

Tracking New Coal-Fired Power Plants



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

History 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 been significantly less than new capacity announced.

This report focuses on those power plant projects with the most potential to achieve significant progress toward completion, to support more accurate assessment of the ability of this segment of the power generation industry to provide adequate new electricity capacity in various regions of the United States.

The Department of Energy does not warrant the accuracy or suitability of this information.



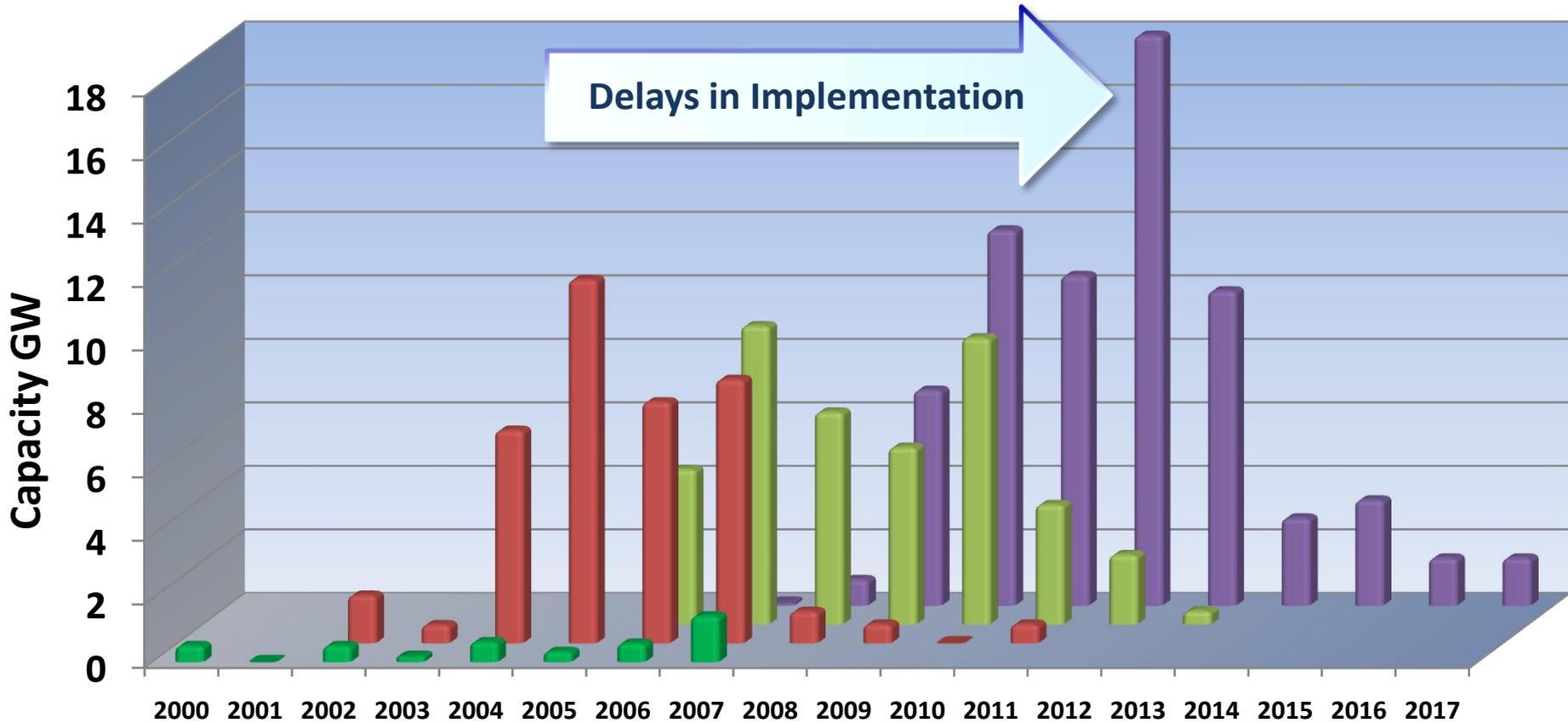
Tracking New Coal-Fired Power Plants

- The purpose of this report is to provide a perspective of coal-fired power plants that are currently under development, with a focus on those displaying significant progress toward commercial operation
- The status of the proposed projects ranges from project announcements to those under construction
- Project announcements do not necessarily lead to a new operating coal-fired power plant and can be a misleading indicator of capacity additions
- Although the number of cancellations can be significant, announcements that are cancelled before or during the permitting phases are not unusual and thus less meaningful
- Plants that are permitted or under construction reflect actual progress and offer a better perspective of what new capacity may be possible by region
- Halted or deferred project development may result in insufficient electricity capacity growth, which could impact regional economic growth



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
 ■ October 2007



Historic Capacity Additions by Years

Refer to Figure 1

- **Actual plant capacity, commissioned since 2000, has been far less than new capacity announced. Year 2002 report of announcements reflected a schedule of nearly 12,000 MW to be installed by 2005, whereas only 329 MW were achieved**
- **The trend over several years has reflected the bulk of power plant proposals shifting to the right due to delays and project uncertainty**



Current Coal-Fired Capacity Additions

Table 1

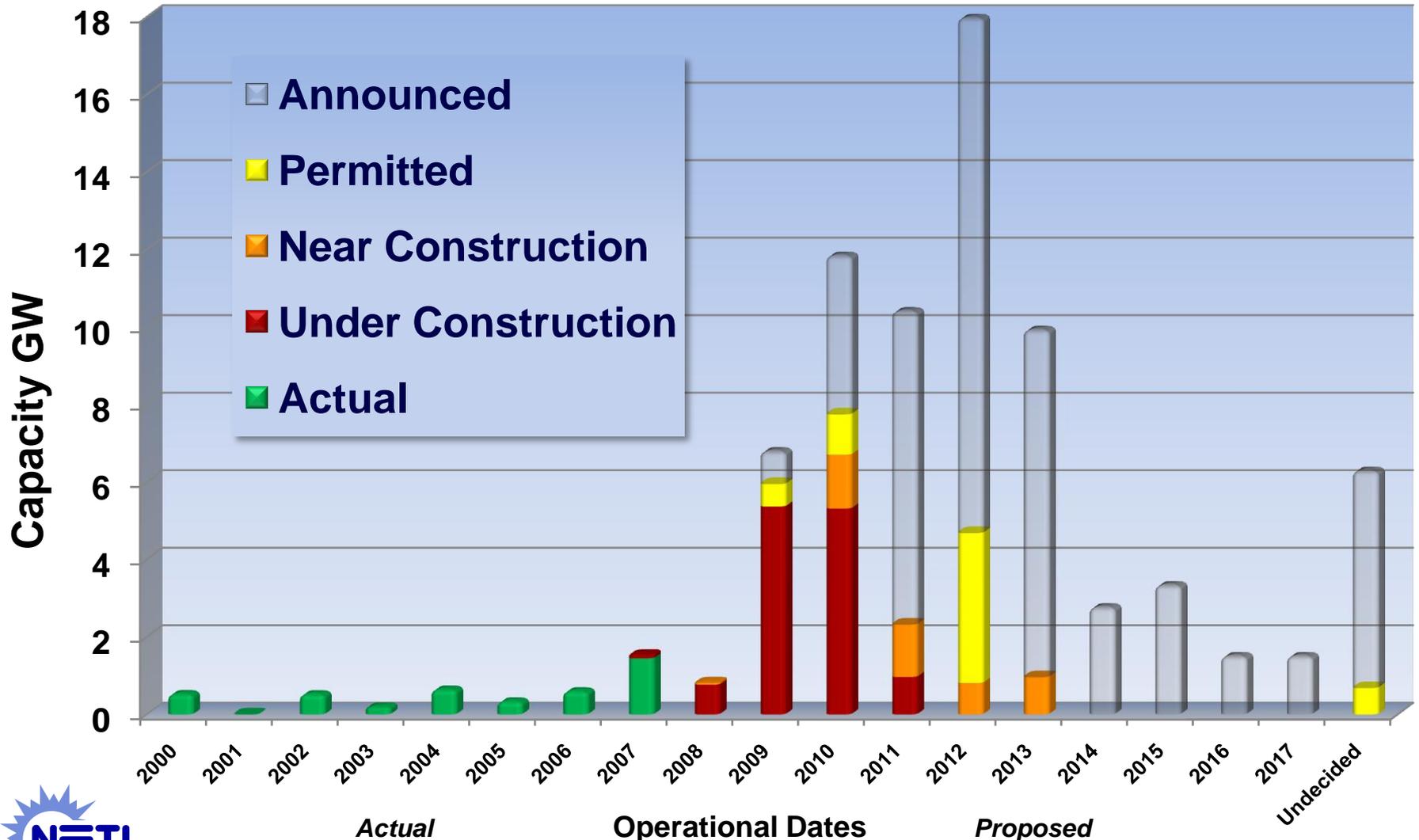
		<i>General Status</i>	<i>Number of Plants</i>	<i>Capacity (MW)</i>
Progressing Projects	}	<i>Under Construction</i>	24	12,506
		<i>Near Construction</i>	8	4,565
		<i>Permitted</i>	13	6,169
		SUB TOTAL	45	23,240
Uncertain Potential and Timing	}	<i>Announced (early stages of development)</i>	76	48,440
		TOTAL	121	71,680

<i>Status Listing</i>	<i>Description</i>
<i>Under Construction</i>	Project is under construction
<i>Near Construction</i>	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.
<i>Permitted</i>	In the permitting phase. Two or more permits approved or fuel or power contracts have been negotiated.
<i>Announced</i>	Early stages of development to filing for permits. May include a feasibility study.



Current Capacity Additions by Years

Figure 2



Current Capacity Additions by Years

Refer to Table 1 and Figure 2

- **Figure 2 is the graphical representation of Table 1**
- **Progressing plants are those projects with status that is either permitted, near construction, or under construction**
- **Progressing plants have a higher likelihood of advancing toward commercial operation, however there is still a degree of uncertainty in these projects**
- **EIA currently projects the need for an average of 6,000 megawatts per year for 23 years through 2030.**



Current Capacity Additions by Years

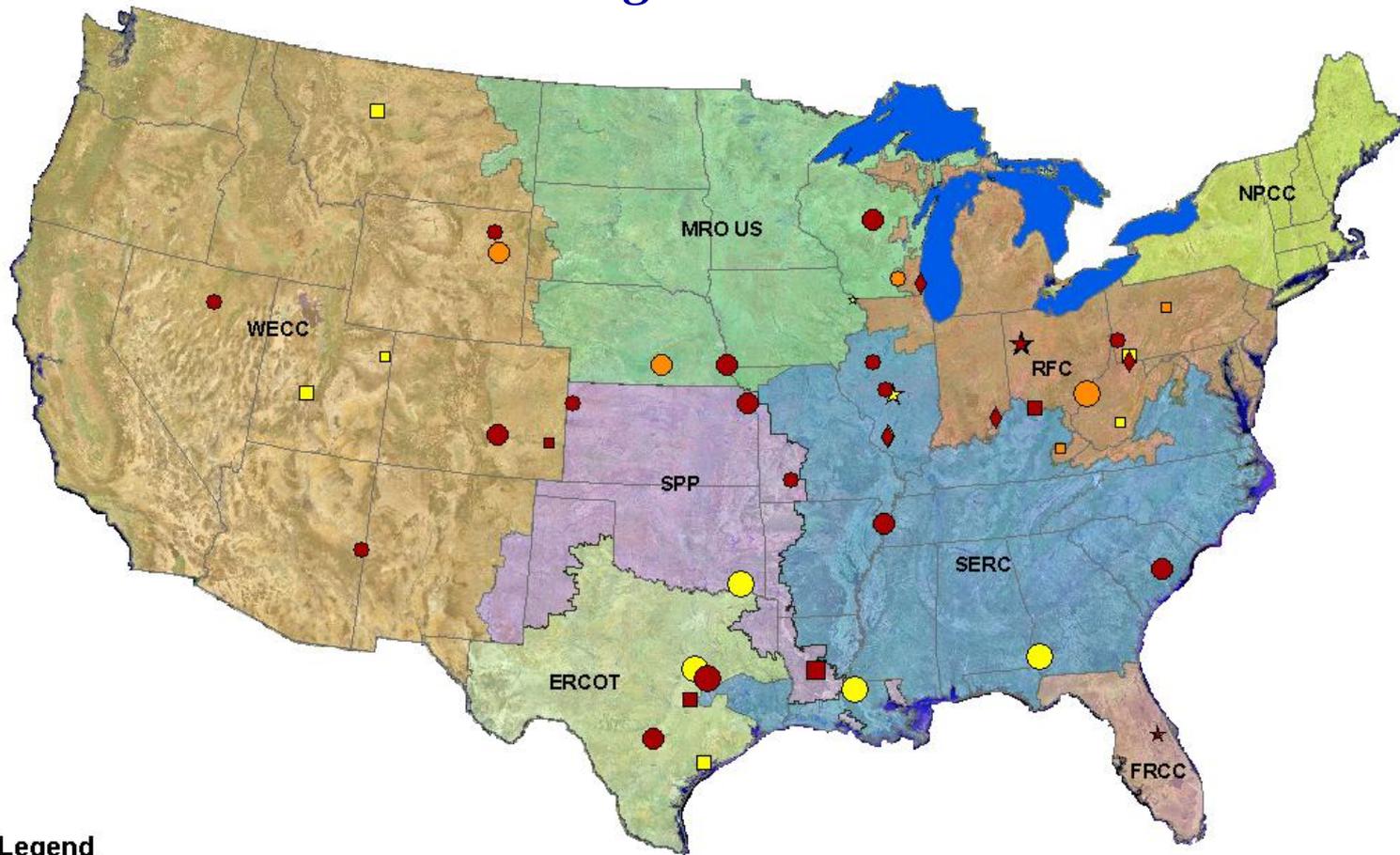
Refer to Table 1 and Figure 2

- Actual plants commissioned, from 1997 through 2006, have averaged 293 MW per year; this has influenced the levels of skilled human resources available to perform currently projected developments
- The 2,400 MW of new added capacity installed in the last three years (~800 MW per year) is only about 16% of the 15,000 MW of progressing plants that are proposed to be operational in the next three years.
- Recognizing current concerns regarding availability of skilled labor for power plant engineering, procurement, and construction activities, further investigation into the viability of current schedules is warranted.



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

Figure 3



Legend

Plant Size (MW)	Technology	Status
◇ 7 - 219	□ CFB	○ Near Construction
○ 220 - 599	☆ IGCC	○ Permitted
○ 600 - 1634	◇ Supercritical	● Under Construction
	○ PC Subcritical	



Proposed Capacity Relative to NERC Regions

Table 2

NERC Region		Progressing Projects				Announced	Grand Total
		Under Construction	Near Construction	Permitted	Sub Total		
ASCC	Capacity (MW)	-	-	-	0	300	300
	Plants	-	-	-	0	2	2
ERCOT	Capacity (MW)	2,965	-	1,200	4,165	4,100	8,265
	Plants	3	-	2	5	4	9
FRCC	Capacity (MW)	315	-	-	315	1,382	1,697
	Plants	1	-	-	1	2	3
MRO US	Capacity (MW)	1,163	275	-	1,438	4,305	5,743
	Plants	2	2	-	4	9	13
NPCC	Capacity (MW)	-	-	-	0	1,020	1,020
	Plants	-	-	-	0	3	3
RFC	Capacity (MW)	2,197	1,850	1,524	5,571	7,558	13,129
	Plants	3	3	4	10	12	22
SERC	Capacity (MW)	2,550	2,120	1,975	6,645	7,698	14,343
	Plants	6	2	2	10	15	25
SPP	Capacity (MW)	1,832	-	750	2,582	1,535	4,117
	Plants	4	-	1	5	3	8
WECC	Capacity (MW)	1,484	320	720	2,524	19,667	22,191
	Plants	5	1	4	10	24	34
N/A	Capacity (MW)	-	-	-	0	875	875
	Plants	-	-	-	0	2	2
Total Sum Capacity (MW)		12,506	4,565	6,169	23,240	48,440	71,680
Total Count of Plants		24	8	13	45	76	121

Evaluating Added Capacity on a Regional Basis

Refer to Figure 3 and Table 2

- **A realistic view of new capacity additions is important to establish the electricity capacity margins necessary to support economic growth on a regional basis**
- **Further evaluation of project status is needed to provide a comprehensive outlook for the nation's coal-fired power fleet development status by region**
- **Additional evaluation should take into consideration NERC's forthcoming 2007 Long Term Reliability Assessment**



Proposed Technologies of New Plants

Figure 4

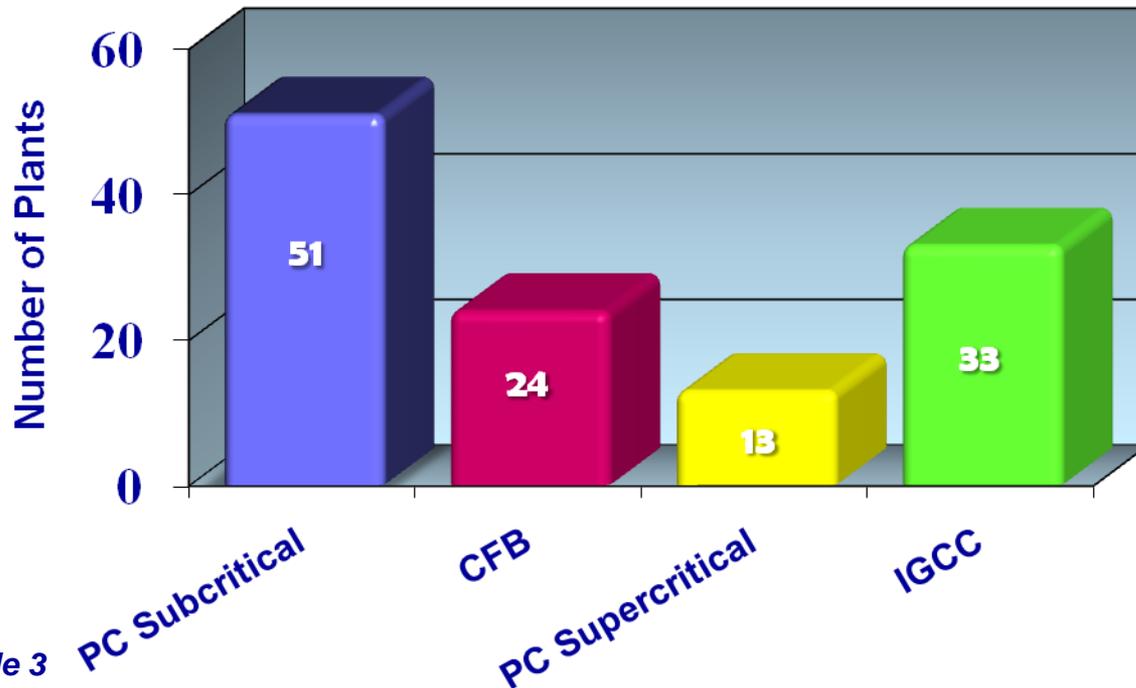


Table 3

<i>Technology Listings</i>	<i>Operational (Since 2000)</i>	<i>Progressing (Permitted, Near-, and Under Construction)</i>	<i>Announced</i>	<i>Total Proposed</i>
<i>PC Subcritical</i>	10	25	26	51
<i>CFB</i>	8	12	12	24
<i>PC Supercritical</i>	1	4	9	13
<i>IGCC</i>	1	4	29	33



Proposed Technologies of New Plants

Refer to Figure 4 and Table 3

- **Conventional technologies, such as subcritical PC and CFB, will continue to play a significant role in providing new capacity**
- **A substantial number of IGCC plants are beginning to be proposed, which is indicative of their high efficiency, clean environmental profile, and ability to capture CO₂ should GHG emission control be necessary**
- **A smaller fraction of advanced technologies proposed, such as supercritical PC and IGCC, have made it through the permitting stage as these technologies reflect more recent trends in development activity**



New Coal-fired Power Plant Development

Few Near-term Alternatives Exist

- **Following several years of delay, new coal-fired generation is increasingly required for maintaining minimum regional electricity capacity margins**
- **Forecasts of North American natural gas supply to U.S. are flat to declining by 2030; added gas-fired generation needs to rely on imported liquefied natural gas (LNG) or new higher efficiency plants**
- **Nuclear power is increasingly recognized as an option but meaningful added capacity remains beyond the timeframe of this analysis**
- **ERCOT study: 6,300 MW of wind had same load carrying capacity as 550 MW of thermal generation (i.e. 8.7%, due to unreliability of wind generation when power demand is highest)**
- **Potential carbon legislation introduces need for large incremental power demand for carbon capture and storage; will require equivalent replacement capacity and more in order to support economic growth**



Summary

- **Historically, new coal-fired power plant development announcements are not valid indicators of actual new capacity installations**
- **Current power plant development status indicates that approximately 1/3 of announced megawatts have progressed through permitting and/or into construction**
- **The current schedule for commissioning of plants may not be achievable, considering the implicit capacity reflected by actual recent plant completions by the industry – a situation requiring more investigation**
- **If the timely completion of coal-fired power plants cannot be attained, this may lead to inadequate regional capacity additions to support electricity demand and economic growth – NERC's 2007 Long Term Reliability Assessment will provide important perspective**
- **Advanced technology developments, such as supercritical and IGCC, lag in progress as they have been more recently announced and may also be anticipating legislative support related to climate change**

