



U.S. DEPARTMENT OF
ENERGY

Office of
Fossil Energy



U.S. Federal Coal Policy Initiatives *Positioning Coal-Fired Generation for the Future*

Clean Coal Day in Japan 2018 International Symposium
September 11, 2018

Lou Hrkman

Deputy Assistant Secretary
Clean Coal and Carbon Management

Trump Administration's energy goals

The President's America First Energy Plan calls for strong domestic energy production, energy security at home, a commitment to revitalizing coal, and expand global markets for American energy resources

- "...committed to energy policies that lower costs for hardworking Americans and maximize the use of American resources"
- "The Trump Administration is also committed to clean coal technology, and to reviving America's coal industry"
- "We must take advantage of the estimated \$50 trillion in untapped shale, oil, and natural gas reserves, especially those on federal lands that the American people own. We will use the revenues from energy production to rebuild our roads, schools, bridges and public infrastructure"
- "Protecting clean air and clean water, conserving our natural habitats, and preserving our natural reserves and resources will remain a high priority"
- "President Trump is committed to eliminating harmful and unnecessary policies"



Regulatory initiatives – Presidential actions

- **Executive Order 13777** (82 FR 12285, March 1, 2017) on Enforcing the Regulatory Reform Agenda directs federal agencies to establish a Regulatory Reform Task Force
- **Executive Order 13771** (82 FR 9339, February 3, 2017) on Reducing Regulation and Controlling Regulatory Costs. It directs agencies that the “total incremental costs of all regulations should be no greater than zero” in Fiscal Year (FY) 2017
- **Executive Order 13783** (82 FR 16093, March 31, 2017) on Promoting Energy Independence and Economic Growth, directs the Environmental Protection Agency (EPA) to review existing regulations, orders, guidance documents and policies that potentially burden the development or use of domestically produced energy resources



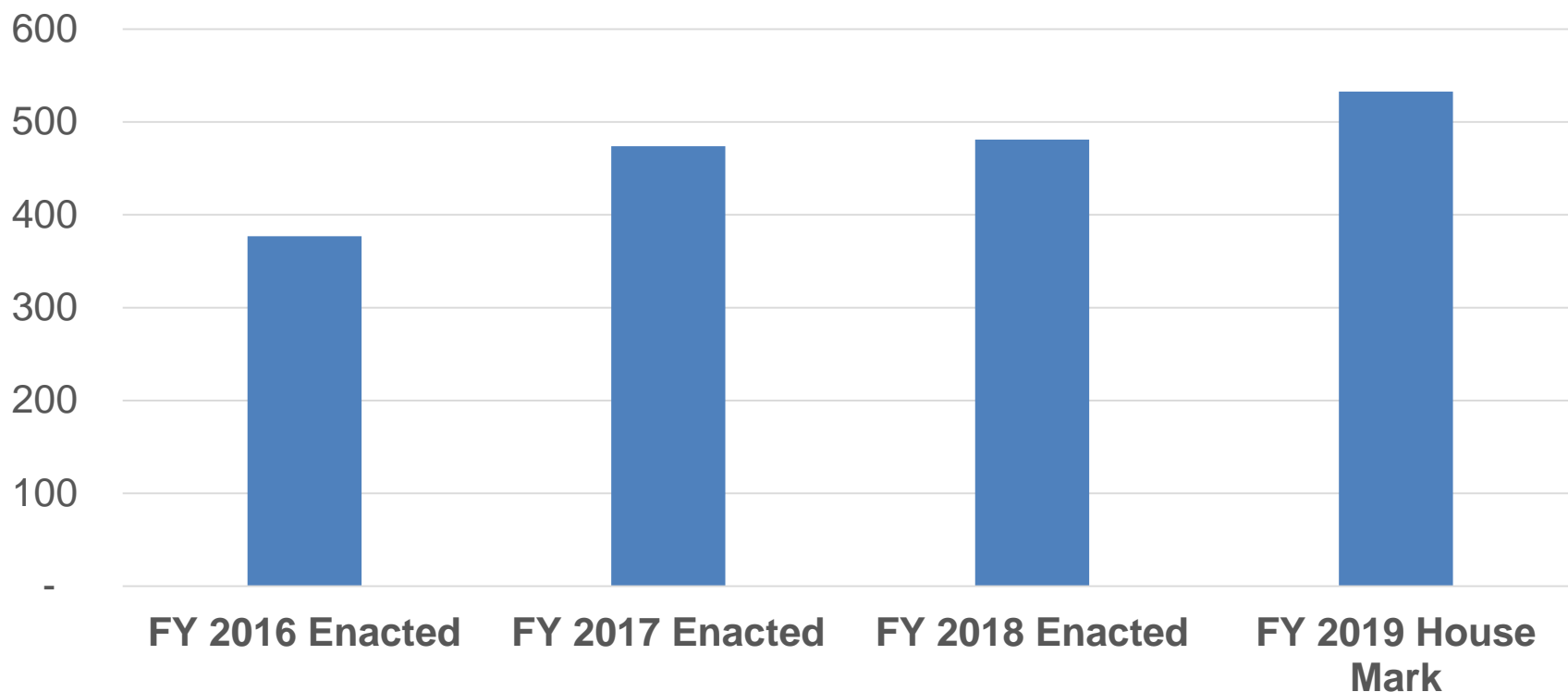
Regulatory initiatives – federal agency actions

- Federal agencies under the Trump Administration have revoked or are in the process of reversing more than 60 environmental regulations that effect the coal industry
- Key EPA actions affecting coal-fired power plants:
 - Proposed **Affordable Clean Energy (ACE) Rule** to replace the Clean Power Plan (CPP): shifting greenhouse gas regulatory authority back to states; modified EPA’s New Source Review (NSR) requirements to encourage on-site efficiency upgrades
 - Clarified **NSR preconstruction permitting requirements**: EPA will not “second guess” companies’ emission projections as long as they comply with EPA’s procedural requirements of a preconstruction analysis
 - Withdrew “**Once In Always In**” policy: new guidance allows a “major source” of emissions to be reclassified as an “area source” so that it will no longer be subject to requirements for major sources, as long as the facility limits its potential to emit below major source thresholds
 - Revisiting the **Regional Haze Rule** and rulemaking regarding **Coal Combustion Residuals** and **Waters of the United States**



Federal support for clean coal and carbon management research and development (R&D)

million US dollar



Clean coal and carbon management: R&D overview

Discover and develop advanced coal technologies that ensure America's access to and use of secure, affordable, and reliable fossil energy resources

Advancing R&D for the existing coal fleet

Advancing R&D for plants of the future

Reducing the Cost of Capture

Creating New Markets for Coal

Advanced Energy Systems

Crosscutting Research

CO₂ Capture and Utilization

CO₂ Storage

Efficiency improvements for new and existing units

- High performance materials
- Solid oxide fuel cells
- Modular design
- Advanced cycles e.g. sCO₂
- Advanced Turbines
- Advanced Combustion
- Sensors and controls
- Power Generation Efficiency

Crosscutting technology development program

- Water management
- Critical Mineral extraction from coal and coal byproducts
- Modeling, simulations and analysis
- University research

Reducing the cost of CO₂ capture for new and existing units

- Post-combustion capture
- Pre-combustion capture
- New pathways to utilize captured CO₂

Safely and permanently storing CO₂

- Safe use and permanent storage of CO₂ from power generation and industry
- Minimizing subsurface risks (coordinated with other subsurface offices, i.e., Oil and Gas)
- CO₂ infrastructure

Note: Programmatic not necessarily budgetary groupings



Small-scale modular coal plant of the future



Benefits

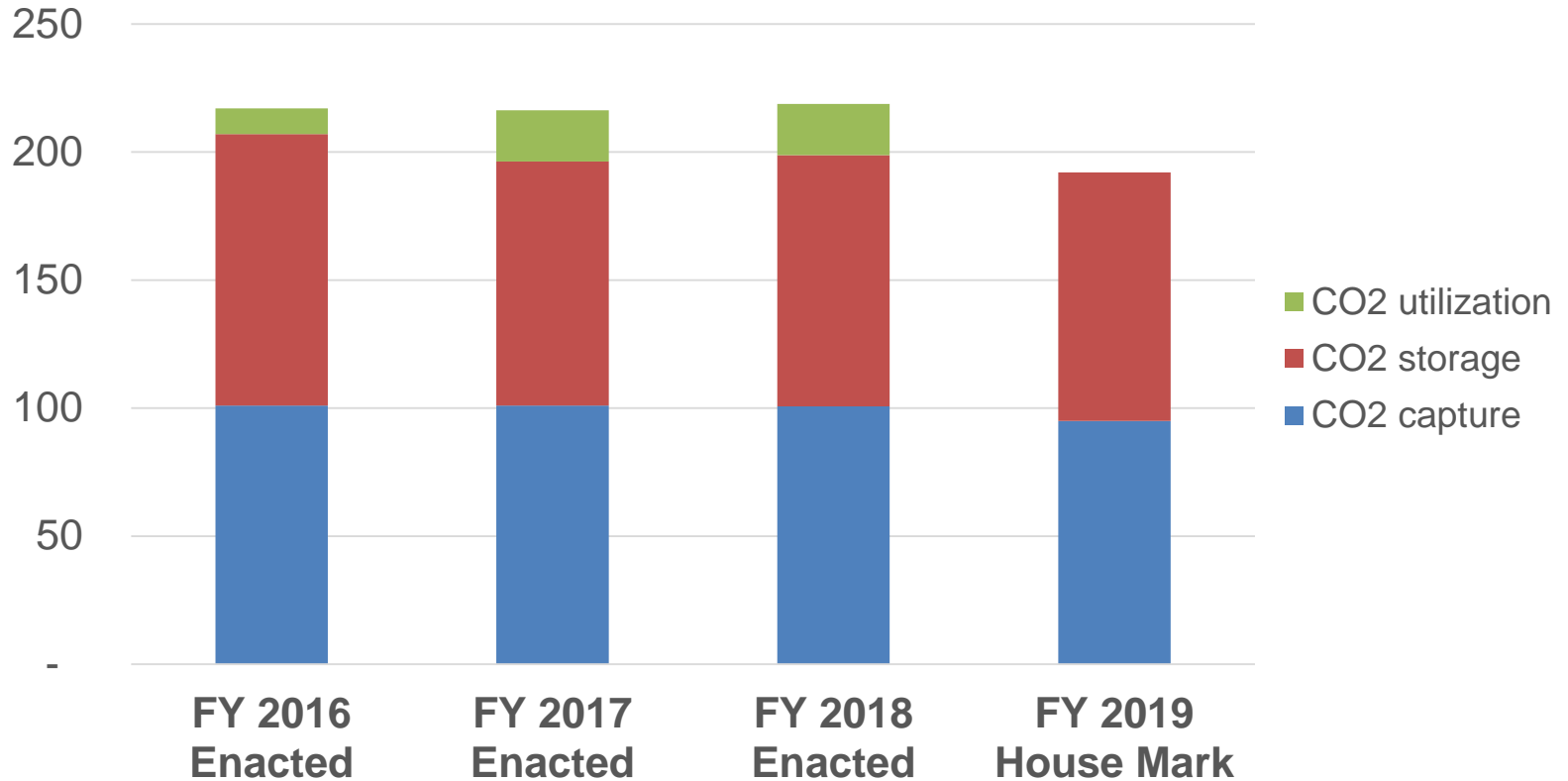
- Modular power plants can be created from “**building blocks**”
- **Pre-constructed** systems only need to be connected to other systems
- Smaller component size **simplifies transportation**

Challenges

- Limited size and operating conditions of products made via **Additive Manufacturing (AM)**; lack of designs using AM products
- **Modeling tools** are still in early development
- **Advanced technologies** need development (heat management, microwaves, biomass co-feeding, biological creation of hydrogen may be ideal for modular systems)

Federal support for carbon capture, utilization and storage (CCUS) R&D – budget and appropriations

million US dollar



Financial incentives for industry to adopt CCUS – tax credits

- “Technology push” through R&D is matched with “market pull” through financial incentives
 - Tax benefits defined in “45Q” for qualified CCUS projects have been available since 2008
 - The February 2018 “Bipartisan Budget Act of 2018” extended and significantly expanded the tax benefits:
 - **Increased the credit amount:**
\$20/ton → up to \$50/ton, 10/ton → up to \$35/ton, depending on the handling of captured CO₂
 - **Expanded the qualified carbon oxides** to include carbon monoxide (CO)
 - **Expanded qualified uses** to include CO₂ utilization other than enhanced oil or natural gas recovery
 - **Lowered the qualifying threshold** for the amount of CO₂ captured to allow more industries to participate in the program
 - **Increased the flexibility** to allow credit assignment to capture or disposal facility
 - **Removed the program cap**
- Industry has responded quickly and positively

