Climate Solutions

"Drawdown" is the future point in time when levels of greenhouse gases in the atmosphere stop climbing and start to steadily decline. It's a critical turning point for life on this planet, and we can reach it only by stopping heat-trapping emissions *and* supporting nature's carbon sinks, which draw carbon back down to Earth. According to Project Drawdown, the world could reach drawdown by midcentury using the solutions listed here—all of which are already in hand today. They are grouped into their sectors and subgroups, rather than ranked by impact, because an entire ecosystem of solutions is critical (* indicates that a solution falls into more than one sector). This list is extensive but not exhaustive and continues to grow. For more on these climate solutions and accelerators, see *The Drawdown Review* and drawdown.org.

1. Reduce Sources—*Bringing Emissions to Zero*

Electricity

Enhance Efficiency

- Insulation *
- High-performance glass *
- Dynamic glass *
- Green and cool roofs *
- Smart thermostats *
- Building-automation systems *
- LED lighting
- District heating *
- High-efficiency heat pumps *
- Solar hot water *
- Low-flow fixtures *
- Water-distribution efficiency

Shift Production

- Concentrated solar power
- Distributed solar photovoltaics

- Utility-scale solar photovoltaics
- Micro wind turbines
- Onshore wind turbines
- Offshore wind turbines
- Geothermal power
- Small hydropower
- Ocean power
- Biomass power
- Nuclear power
- Waste-to-energy *
- Landfill methane capture *

Enhance Efficiency and Shift Production
- Building retrofitting *
- Net-zero buildings *

Improve the System
- Distributed energy storage
- Utility-scale energy storage
- Grid flexibility
- Microgrids

Food, Agriculture, and Land Use

Address Waste and Diets
- Plant-rich diets *
- Reduced food waste *

Protect Ecosystems
- Forest protection *
- Indigenous peoples' forest tenure *
- Grassland protection *
- Peatland protection and rewetting *
- Coastal wetland protection *

Shift Agriculture Practices
- Conservation agriculture *
- Regenerative annual cropping *
- Nutrient management

- Farm irrigation efficiency
- Improved rice production *
- System of rice intensification *
- Sustainable intensification for smallholders *

Industry

Improve Materials
- Alternative cement
- Bioplastics

Use Waste
- Composting
- Recycling
- Recycled paper
- Waste-to-energy *
- Landfill methane capture *
- Methane digesters *

Address Refrigerants
- Refrigerant management *
- Alternative refrigerants *

Transportation

Shift to Alternatives
- Walkable cities
- Bicycle infrastructure
- Electric bicycles
- Carpooling
- Public transit
- High-speed rail
- Telepresence

Enhance Efficiency
- Hybrid cars
- Efficient trucks
- Efficient aviation
- Efficient ocean shipping

Electrify Vehicles
- Electric cars
- Electric trains

Buildings

Enhance Efficiency
- Insulation *
- High-performance glass *
- Dynamic glass *
- Green and cool roofs *
- Smart thermostats *
- Building automation systems *
- Low-flow fixtures *

Shift Energy Sources
- District heating *
- High-efficiency heat pumps *
- Solar hot water *
- Biogas for cooking
- Improved clean cookstoves

Enhance Efficiency and Shift Energy Sources
- Building retrofitting *
- Net-zero buildings *

Address Refrigerants
- Refrigerant management *
- Alternative refrigerants *

2. Support Sinks—*Uplifting Nature's Carbon Cycle*

Land Sinks

Address Waste and Diets
- Plant-rich diets *
- Reduced food waste *

Protect and Restore Ecosystems
- Forest protection *
- Indigenous peoples' forest tenure *

- Temperate forest restoration
- Tropical forest restoration
- Grassland protection *
- Peatland protection and rewetting *

Shift Agriculture Practices
- Conservation agriculture *
- Regenerative annual cropping *
- Managed grazing
- Silvopasture
- Multistrata agroforestry
- Tree intercropping
- Perennial staple crops
- Perennial biomass production
- Improved rice production *
- System of rice intensification *
- Sustainable intensification for smallholders *

Use Degraded Land
- Abandoned farmland restoration
- Tree plantations (on degraded land)
- Bamboo production

Coastal and Ocean Sinks

Protect and Restore Ecosystems
- Coastal wetland protection *
- Coastal wetland restoration

Engineered Sinks

Remove and Store Carbon
- Biochar production

3. Improve Society—*Fostering Equality for All*

Health and Education

- Universal access to high-quality education and reproductive healthcare

Accelerators—*To Move Solutions Forward*

1. Shape culture
2. Build power
3. Set goals
4. Alter rules and policy
5. Shift capital
6. Change behavior
7. Improve technology

Referenced Organizations

Many of the essays reference climate-focused organizations that readers may want to pursue further.

B Lab
Billion Oyster Project
Biomimicry Institute
California Environmental Justice Alliance
Carbon180
Center for Cultural Power
Chattahoochee RiverLands
Citizens' Climate Lobby
Climate Action Now
Climate Justice Alliance
Climate Reality Project
CREO
Deep South Center for Environmental Justice
Dogwood Alliance
Earthjustice
Earth Uprising
Emerge Puerto Rico
Extinction Rebellion
Fire Drill Fridays
500 Women Scientists
Giniw Collective
Global Migration Project
Greenpeace
GreenWave
Gulf Coast Center for Law & Policy
Harambee House
Indigenous Environmental Network
International Living Future Institute
League of Conservation Voters
Little Village Environmental Justice Organization
Louisiana Bucket Brigade
Louisiana Environmental Action Network
Moms Clean Air Force