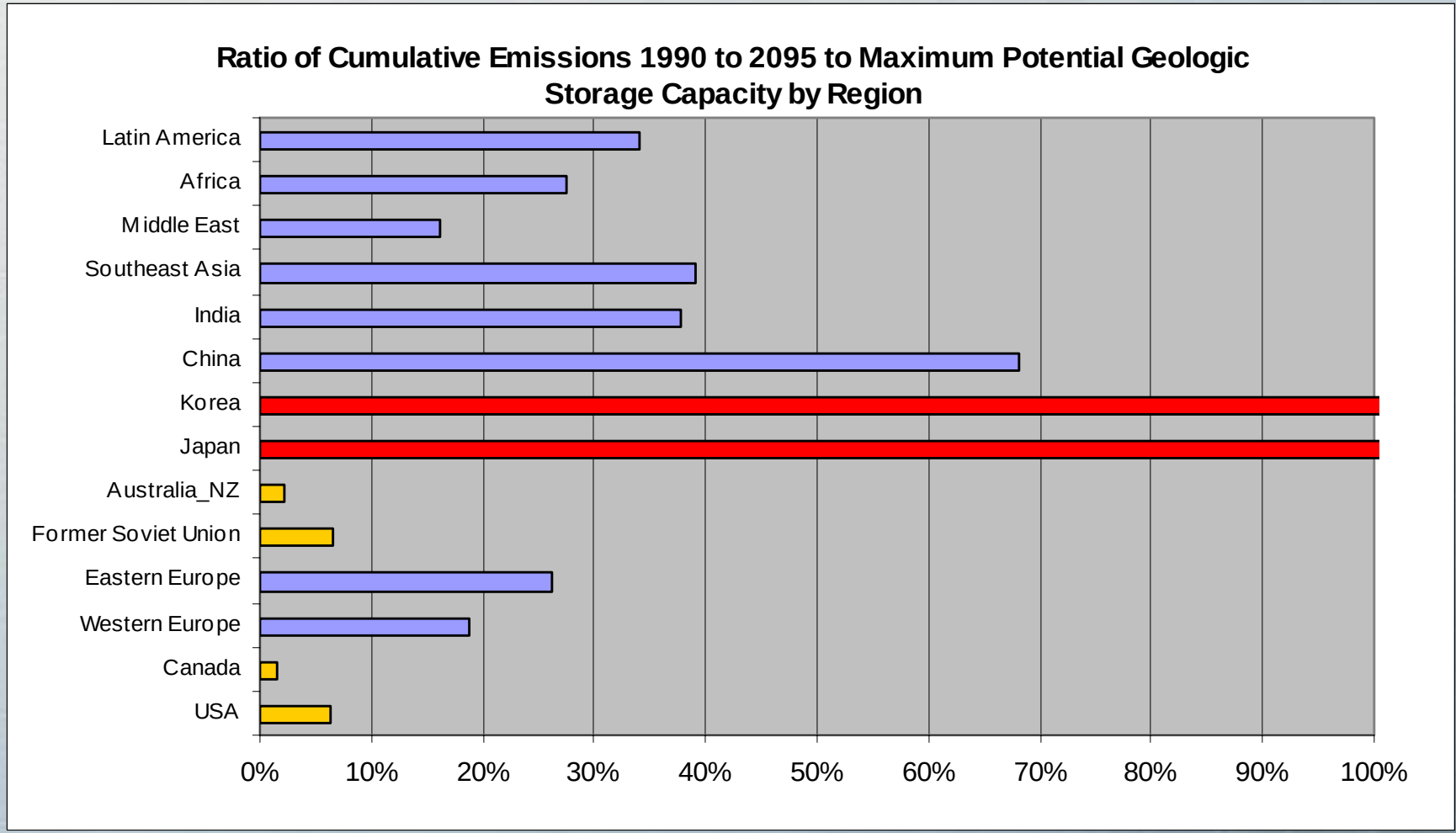
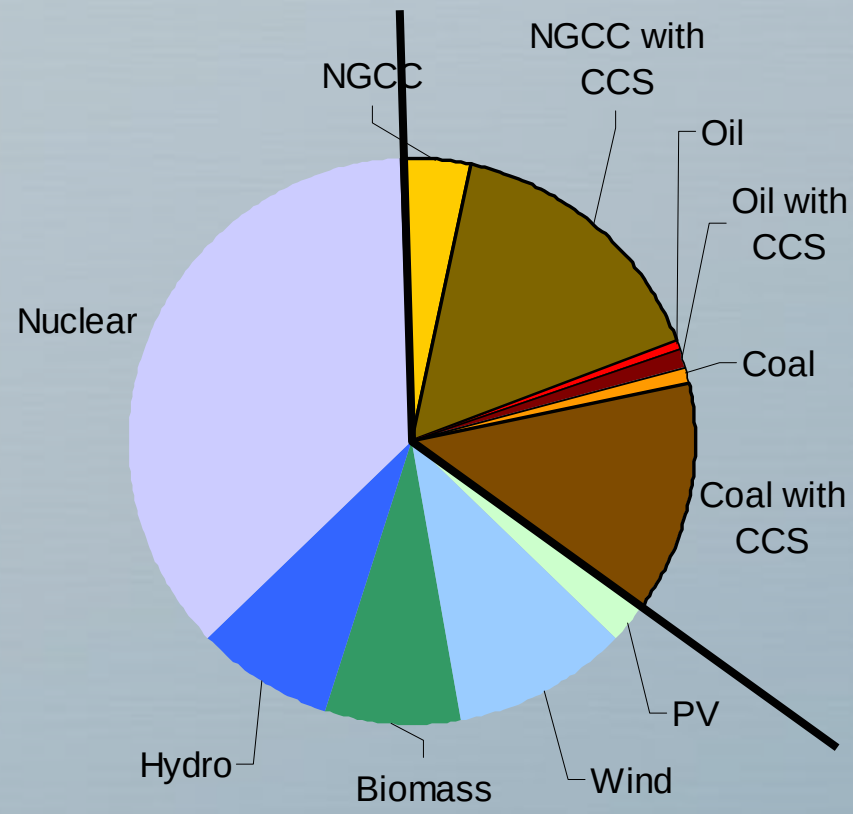
Global CO_2 Storage Capacity

A Very Heterogeneous Natural Resource

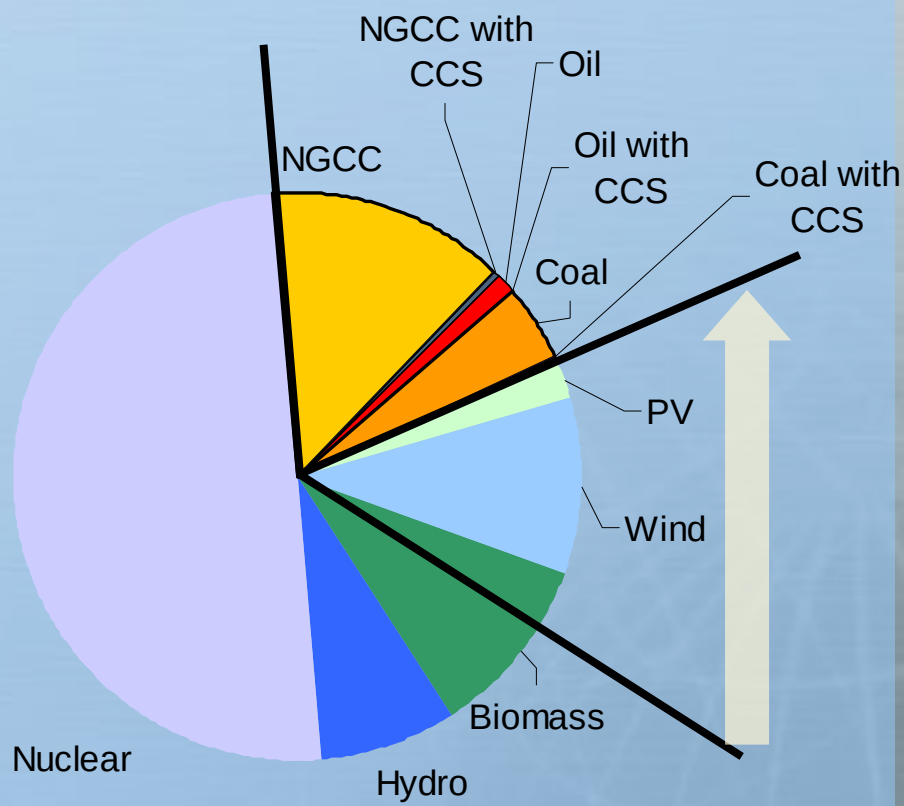


Composition of Power Generation in Japan, 2095

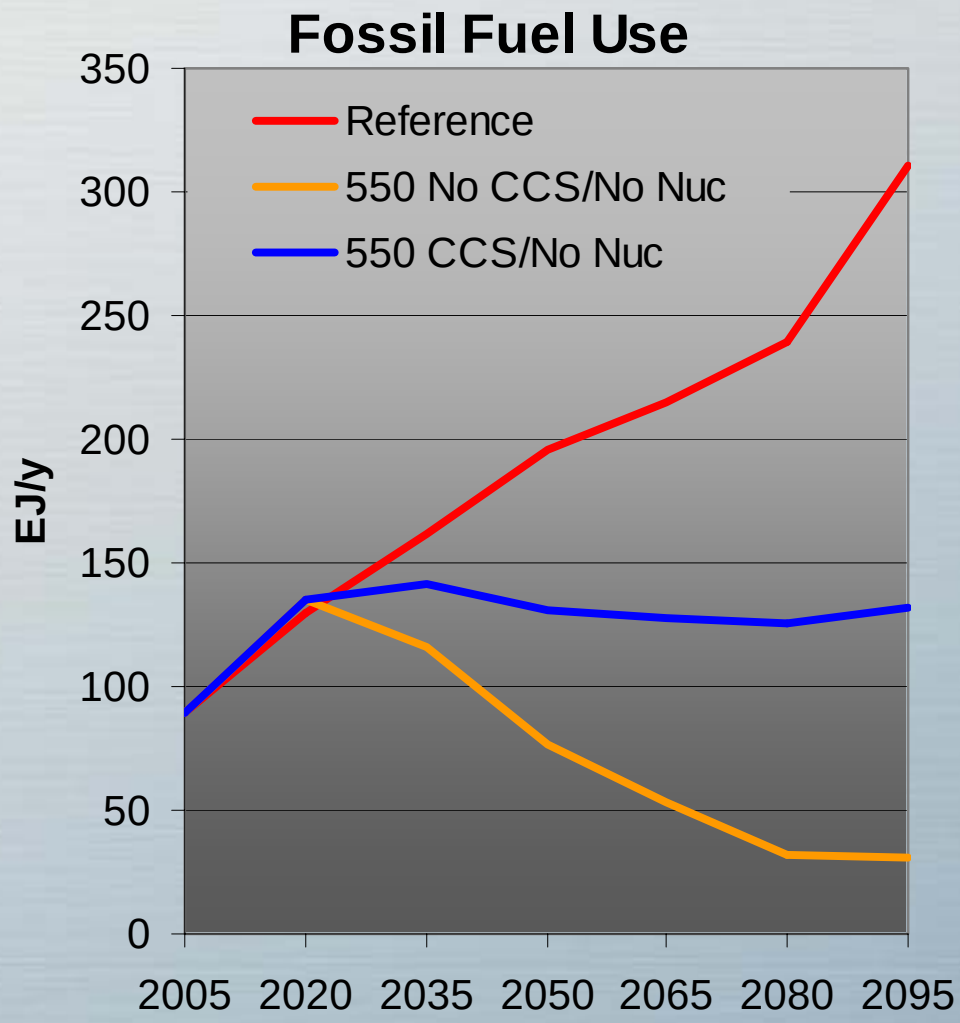


Regionally unlimited CCS assumed available, 550 ppm

Regionally limited CCS available 550 ppm



Carbon-Constrained Future
With and Without Large-Scale CCS Deployment



No CCS

- Economic forces push coal out of the market in the coming decades.
- Higher energy prices

CCS Allowed to Deploy to Its Full Potential

Preserves economic and energy security benefits of fossil fuels

- **Lowers the cost of energy relative to "no CCS" scenario**
- A portfolio of energy technologies achieves stabilization goal
- **Reduces the cost of stabilization by up to trillions of dollars.**

GTSP Global Energy Technology Strategy Program

Battelle *The Business of Innovation*

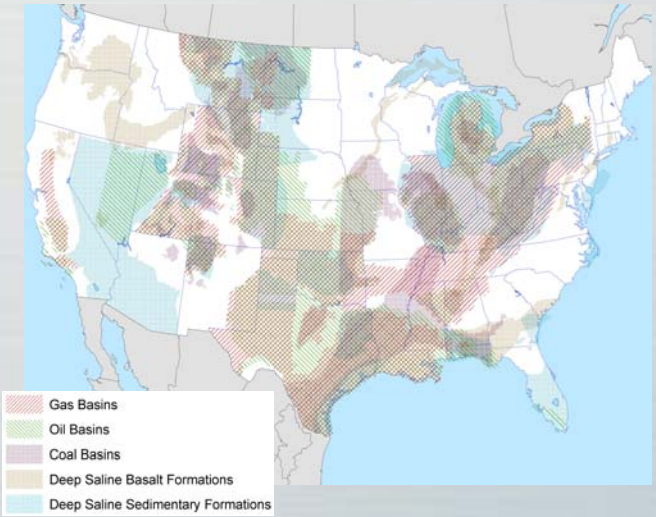
CCS Deployment

Today and 2050 (on 550 ppmv path)

Cumulative Global 2005-2050 CCS Deployment 30,000 $MtCO_2$

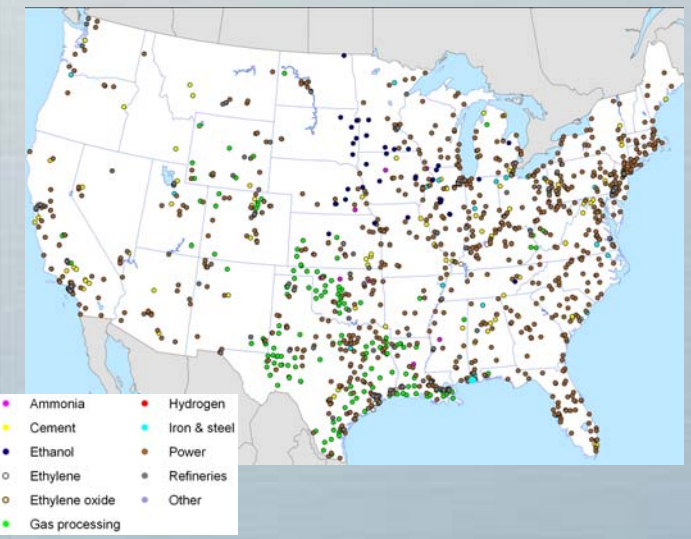
Cumulative USA (2005-2050) CCS Deployment 8,000 $MtCO_2$

A Large CO_2 Storage Resource and a Large Potential Demand for CO_2 Storage Across a Number of Economic Sectors



3,900+ $GtCO_2$ Capacity within 230 Candidate Geologic CO_2 Storage Reservoirs

- 2,730 $GtCO_2$ in deep saline formations (DSF) with perhaps close to another 900 $GtCO_2$ in offshore DSFs
- 240 Gt CO2 in on-shore saline filled basalt formations
- 35 $GtCO_2$ in depleted gas fields
- 30 $GtCO_2$ in deep unmineable coal seams with potential for enhanced coalbed methane (ECBM) recovery
- 12 $GtCO_2$ in depleted oil fields with potential for enhanced oil recovery (EOR)



1,715 Large Sources (100+ $ktCO_2/yr$) with Total Annual Emissions = 2.9 $GtCO_2$

- 1,053 electric power plants
- 259 natural gas processing facilities
- 126 petroleum refineries
- 44 iron & steel foundries
- 105 cement kilns
- 38 ethylene plants
- 30 hydrogen production
- 19 ammonia refineries
- 34 ethanol production plants
- 7 ethylene oxide plants