Overcoming Barriers to CCS Deployment

CSLF Plenary Session

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Monday, 26 March 2007

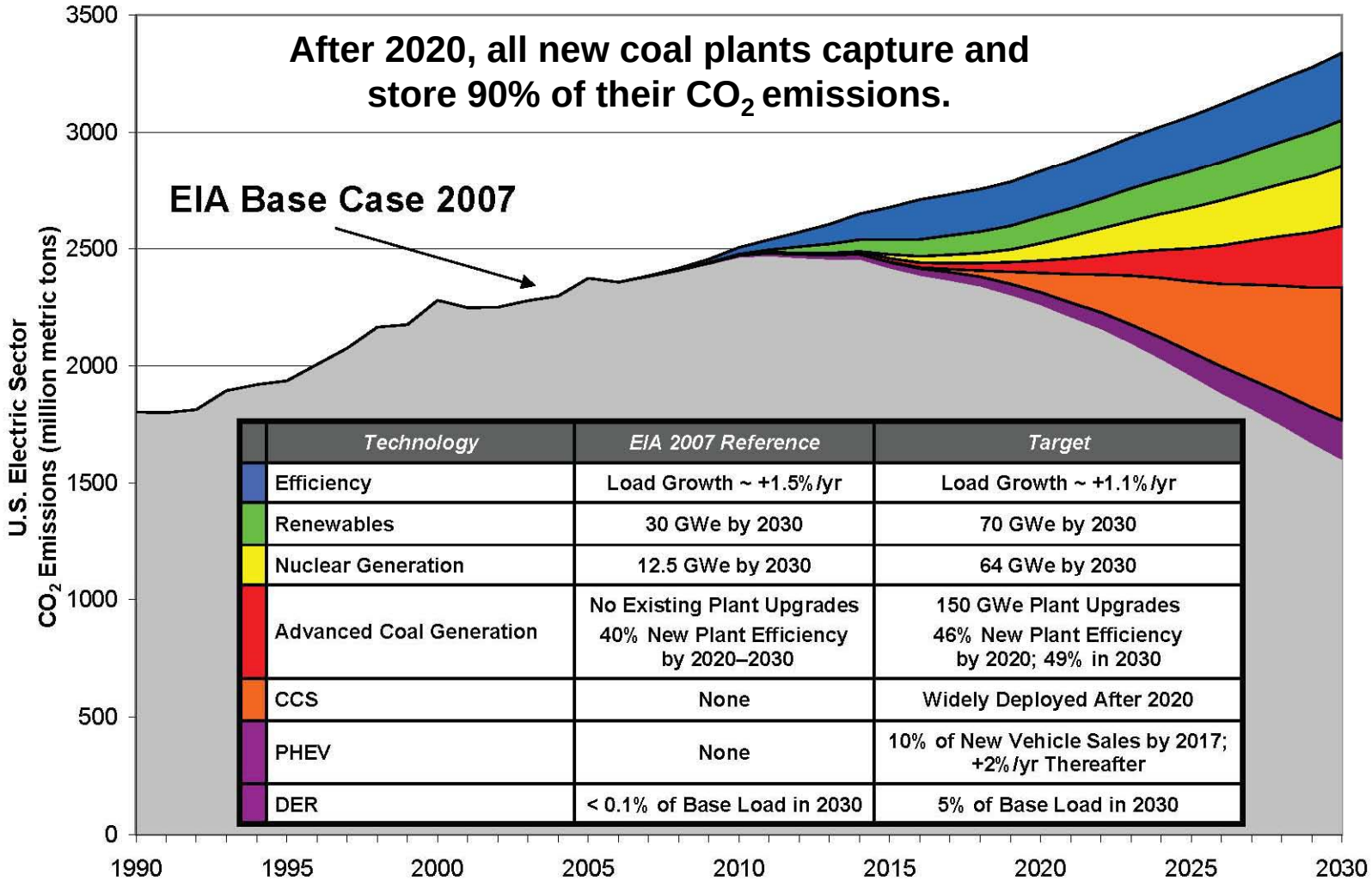
Technology Deployment Targets

Technology	*EIA 2007 Base Case*	*EPRI Analysis Target**
Efficiency	Load Growth ~ +1.5%/yr	Load Growth ~ +1.1%/yr
Renewables	30 GWe by 2030	70 GWe by 2030
Nuclear Generation	12.5 GWe by 2030	64 GWe by 2030
Advanced Coal Generation	No Existing Plant Upgrades 40% New Plant Efficiency by 2020–2030	150 GWe Plant Upgrades 46% New Plant Efficiency by 2020; 49% in 2030
Carbon Capture and Storage (CCS)	None	Widely Available and Deployed After 2020
Plug-in Hybrid Electric Vehicles (PHEV)	None	10% of New Vehicle Sales by 2017; +2%/yr Thereafter
Distributed Energy Resources (DER) *(including distributed solar)*	< 0.1% of Base Load in 2030	5% of Base Load in 2030

* EPRI analysis targets do not reflect costs or regulatory and siting constraints. Additional economic modeling in progress.

Source: Electric Power Research Institute

CO_2 Reductions … What's Technically Feasible



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** Achieving all targets is very aggressive, but potentially feasible*

EPRI ELECTRIC POWER RESEARCH INSTITUTE

The Challenge

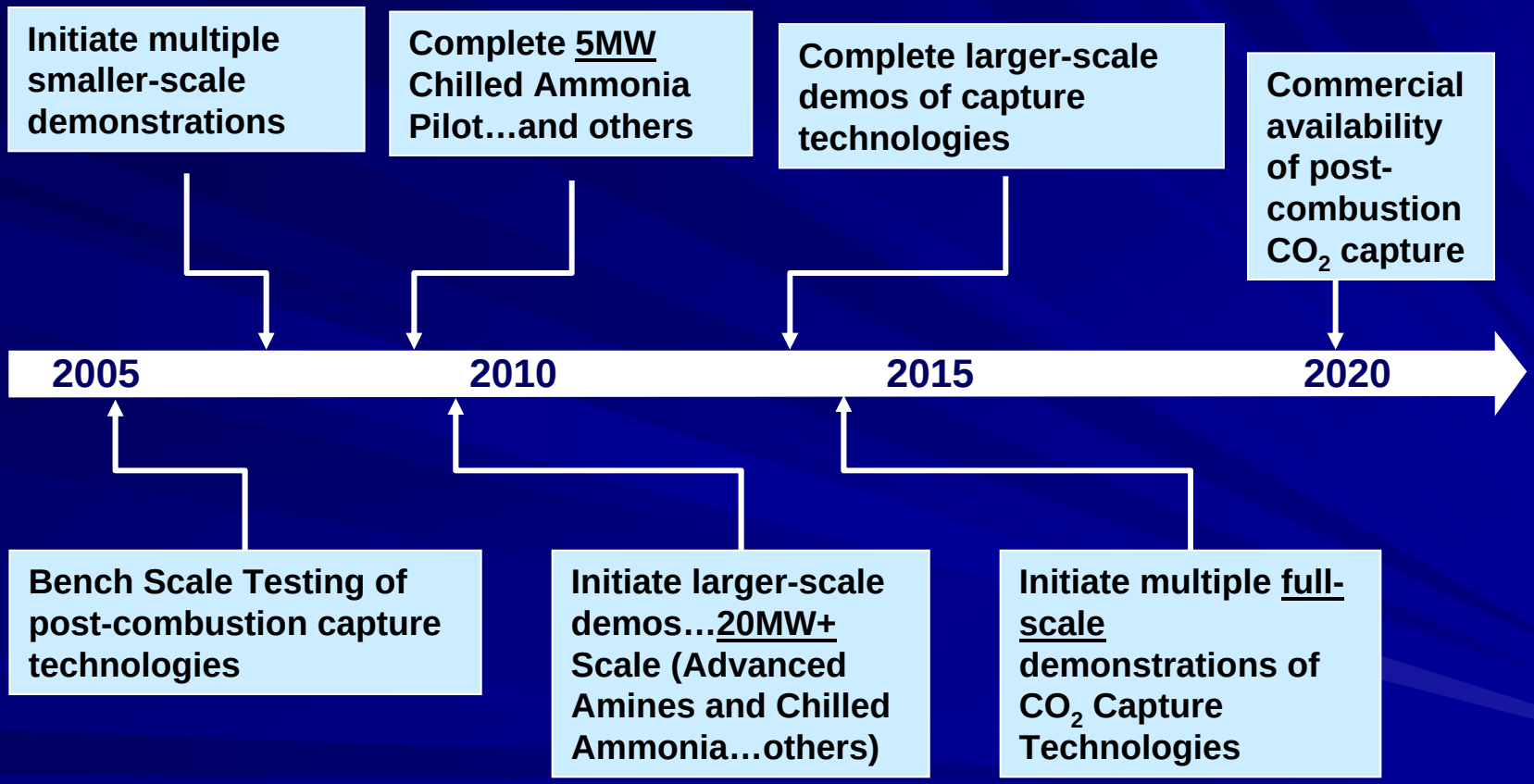
- US: Equivalent of five hundred 500 MW coal plants
- One 500 MW coal plant produces 3 million tons/year of CO_2
- US produces 1.5 billion tons/year of CO_2 from coal plants
- If all this CO_2 were transported:
  - 3 times the weight
  - 1/3 the annual volume of natural gas transported by US pipelines
- Largest sequestration project is 1 million tons/year at Sleipner gas field

Source: “The Future of Coal” M.I.T. study

Barriers

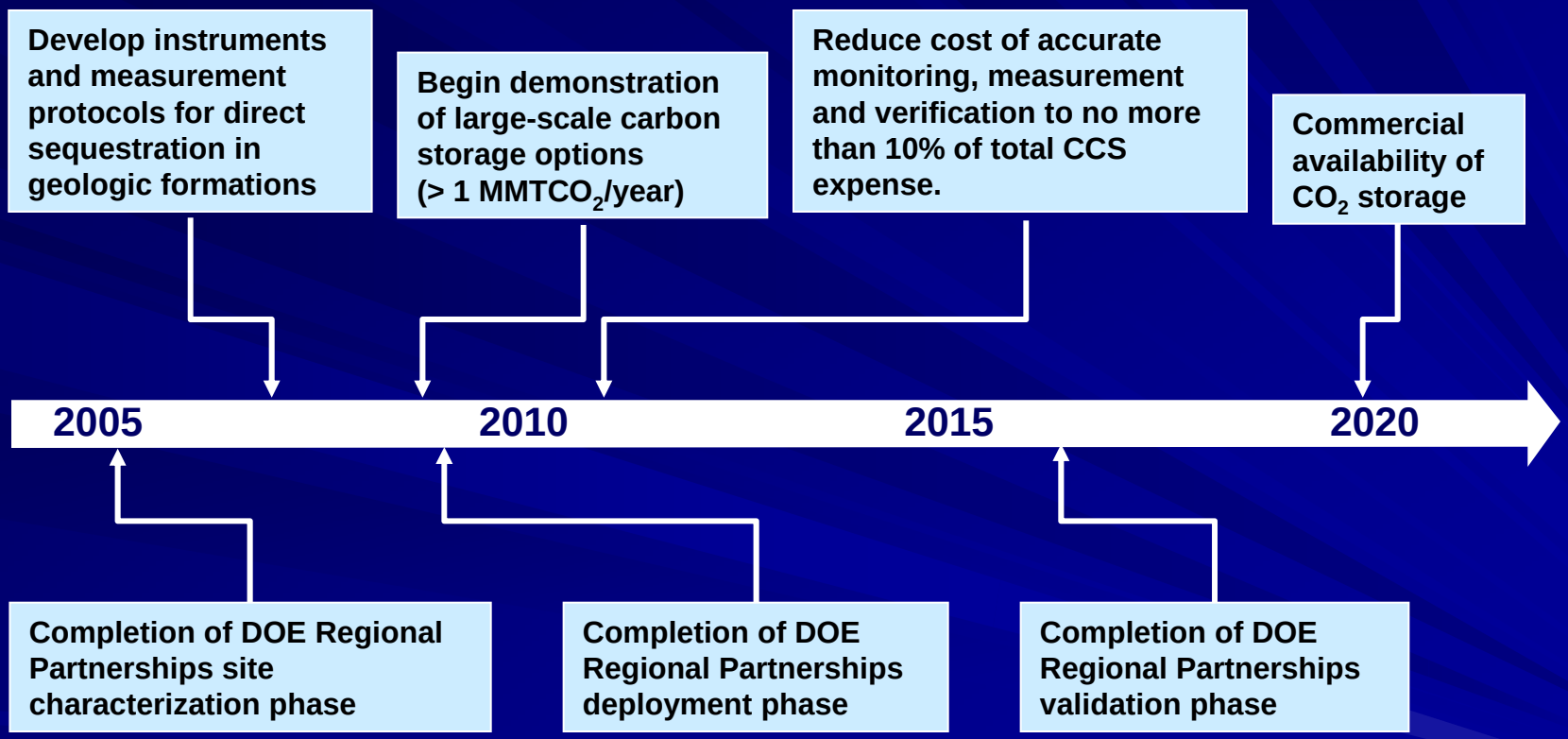
- Public Understanding and Acceptance
- Cost
- Regulatory and Legal Issues
  - Permitting
  - Transport
  - Storage
  - Potential Liability
- Long Timeline

Timeline:
Post-Combustion Capture (PC Plant)



Sources: Electric Power Research Institute, DOE-NETL Carbon Sequestration R&D Roadmap Modified to add Chilled Ammonia example

Timeline: CO_2 Storage



Sources: Electric Power Research Institute, DOE-NETL Carbon Sequestration R&D Roadmap

What's Needed

- Technology
  - Funding Mechanisms
- Market Mechanisms
- Public Understanding and Acceptance