Solving Global Warming and Oil Dependence Together



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Jakobshavn Ice Stream in Greenland

Discharge from major Greenland ice streams is accelerating markedly.

Source: Prof. Konrad Steffen, Univ. of Colorado NRDC



Failing to develop alternatives to conventional coal means missing a huge opportunity to avoid additional carbon lock-in.

The developing world in particular is scheduled to build huge amounts of new coal capacity. If advanced technologies are ready, ways can be found to get them used but if we delay, very large amounts of conventional capacity will be built.

According to IEA, about 250 GW of new coal will be built this decade; an additional 483 GW will be built in the next decade; and over 710 additional GW will be built between 2020-2030.

Some of this capacity can be avoided with efficiency investments and some by increasing use of renewable resources. But a substantial amount of new coal capacity is likely to be built. The question is what technology will be used.

We have missed the chance to influence technology choice for much of this decade. Failure to act now means we could miss the next decade as well.



Solutions

The Big Players:

- Energy Efficiency
- Renewable Energy
- CO₂ Capture & Geologic Storage





Carbon capture and storage. 325 MtC

Carbon capture and storage technology is applied to 180 GW of coal-fired integrated gasification combined cycle power plants. Additional carbon dioxide is captured from natural gas production facilities and large industrial sources. The total volume of carbon dioxide put into storage would be 25 times the volume currently used for enhanced oil recovery and would be equivalent to 4 times the annual flow of natural gas through buffer storage facilities.





Transport efficiency: cuts 475 MtC

- Passenger vehicles
 - 2050 fleet averages 54 mpg, not 24 mpg
 - Hybrids
 - Fuel cells
 - Conventional vehicle improvements
- Other transport efficiency
 - Trucks average 13 mpg, not 7 mpg
 - Aircraft average 105 smpg, not 80 smpg
 - Smart growth reduces travel by 10%



Renewable energy: cuts 325 MtC

- Wind
 - 30% of electricity generation
 - Requires 300,000 2 MW turbines
 - Land area of 25 million acres, multiple use
- Biofuels
 - 40 billion gallons
 - 30 million acres growing 12 tons biomass/acre
 - Area equal to Conservation Reserve set aside



CO₂ capture and storage: cuts 325 MtC

- Equip 180 GW of coal with CCS
 - 25 x current CO_2 use for EOR
 - 4 x current natural gas buffer storage flows
- Additional CCS at other stationary sources
 - Large industrial facilities
 - Natural gas production













This is a satellite image of the North Pole. The white area shows the extent of polar sea ice in 2005 and the red outline shows its extent in 1979. In less than 25 years polar sea ice has shrunk in area by more than 20% and its thickness has decreased by 40%. Scientists are sure that some of this loss is due to the impact of man-made climate change but probably won't be able to tell us how much for perhaps another 20 years. But if we wait that long to take serious action we will be in big trouble.