

The New York Times

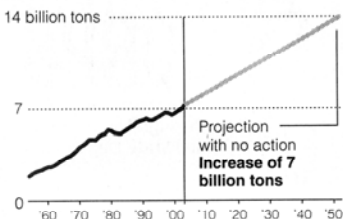
WORLD TRENDS

What Matters Most

Reducing human influence on the climate would require big changes in how energy for electricity and for transportation is produced and used. Here are a few of the options that many climate and energy experts put at the top of their lists for cutting heat-trapping emissions in the next 50 years, derived from recent Princeton University studies.

ANDREW C. REVKIN

ANNUAL CARBON* EMISSIONS

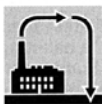


*3.67 tons of carbon dioxide contains 1 ton of carbon.

Top priorities

Seven steps industry and governments could take in the next 50 years, each of which would cut emissions by a billion tons.

CAPTURING CARBON DIOXIDE



SHORT TERM

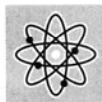
- When designing new coal-burning plants, **leave space for equipment** to be invented and installed later that could capture carbon dioxide.
- Scale up testing of existing plant designs that produce **streams of storable carbon dioxide**.

1 Capture 90 percent of the carbon dioxide from 800 new billion-watt coal-burning power plants.

LONG TERM

- Conduct large-scale tests of systems for **pressurizing and piping** carbon dioxide long distances.
- Test many more kinds of **geological formations** under continents and the sea to find repositories that can hold billions of tons of compressed carbon dioxide for centuries.
- Do more research on methods that might pull **carbon dioxide out of the air** instead of a power plant.

NUCLEAR POWER

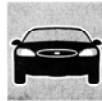


- Expand testing of safer, and more flexible, **reactor designs**.
- Intensify work on ways to safely **store waste and protect plants** from terrorists or other threats – vital if public support for nuclear power is to build.

2 Displace planned coal plants with about 880 new nuclear plants.

- Sustain and expand support for **research on fusion**, which remains a distant but potentially monumental prospect, as it has for decades.

TRANSPORTATION



- Raise **efficiency standards** for vehicles.
- Intensify research on **battery designs**.

3 The projected 2 billion cars on roads get 60 miles per gallon instead of 30.

4 Increase wind power 80-fold and use that energy to make hydrogen fuel for cars.

- Do basic work on the many steps involved in making **hydrogen** a climate-friendly fuel.
- Shift zoning, planning, and transportation strategies to encourage **clustered living** and alternatives to **single-passenger travel**.

ELECTRICITY

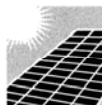


- Improve efficiency of **electricity generation and use** through a mix of tightening standards and increased public and private R.&D.

5 Raise the efficiency of 1,600 full size power plants that turn the energy locked in coal into electricity from 40 to 60 percent.

6 Cut 25% of electricity use in homes, offices and stores.

SOLAR POWER



- Create **more incentives** to expand use of existing solar power technologies.
- Expand existing **solar thermal power plants**, which use mirrors to concentrate the sun's heat and drive turbines.

7 The amount of electricity-generated using solar technologies is raised 700-fold.

- Expand research to find ways to sharply **cut the manufacturing cost** of photovoltaic cells and boost the amount of electricity they generate.

- Develop **efficient and cheap batteries** so that solar energy (and wind power) can be stored.

- Test systems that could harvest **solar energy in orbit** and beam it to earth in large volumes using microwaves.