



NATIONAL ENERGY TECHNOLOGY LABORATORY



Tracking New Coal-Fired Power Plants

National Energy Technology Laboratory

Office of Systems Analyses and Planning
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Tracking New Coal-Fired Power Plants

This report is intended to provide an overview of proposed new coal-fired power plants that are under development. This report may not represent all possible plants under consideration but is intended to illustrate the potential that exists for installation of new coal-fired power plants.

Recent experience has shown that public announcements of new coal-fired power plant development do not provide an accurate representation of actual new operating power plants. Actual plant capacity commissioned has historically been significantly less than new capacity announced.

The report focuses on those power plant projects that have achieved significant progress toward completion, to provide a more accurate assessment of the ability of this segment of the power generation industry to support demand for new electricity capacity in various regions of the United States.

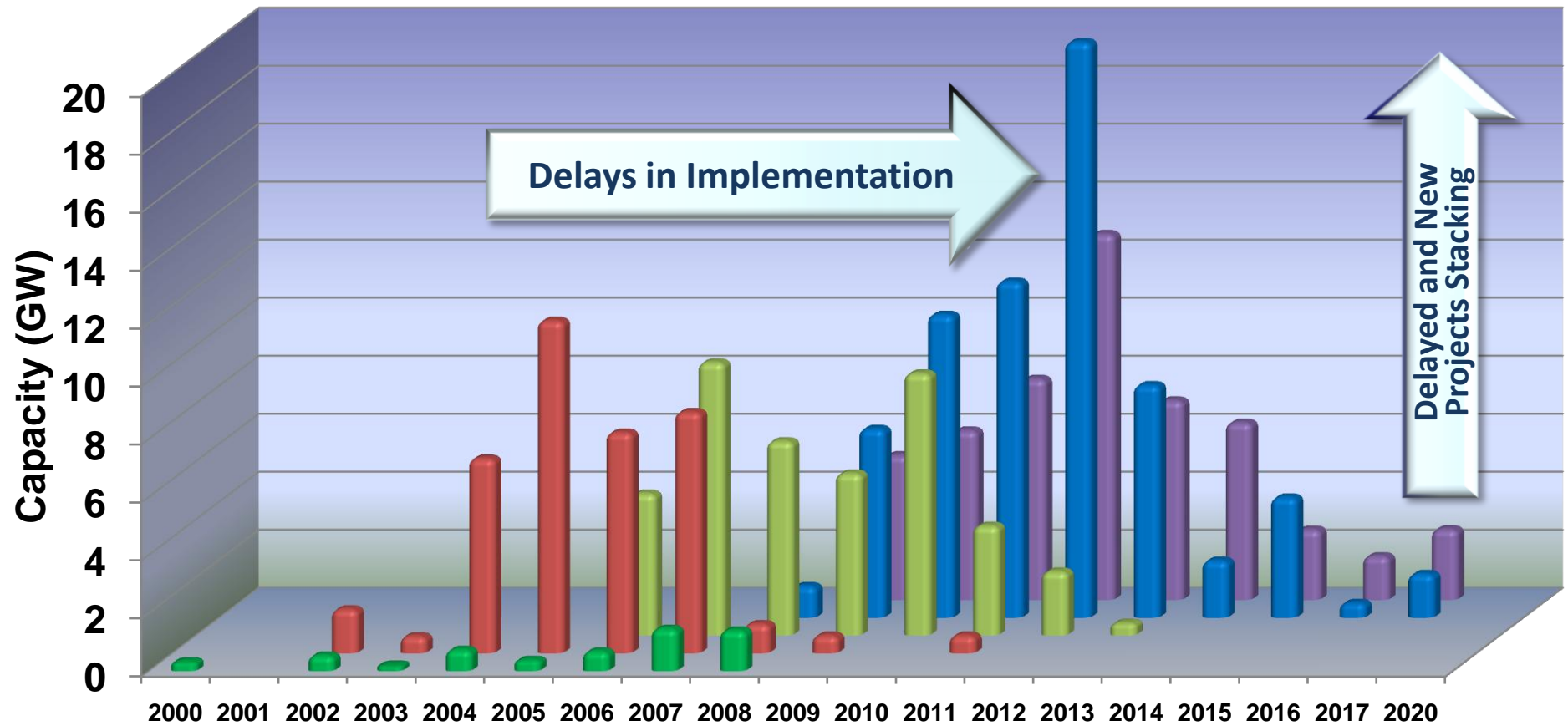
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Tracking New Coal-Fired Power Plants

- **This report provides a perspective of coal-fired power plants that are currently under development, with a focus on those having made significant progress toward achieving commercial operation**
- **The status of projects in development varies from project announcements to those under construction**
- **Announced projects that are canceled before or during the permitting phase are not unusual; announced projects are not necessarily strong indicators of capacity additions**
- **Plants that are permitted or under construction reflect a developer's significant financial commitment to completion and offer a better perspective of the new generation capacity that may be forthcoming**

Past Capacity Announcements vs. Actual

Figure 1



Historically, actual capacity has been shown to be significantly less than proposed capacity. For example, the 2002 report listed 11,455 MW of proposed capacity for the year 2005 when actually only 329 MW were constructed.

■ Actual
 ■ 2002 Report
 ■ 2005 Report
 ■ 2007 Report
 ■ 2009 Report

Historic Capacity Additions by Years

Refer to Figure 1

- **Actual plant capacity, commissioned since 2000, has been far less than new capacity announced; the year 2002 report of announcements reflected a schedule of over 36,000 MW to be installed by 2007, whereas \approx 4,500 MW (12%) were achieved**
- **The trend over several years has reflected the bulk of power plant developments shifting out in time due to project delays**
- **Delays and cancelations have been attributed to regulatory uncertainty (regarding climate change) or strained project economics due to escalating costs in the industry**
- **New announcements combined with delayed projects have tended to increase the backlog of plants in the queue**
- **Cancellations become more prevalent as prospects of fulfilling all projects in the queue become impractical**

Current Coal-Fired Capacity Projects

Table 1

		Number of Plants			Capacity (MW)		
General Status		January 2009	April 2009	Net Change	January 2009	April 2009	Net Change
Progressing Projects	Under Construction	28	27	-1	16,319	16,054	-265
	Near Construction	7	6	-1	2,812	2,562	-250
	Permitted	13	10	-3	7,000	3,620	3,380
	SUB TOTAL	48	43	-5	26,131	22,236	-3,895 (-15%)
Uncertain Potential and Timing	Announced (early stages of development)	47	44	-3	31,869	28,637	-3,232 (-10%)
	TOTAL	95	87	-8	58,000	50,873	-7,127 (-12%)
	Operational this Period	-	1	+1	-	278	+278
	TOTAL (with Operational)			-7			-6,849 (-13%)

Status Listing	Description
Under Construction	Project is under construction.
Near Construction	Project has been approved; majority or all permits are obtained. Sponsor is contracting vendors and Engineering, Procurement and Construction (EPC) contractors. Site preparation has begun.
Permitted	In the permitting phase. Two or more permits approved or fuel or power contracts have been negotiated.
Announced	Early stages of development to filing for permits. May include a feasibility study.

Source: Ventyx – Velocity Suite
Data collected 1/5/2009 and 4/6/2009

Current Capacity Additions by Years

Refer to Table 1

- Table 1 reflects the current status of coal-fired plant development activity as of April 6, 2009 and the 1st quarter (*January 5, 2009 through April 6, 2009*)
- “Progressing” plants are projects with status indicating permitted, near construction, or under construction
- “Progressing” plants have attained a higher likelihood of advancing toward commercial operation; however, regulatory uncertainty and industry cost increases are impacting development decisions for all projects
- The 278 MW Hugh L Spurlock (Kentucky) plant has been removed from the tally and is now operational
- There has been a net decrease of 3,895 MW (-15%) of “Progressing” projects for the 3 month period

Decrease in Capacity - Progressing Plants

Refer to Table 1

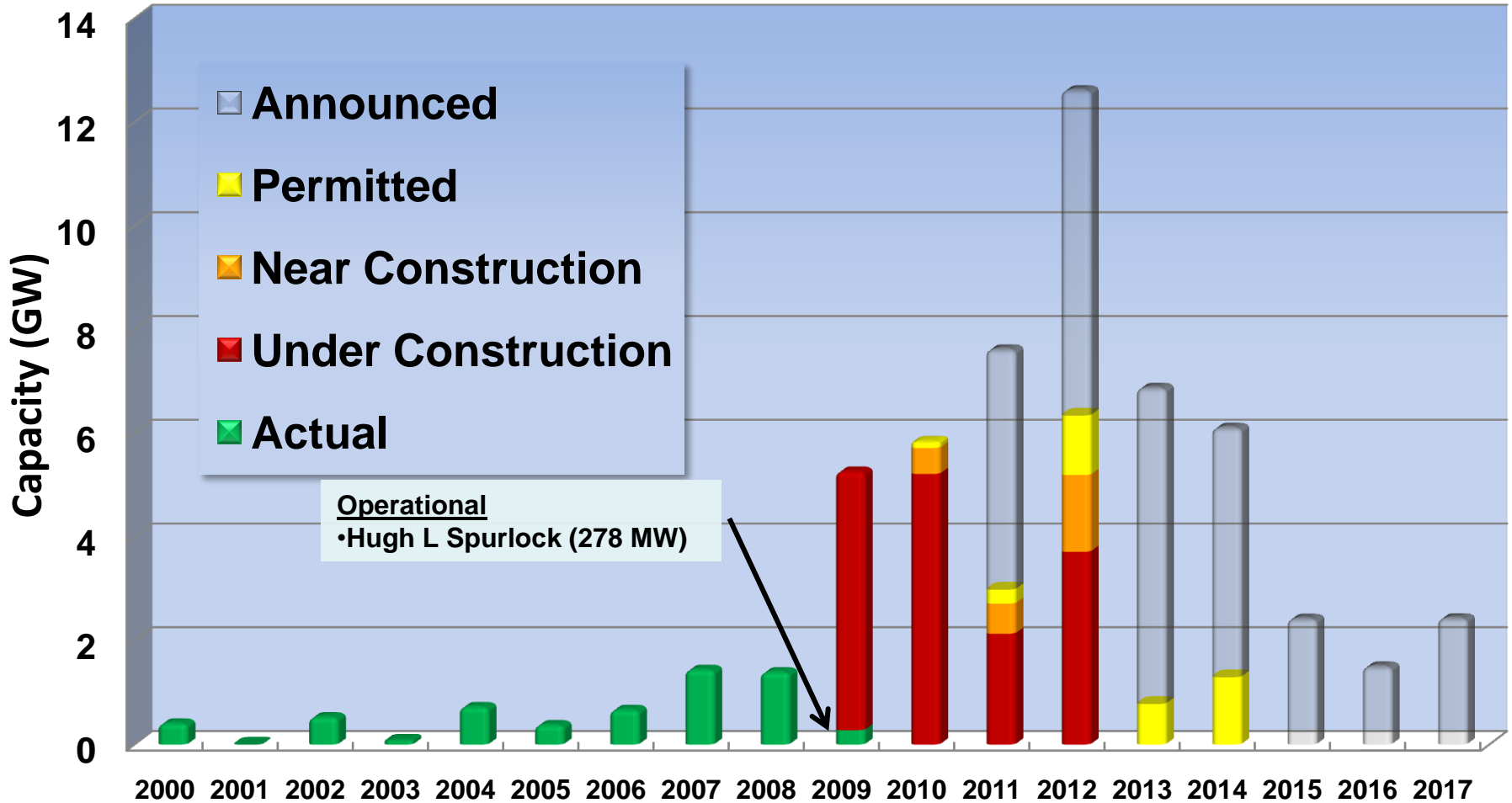
The decreased capacity (3,895 MW, 5 plants) in “Progressing” Plants was due to:

Proposed Plant	Capacity (MW)	Reason for Removal from Progressing Tally
Hugh L Spurlock	278	Status went from “Under Construction” to “Operational”. Operational plants are not included in the tally.
AMP Power	1,000	Status moved from “Permitted” to “Announced” – inadequate number of permits.
Pee Dee	660	Status moved from “Permitted” to “Announced” – inadequate number of permits.
Thoroughbred	1,500	Peabody Energy withdrew its application for an air quality permit. Peabody and ConocoPhillips will instead pursue a permit for a coal-to-gas plant at the same location.
Highwood	250	Southern Montana Electric stopped construction due to regulatory uncertainty. Instead, the company will pursue a natural gas-fired plant.

Remaining 207 MW due to changes or refinements in proposed nameplate capacities

Current Capacity Additions by Years

Figure 2



Actual

Operational Dates

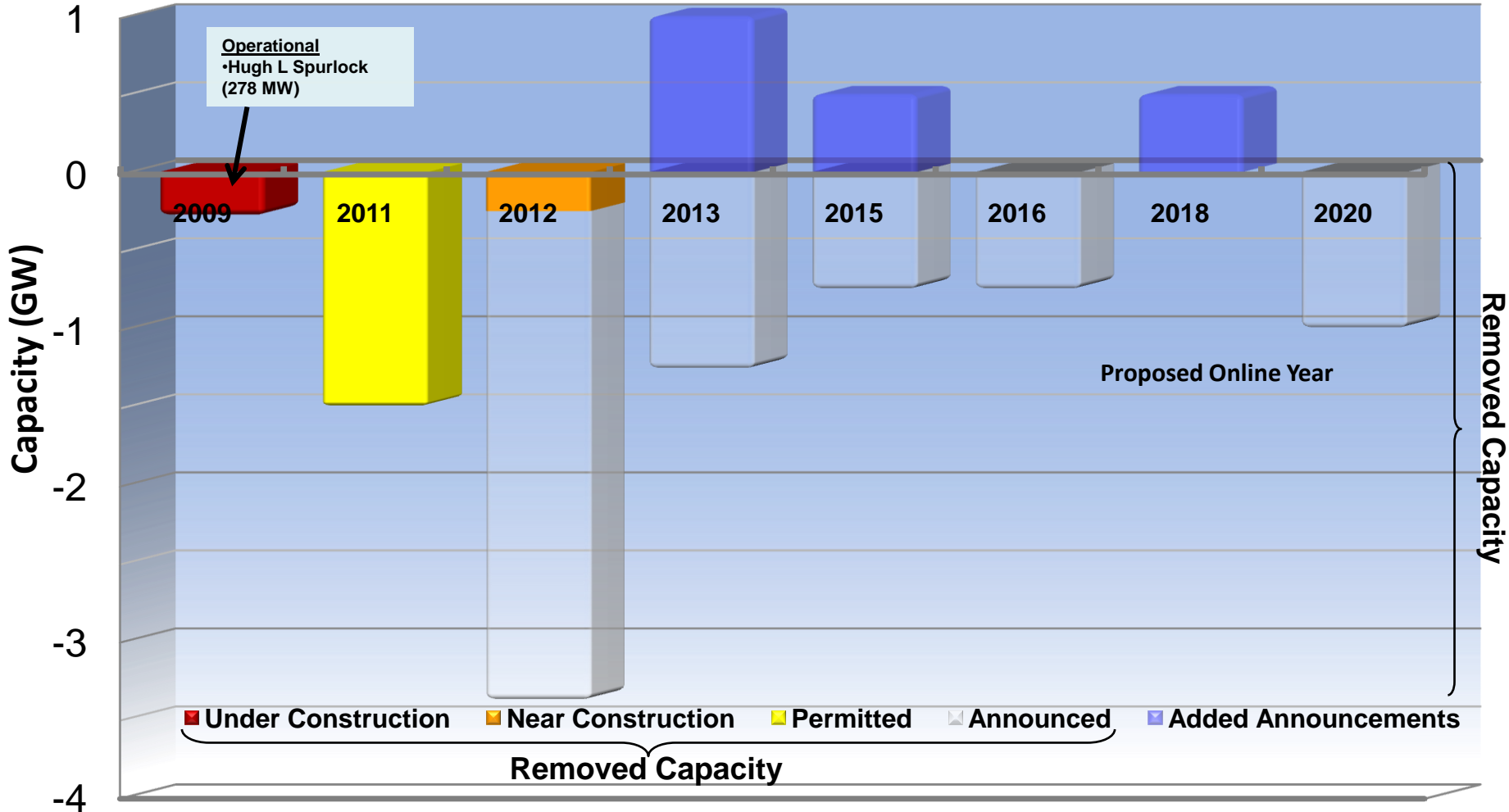
Proposed

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Net Capacity Changes (Removed and Added Opportunities)

Figure 3

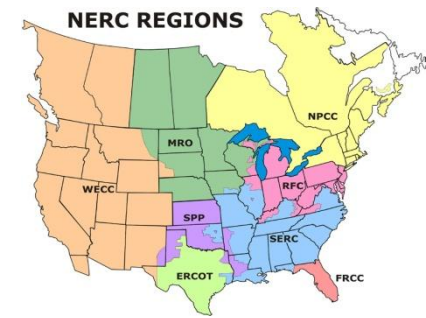
77% of MWs removed represent "Announced" projects
 0.5% of MWs removed due to Now Operating plants



Total Net Reductions (less operating) 6,838 MW (-13%)

Canceled Plant Implications

- **The projects removed from the list are predominately due to today's economic environment and regulatory uncertainty**
- **Announced projects that are canceled before or during the permitting phase are not unusual**
 - announced projects are not necessarily strong indicators of capacity additions
- **Delayed or abandoned projects still represent future opportunities**
 - Land, fuel, transportation, and water availability still exists
 - Specifically: Mine mouth opportunities and waste coal piles are still there



Proposed Capacity by NERC Regions

Table 2

NERC Region		Progressing Projects				Announced	Grand Total (less Operational)	Operational
		Under Construction	Near Construction	Permitted	Sub Total			
ASCC	Capacity (MW)	0	0	0	0	0	0	
	Plants	0	0	0	0	0	0	
ERCOT	Capacity (MW)	4,165	0	303	4,468	8,235	12,703	
	Plants	5	0	1	6	8	14	
FRCC	Capacity (MW)	0	0	750	750	0	750	
	Plants	0	0	1	1	0	1	
MRO US	Capacity (MW)	279	0	10	289	1,850	2,139	
	Plants	2	0	1	3	3	6	
NPCC	Capacity (MW)	0	0	125	125	40	165	
	Plants	0	0	1	1	1	2	
RFC	Capacity (MW)	3,140	1,142	1,375	5,657	4,856	10,513	
	Plants	4	3	3	10	9	19	
SERC	Capacity (MW)	4,065	500	677	5,242	7,941	13,183	278
	Plants	5	1	1	7	13	20	1
SPP	Capacity (MW)	2,715	600	0	3,315	0	3,315	
	Plants	6	1	0	7	0	7	
WECC	Capacity (MW)	1,690	320	380	2,390	5,715	8,105	
	Plants	5	1	2	8	10	18	
N/A	Capacity (MW)	0	0	0	0	0	0	
	Plants	0	0	0	0	0	0	
Total Sum Capacity (MW)		16,054	2,562	3,620	22,236	28,637	50,873	
Total Count of Plants		27	6	10	43	44	87	

Proposed Technologies of New Plants

(3 month period change)

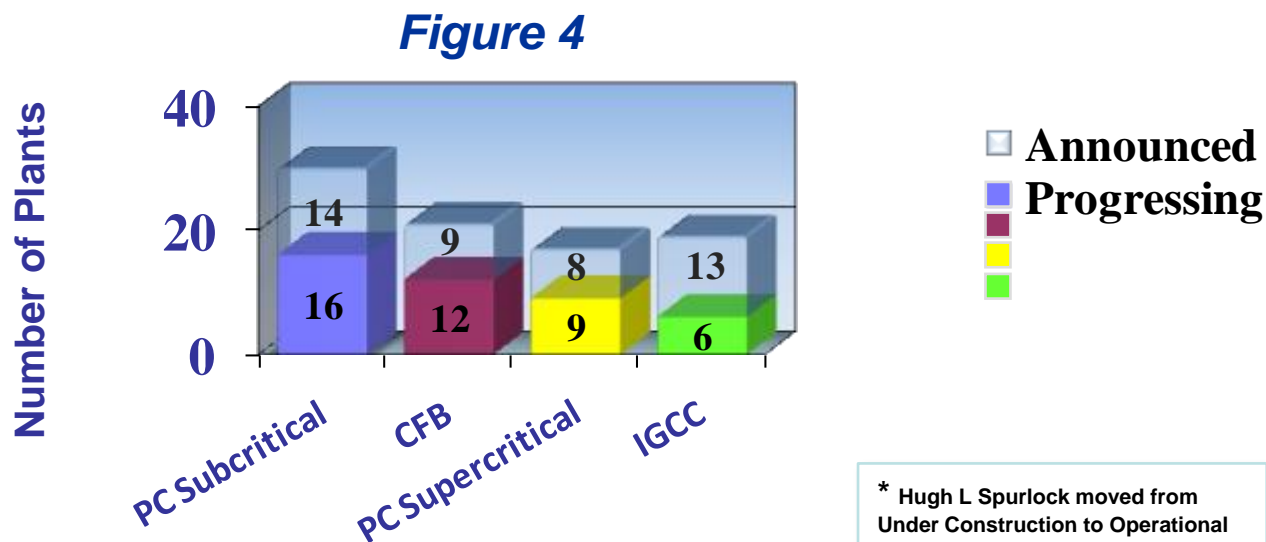


Table 3

Technology Listings	Operational (Since 2000)	Progressing (Permitted, Near-, and Under Construction)		Announced		Total Proposed	
		January 2009	Apr 2009 (Change)	January 2009	Apr 2009 (Change)	January 2009	Apr 2009 (Change)
PC Subcritical	14	18	16 (-2)	16	14 (-2)	34	30 (-4)
CFB	9*	14	12 (-2)*	10	9 (-1)	24	21 (-3)*
PC Supercritical	2	10	9(-1)+	8	8 (0)	18	17 (-1)
IGCC	1	6	6 (0)	13	13 (0)	19	19 (0)

Source: Ventyx – Velocity Suite

January Report data collected (1/5/2009); Current Report data collected (4/6/2009)

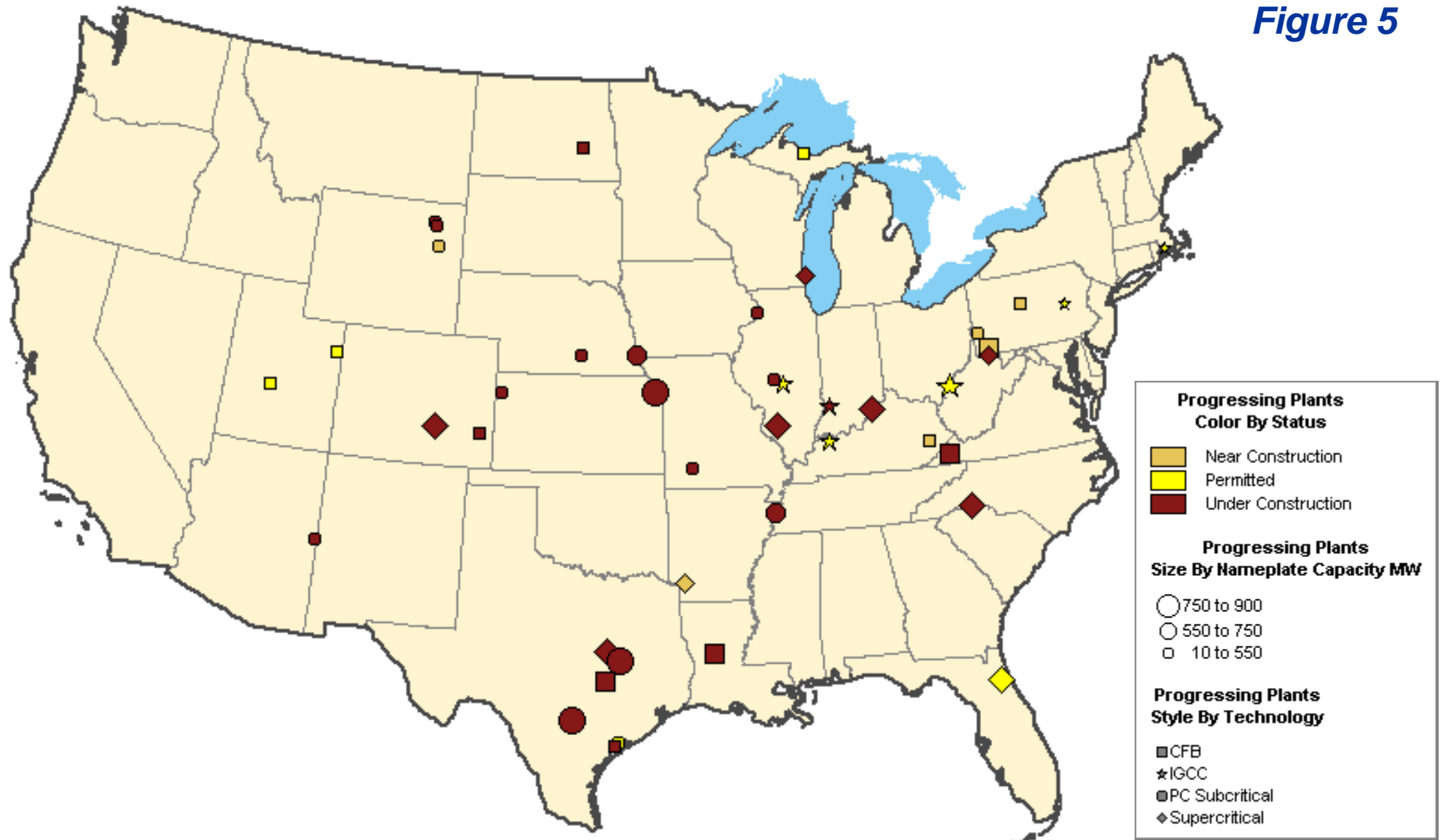
Proposed Technologies of New Plants

Refer to Figure 4 and Table 3

- **Opportunities involving conventional technologies, such as subcritical PC and CFB, are more plentiful and tend to be more advanced due to earlier start in development**
- **Advanced technologies proposed, such as supercritical PC and IGCC, reflect more recent trends in development activity, thus fewer have achieved permitted status**
- **Regulatory uncertainty for GHG legislation is a key issue impacting technology selection and reliability of economic forecasts**
- **Returns on investment for conventional plants, including supercritical, can be severely compromised by the need to subsequently address CO₂ mitigation**
- **Higher capital costs incurred for IGCC may make such new plants less competitive unless their advantage in CO₂ mitigation is assured**

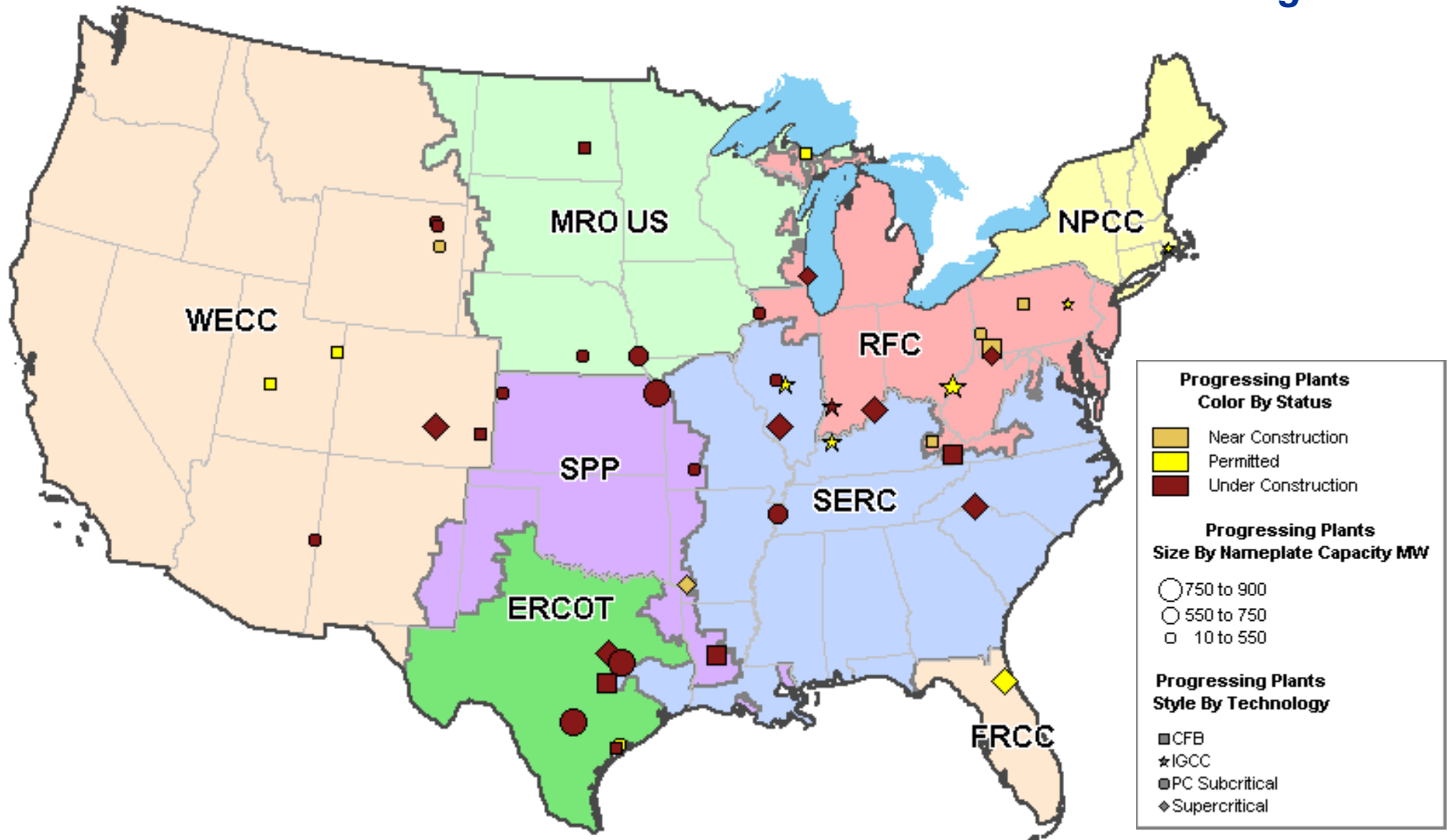
Geographical Map by State: Coal-Fired Plants (Permitted, Near Construction, and Under Construction)

Figure 5



Geographical Map by NERC Regions: Coal-Fired Plants (Permitted, Near Construction, and Under Construction)

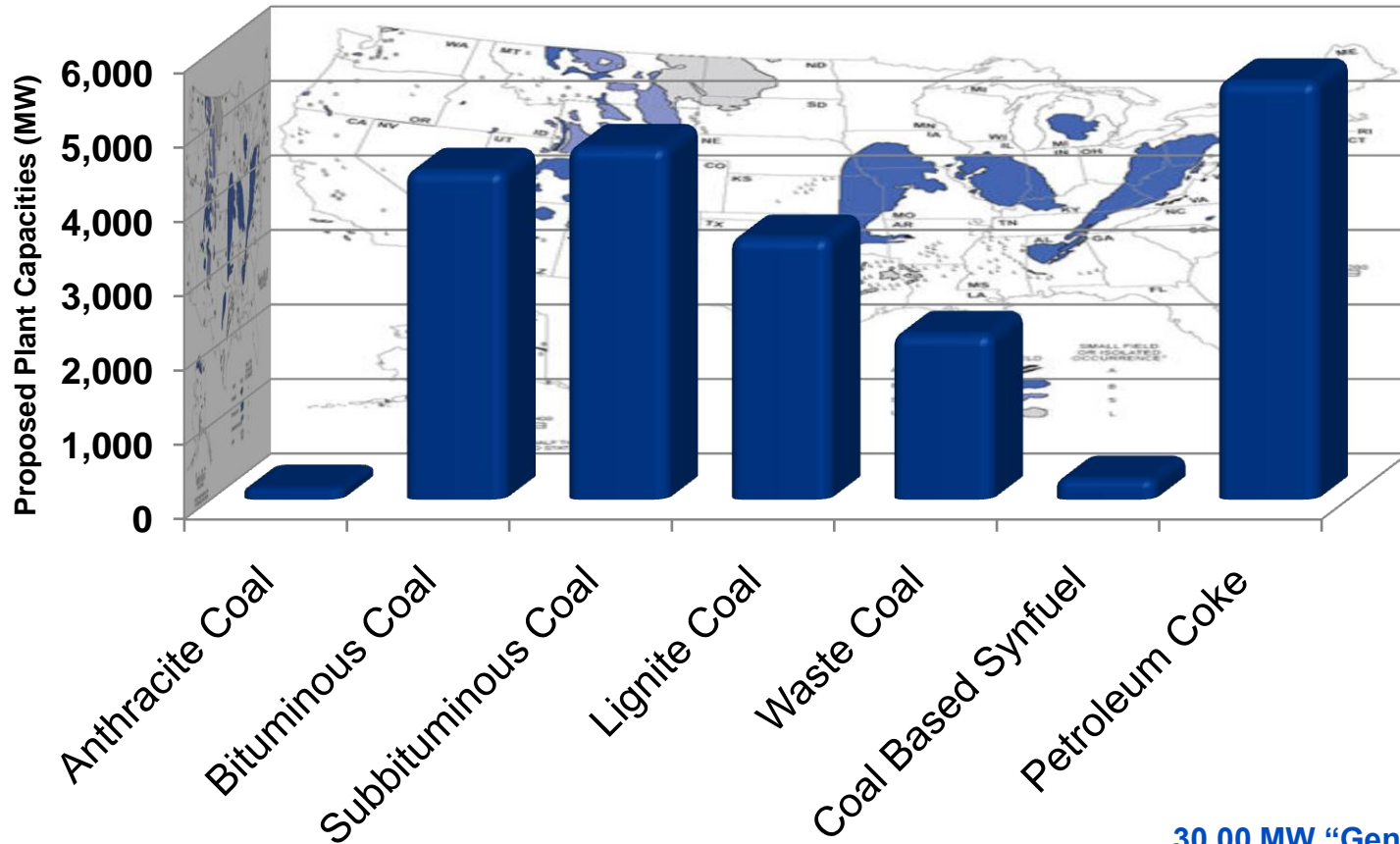
Figure 6



Specified Coal Ranks

All Proposed Plants

Figure 7



30,00 MW "Generic Coal"
Not shown on graph

Summary – 1st Quarter 2009

- One plant (278 MW) has become operational
- “Progressing” projects have decreased by five plants in total MW involved (from 26,131 MW to 22,236 MW)
- 2,000 MW of new capacity have been proposed and 8,642 MW have been canceled
- The net decrease of total proposed capacity, if the 1 operational plant was not removed from the tally, is 13%
- 77% of canceled plants were at the announced stage
- Fewer “announced” projects were proposed, therefore decreasing the overall tally of the projects