil-fuel industries. So-called “clean” energy sources also carry environmental and health downsides.

Institute a carbon-credit (“cap-and-trade”) system that limits emissions.

Capping emissions over time and “trading” credits could leave communities without immediate help for health and safety concerns.

Charge fossil-fuel providers a carbon fee, which would encourage Americans to choose low-carbon, lower-cost alternatives. Dividends from the fees could be rebated to households.

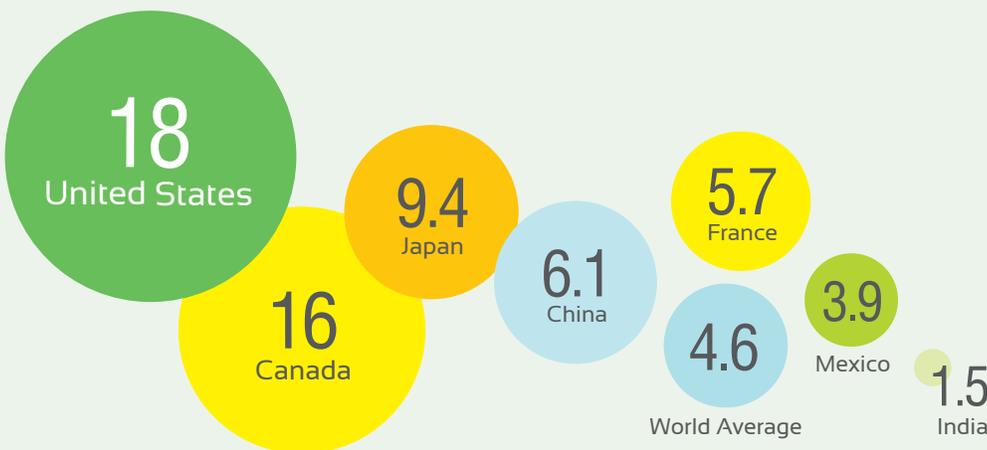
A carbon fee would burden poor Americans by raising the costs of basic necessities, even if a rebate is later provided.

Require the use of electric vehicles, ban cars in some areas, and redirect highway funds to create bike lanes and pedestrian-friendly neighborhoods.

It could take decades to make these changes when we need to cut emissions immediately, and electric vehicles still have environmental impacts.

Require dramatic reductions in household energy use through weatherization, efficient appliances and tires, and reduced driving.

These changes could strain low- and moderate-income communities and families that are already struggling.



PER CAPITA CO₂ EMISSIONS IN SELECTED COUNTRIES

Metric tons per person per year from burning fossil fuels

The United States emits more CO₂ per person than most other countries in the world. (US Energy

Information Agency, International Energy Statistics, 2011)

option 2: prepare and protect our communities

We should protect and prepare communities for the effects of climate change. *BUT*, this does little to slow climate change and some will have to make larger sacrifices than others.

Examples of What Could Be Done

Some Trade-Offs to Consider

Upgrade storm-water systems, levees, and emergency water-supply systems, and build roads and transit above flood levels.

This will change the landscape in many communities and does not guarantee adequate protection.

Provide care, treatment, and assistance in the face of prolonged heat stress, hunger, homelessness, and other issues.

Local organizations might not be sufficient for caring for people impacted by climate-related events.

Use zoning, building codes, relocation, and insurance rules to keep people from living and building in vulnerable areas.

This would infringe on property rights and impose larger economic burdens on some property owners.

Make communities more self-sufficient by building independent power grids and creating strong local agricultural production.

Local self-sufficiency may not be possible everywhere, including where winters make it difficult to produce enough food.

Offer farmers subsidies and technical support for switching to crops and farming methods that can withstand climate changes.

Subsidies to farmers could be seen as unfair by other industries affected by climate change.



- ! Heat waves, poor air quality, health-related problems
- Tractor Declines in farm, livestock, and/or fisheries production
- Water drop Increased competition for water
- Wave Rising sea levels, flooding, heavier storm surges, coastal property damage, and habitat loss
- Tree Reductions or changes in wildlife habitat
- Wave Lower snowpack, deeper droughts
- Fire Worsening wildfires
- Water drop Heavy rains, alternating with longer, deeper droughts
- Gear Economic disruptions and infrastructure problems
- Wave Declines in hydropower production
- Magnifying glass Increased water-borne, pest-transmitted, or shellfish-borne diseases

CLIMATE-CHANGE THREATS BY REGION

Climate change poses threats to every part of the country. This map shows the impacts for which each region will need to prepare. (National Climate Assessment, Global Change Information

System, 2014)

option 3: accelerate innovation

We must invest in rapid innovation to develop new, cleaner fuel sources, new ways to influence Earth's climate, and even new societal arrangements. *BUT* we may not make progress quickly enough to avert the worst climate-change impacts, and some new ventures will fail or cause other environmental problems.

Examples of What Could Be Done

Offer companies incentives for developing technologies that help build a low-carbon economy.

Strengthen development of geoengineering—scientific methods for modifying Earth's climate.

Ease regulatory processes to bring new "green" technologies to the market more quickly.

Give businesses and nongovernmental organizations wider latitude to direct research at American universities.

Use technologies like "smart" electric meters and GPS devices, combined with peer pressure and social media, to encourage people to reduce energy use.

Some Trade-Offs to Consider

The government would be interfering in the private sector.

The outcomes and negative consequences of geoengineering are unknown.

Some harmful new technologies may slip through the cracks if we loosen our standards.

Businesses and organizations could "buy" research and unduly influence America's academic institutions.

This raises privacy and security concerns, and could lead to inappropriate public pressure.

A FUTURE POWERED BY SOLAR AND WIND: 2030 Electricity Cost and CO₂ Emissions Compared to 2012

NOAA researchers used a sophisticated simulator to show that renewable energy can be employed on a large scale and at a reasonable cost in the United States. By 2030, a cost-optimized power system that emphasizes wind and solar, along with natural gas, hydroelectric, and nuclear power, could significantly cut CO₂ emissions from generating power with only a small increase in electricity costs. (MacDonald et al.,

"Future Cost-Competitive Electricity Systems and Their Impact on US CO₂ Emissions," *Nature Climate Change*, January 2016)

