

Wedge Strategies Table

Electricity Production =  Heating and Direct Fuel Use =  Transportation =  Biostorage = 

Strategy	Category	Description	1 wedge could come from...	Cost	Challenges
1. Transportation Efficiency		Increase automobile fuel efficiency (2 billion cars)	... doubling the efficiency of all the world's cars from 30 to 60 mpg	\$	Car size and power
2. Transportation Conservation		Reduce miles traveled by passenger cars and trucks	... cutting miles traveled by all passenger vehicles in half	\$	Increased public transportation, urban design
3. Building Efficiency	 	Increase insulation, furnace and lighting efficiency	... using best available technology in all new and existing buildings	\$	House size, consumer demand for appliances
4. Electricity Efficiency		Increase efficiency of power generation	... raising plant efficiency from 40% to 60%	\$	Increased plant costs
5. CCS Electricity		CO ₂ from fossil fuel power plants captured then stored underground (700 large coal plants)	... injecting a volume of CO ₂ every year equal to the volume of oil extracted	\$\$	Possibility of CO ₂ leakage
6. CCS Hydrogen	 	Hydrogen fuel from fossil sources with CCS traps carbon dioxide	... producing hydrogen at a 10 times the current rate	\$\$\$	New infrastructure needed, hydrogen safety issues
7. Fuel Switching - Electricity	 	Replacing coal-burning electric plants with natural gas plants	... using an amount of natural gas equal to that used for all purposes today	\$	Natural gas availability
8. Nuclear Electricity		Displace coal-burning electricity plants with nuclear plants (2 x current capacity)	... ~ 3 times the effort France put into expanding nuclear power in the to 1980's, sustained for 50 years	\$\$	Weapons proliferation, nuclear waste, local opposition
9. Wind Electricity		Wind displaces coal-based electric (30 x current capacity)	... using area equal to ~3% of U.S. Land area for wind farms	\$\$	competing land use, location disputes
10. Solar Electricity		Solar PV displaces coal-based electricity (700 x current capacity)	... using the equivalent of a 100 km x 200 km PV array	\$\$\$	PV cell materials
11. Concentrated Solar Power (CSP)		Solar power displaces coal-based electricity	... CSP collectors and plants covering an area the size of 1/6 of California	\$\$\$	Requires lots of land, endangers some animals
12. Wind Hydrogen	 	Produce hydrogen with wind electricity	... powering half the world's cars with hydrogen	\$\$	infrastructure, safety, location disputes
13. Biofuels	 	Biomass fuels from plantations, replace petroleum fuels	... scaling up world ethanol production by a factor of 30	\$\$	Biodiversity, competing land use
14. Forest Storage		Carbon stored in new forests	... halting deforestation in 50 years	\$	competing land use, biodiversity
15. Soil Storage		Farming techniques increase carbon retention or storage in soils	... using conservation tillage on all agricultural soils	\$	Reversed if land is deep-plowed later

CCS = Carbon Capture and Storage

PV = Photovoltaic

mpg = miles per gallon