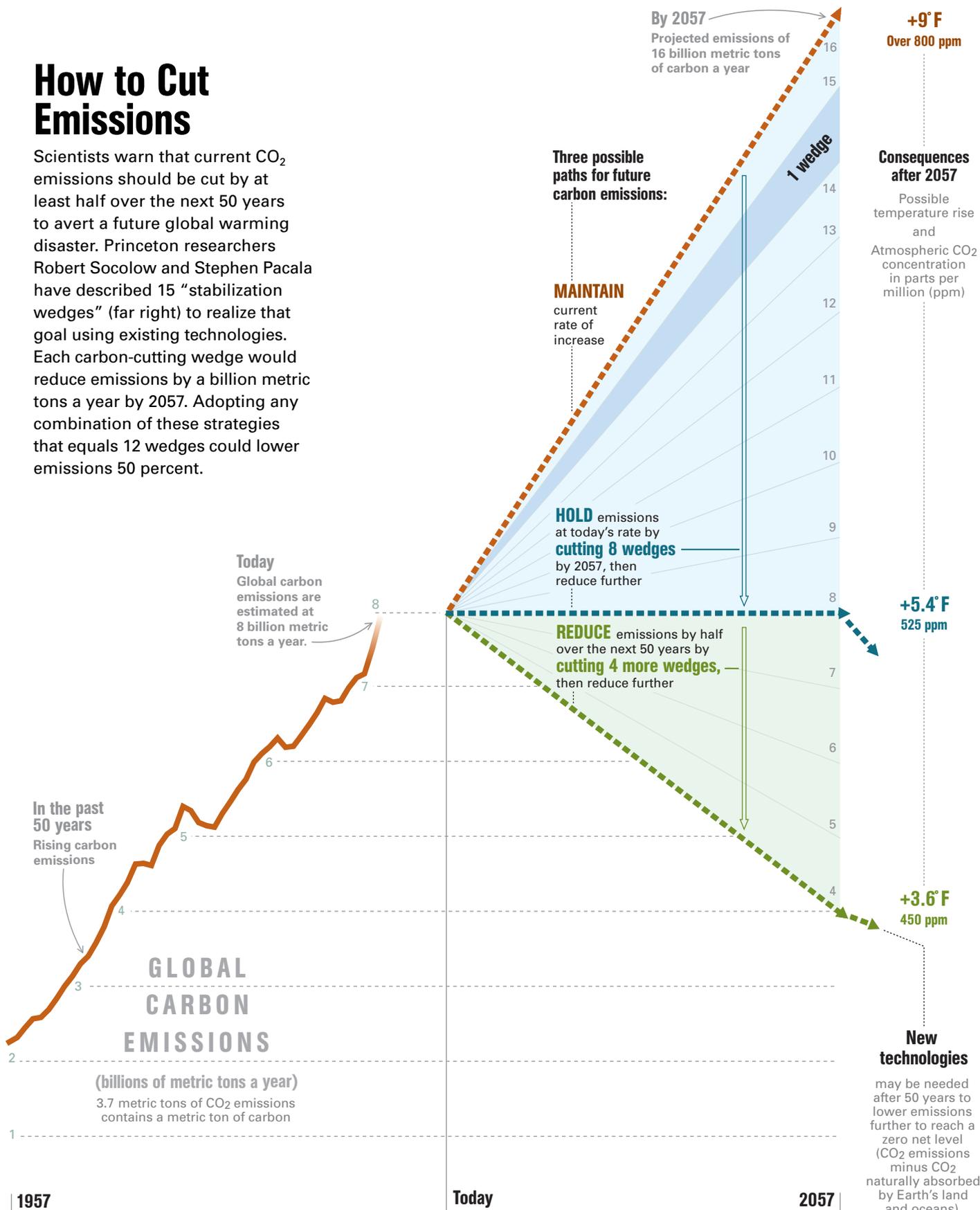


How to Cut Emissions

Scientists warn that current CO₂ emissions should be cut by at least half over the next 50 years to avert a future global warming disaster. Princeton researchers Robert Socolow and Stephen Pacala have described 15 “stabilization wedges” (far right) to realize that goal using existing technologies. Each carbon-cutting wedge would reduce emissions by a billion metric tons a year by 2057. Adopting any combination of these strategies that equals 12 wedges could lower emissions 50 percent.



ONE WEDGE AT A TIME

Each strategy listed below would, by 2057, reduce annual carbon emissions by a billion metric tons.



EFFICIENCY AND CONSERVATION

- Improve fuel economy of the two billion cars expected on the road by 2057 to 60 mpg from 30 mpg.
- Reduce miles traveled annually per car from 10,000 to 5,000.
- Increase efficiency in heating, cooling, lighting, and appliances by 25 percent.
- Improve coal-fired power plant efficiency to 60 percent from 40 percent.



CARBON CAPTURE AND STORAGE

- Introduce systems to capture CO₂ and store it underground at 800 large coal-fired plants or 1,600 natural-gas-fired plants.
- Use capture systems at coal-derived hydrogen plants producing fuel for a billion cars.
- Use capture systems in coal-derived synthetic fuel plants producing 30 million barrels a day.



LOW-CARBON FUELS

- Replace 1,400 large coal-fired power plants with natural-gas-fired plants.
- Displace coal by increasing production of nuclear power to three times today's capacity.



RENEWABLES AND BIOSTORAGE

- Increase wind-generated power to 25 times current capacity.
- Increase solar power to 700 times current capacity.
- Increase wind power to 50 times current capacity to make hydrogen for fuel-cell cars.
- Increase ethanol biofuel production to 50 times current capacity. About one-sixth of the world's cropland would be needed.
- Stop all deforestation.
- Expand conservation tillage to all cropland (normal plowing releases carbon by speeding decomposition of organic matter).