BY THE NUMBERS

The generation sector of the electric power industry is characterized today by a mini boom in gas-turbine-based project development and wind exuberance on accelerating cancellations of coal-fired plants and increasing requirements for renewable energy. But how will developers' plans be affected by the credit crunch and deepening recession? Gas is affordable again and may remain attractive through 2012

By Rita Beale, Energy Ventures Analysis Inc

The trajectory of US coal-fired powerplant announcements turned sharply downward with cancellations exceeding new announcements by 8.5 GW, as tracked for the five consecutive quarters through 3Q/2008. The downward acceleration came from heightened environmental pressures and skyrocketing capital costs—the latter reportedly reaching $3500/kW of nameplate capacity for circulating fluidized-bed technology and $5000/kW for pulverized-coal firing with carbon capture.

The cumulative impact is a mini-boom in gas, and announced capacity additions for wind now surpassing those for coal. While only one-third the size of the boom years, 70 GW of gas turbines (GTs) have been announced through 2015. New nuclear is unlikely before 2017, on any scale.

And now the historic recession and credit crunch are adding a high level of uncertainty to even the most solid developers' plans. Small wind projects are most likely to be affected by postponements, with credit difficult to access and with the majority of wind projects in the early development stage.

Coal units already under construction have a fair chance of being completed; but the rest remain at high risk of cancellation. During the recession, gas announcements may freeze at today's level—at best. Expect some contraction when another industry snapshot is developed later in the year.

US electric consumption fell by about 1.1 % last year, and is expected to decline another 0.6% in 2009. A

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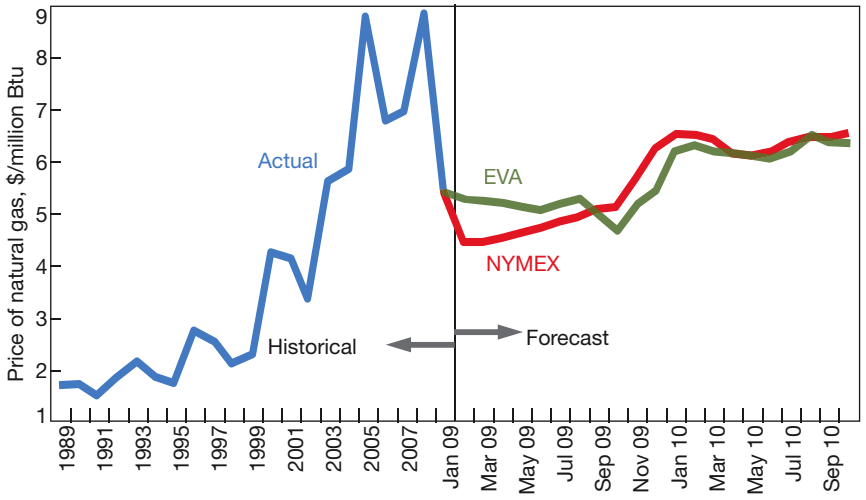
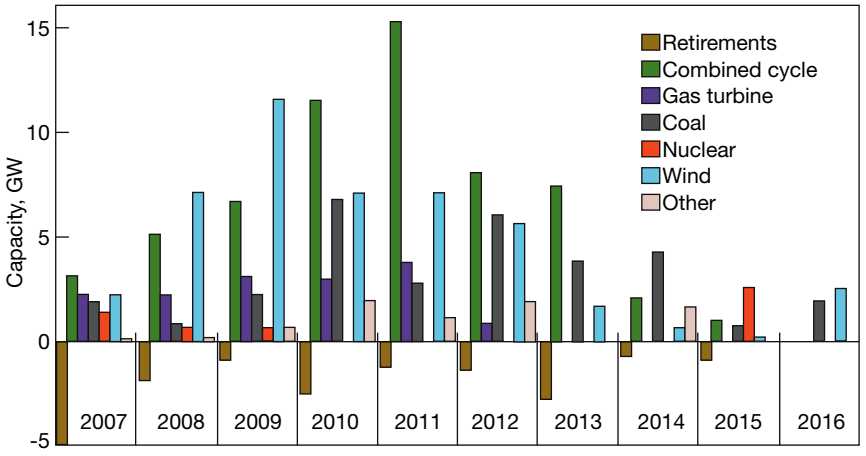


1. Henry Hub natural-gas prices may remain at fairly attractive levels through 2012. Chart shows forecasts by EVA and New York Mercantile Exchange. Projections are based on data available Jan 24, 2009



2. Capacity additions announced for the 2008-2016 period total 152,150 MW, based on information available at the end of last September. Natural gas will fuel 46% of the new generation, followed by wind, 27%; coal, 19%; nuclear, 2%; all other, 5%. Note that data are based on nameplate capacities

Who is EVA?

Energy Ventures Analysis Inc (EVA), Arlington, Va, specializes in energy and environmental market analysis and forecasting associated with the power, natural gas, coal, oil, and emissions markets. It also assists clients in the formation, execution, negotiation, and litigation of major fuel and transportation contracts, as well as in the purchase and sale of electric power assets. Rita Beale can be reached at beale@evainc.com, or at 703-276-8900.

rebound is likely in 2010, perhaps by as much as 2.7%.

The return to moderate natural-gas prices attributed in part to a revival of domestic production, may last through 2012 (Fig 1). Combined-cycle capacity factors are expected to increase in 2009 and 2010 if gas remains attractive and these units are dispatched ahead of the least efficient coal plants—at least occasionally.

Planned US gas-turbine additions average nearly 12 GW/yr through 2013

Capacity announcements for 2008-2016 total 152 GW (Fig 2). GT-based simple-cycle, cogeneration, and combined-cycle plants account for 46% of that; nameplate wind capacity is 41 GW, surpassing coal-plant announce-

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EVA's project tracking methodology

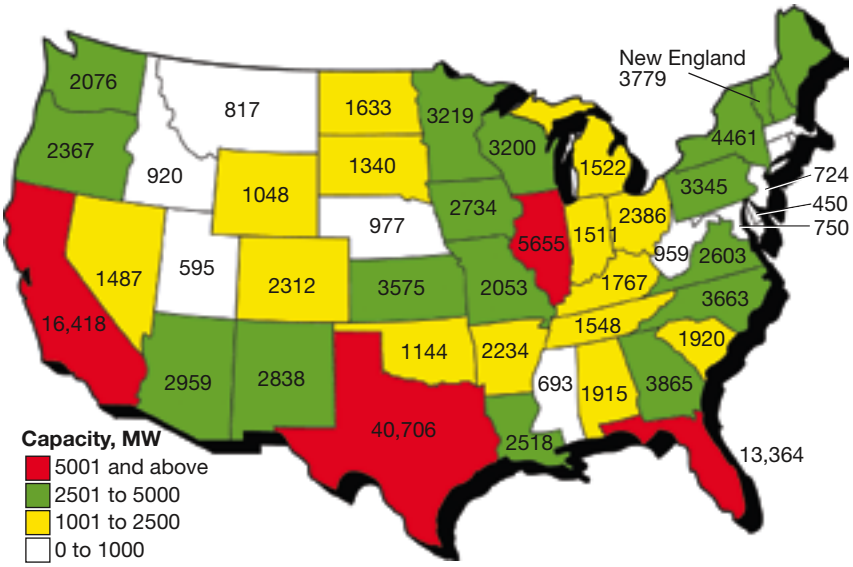
Today's mixed bag of regulation and deregulation make it far more difficult to access information on power-project development than in the regulated era. EVA has continually tracked announcements of changes to powerplant capacity since 1998. This includes new plants, retirements, uprates, and derates by fuel type in six distinct stages of development.

To track project development in a consistent and orderly fashion, EVA designates each project into one of the following six categories that rank progress towards completion: In operation (Category 1); under construction (2); advanced development stage (3); early development stage (4); unlikely (5); and withdrawn (6). EVA's seasonal methodology counts capacity in service by June 1 only; units added thereafter are attributed to the following year.

Categories 1, 2, and 6 are straightforward and easily observable. New projects often, but not always, start with public introductions by the developers themselves. When first announced, natural-gas-fired and renewable-energy projects are assigned to Category 4. New coal and nuclear projects initially are assigned to Category 5 because of the difficulties associated with building these two types of plants.

During the early-development phase, project information often is difficult to access. However, EVA retains its initial ranking for at least as long as the developer continues to pursue the project actively. Distinctive qualitative attributes relate to a particular project's progress through the development phase.

A project advances to Category 3 when it has fulfilled most, if not all, of the basic elements necessary for construction—for example, permitting, financing, and orders for major equipment. A project may be moved back a category, if it misses targeted milestones or other indicators that point to a lapse in development activity—such as no site identified. Category 6 is assigned when the developer formally withdraws the project.



3. Looking at capacity additions by state from Jan 1, 2008 through Dec 31, 2016, South Dakota (43%), Texas (39%), New Mexico (39%), Kansas (31%), Idaho (26%), California (25%), and Florida (23%) lead in new generation as a percentage of installed capability. States with the most new generation on the books are Texas, with a whopping 40,706 MW, California (16,418), and Florida (13,364)

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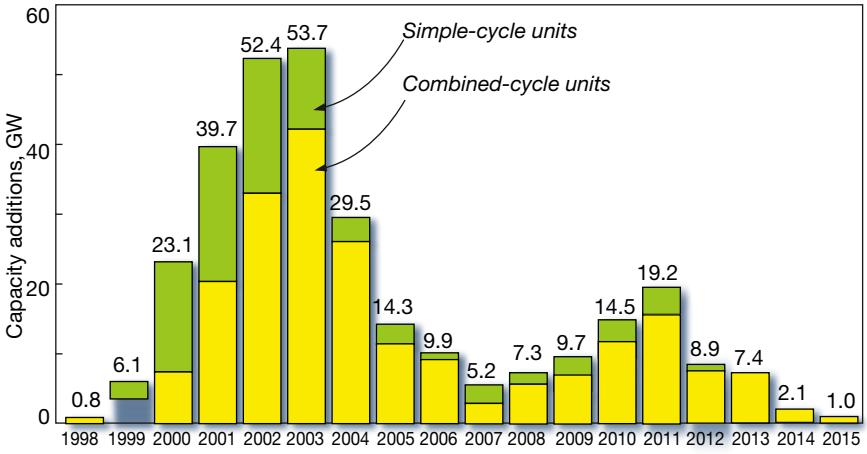
4. Bar graph of GT-based additions suggests that a mini-boom is underway—one expected to last at least through 2012. Some new units are required to replace coal-fired plants announced and subsequently canceled because of environmental and cost pressures. For the period evaluated, current data suggest that 82% of the capacity will be produced by combined-cycle facilities, remainder simple-cycle. But because peaking units are ordered much closer to their commercialization dates than combined cycles, expect the ratio between the two to decrease somewhat



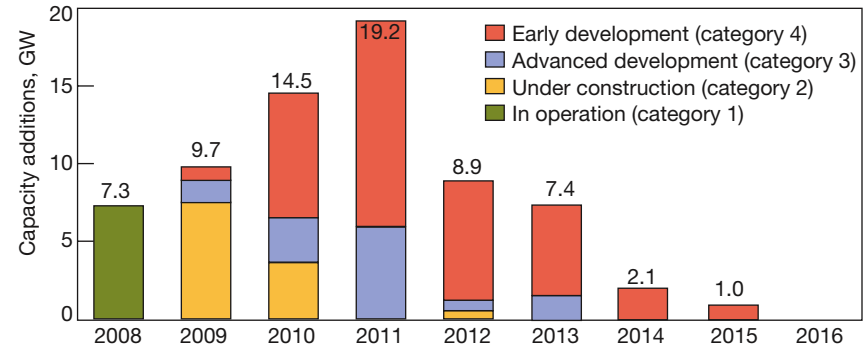
ments that stand at almost 30 GW. About 7.3 GW of new simple- and combined-cycle capacity began commercial operation in time for last summer's peak-demand season. New gas-fired plants are located mainly in Texas, California, and Florida (Fig 3).

Fig 4 presents the recent history and a look ahead for GT-based capacity. The illustration shows the spectacular growth of this industry sector in the 1999-2005 period, when more than 200 GW was installed. Years 2007 and 2008 are recent low points. The deck for 2009 through 2011 will be reshuffled, potentially flattening and spreading some of that capacity into 2012 and beyond. A federal renewable portfolio standard for electricity will keep GT capacity on the near-term radar to provide a more reliable backup to wind-powered generation and to quickly fill sudden demand gaps as the economy rebounds.

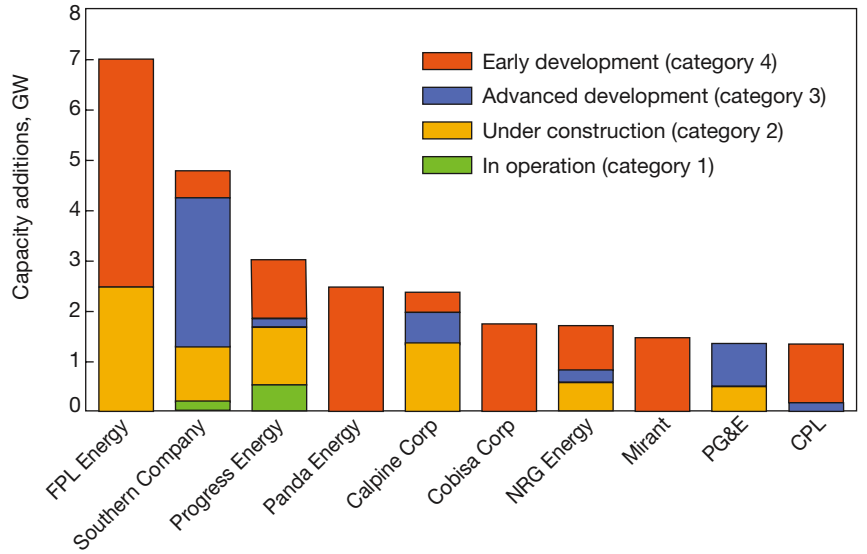
EVA's tracking of power project announcements indicates that 55% of the GT-based capacity expected in service by the 2015 season is in the early development stage (Fig 5). These plants are the most vulnerable to changes in developers' plans. Another 18% of capacity is in advanced development and an additional 17% is under construction.

As part of its tracking program, EVA monitors each phase of every project as it winds through the development process. Each project is assigned a development category number that corresponds to its level of progress (see large sidebar for details).

Fig 6 shows the companies most active in terms of developing new capacity. FPL Energy, Juno Beach, Fla, regained its traditional top spot, after being dropped into second place by The Southern Company, Atlanta, last year. CCJ



5. Gas-turbine capacity by stage of development profiles 70 GW of announced generation for the 2008 to 2016 period. This is about double the capacity presented on a comparable chart published only two years ago (access article in the 1Q/2007 issue at www.combinedcyclejournal.com/archives.html). The recession likely will delay and stretch-out some projects—and possibly force the cancellation of a few. Keep in mind that gas turbines are installed quickly, so more than half of the new generation profiled (55%) is in the early development stage, making it relatively easy to tweak startup dates. Approximately 18% of the capacity is in an advanced stage of development, another 17% is under construction; remainder already is in service



6. Chart of GT-based plants under development by the top 10 owners shows FPL Energy working on 7 GW of new capacity—nearly three times last year's total. Southern Company, which led in the 2008 chart, has nearly 5 GW in progress—about 1 GW more than it had a year ago

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