

The Cost of New Generation Construction

The Electric Power Supply Association¹ (EPSA) applauds FERC for recognizing the challenging global commodity economy facing the electricity industry today. The cost increases faced by electricity producers are leading to increased prices for consumers, just as input costs for a number of other products and services are resulting in higher consumer prices – for instance, in airline fares, grocery bills, and other forms of energy. These rising costs for many of the materials used in electricity infrastructure construction are occurring at the same time that power suppliers are planning for and starting to embark on a large generation build-out to meet growing U.S. demand. As demonstrated in the research of numerous academic and industry experts detailed below, costs for infrastructure materials, which are rising globally for all types of construction projects, are not expected to abate soon.

This creates serious challenges for electricity suppliers. Most importantly, the increases in the cost of new generation construction mean a significant increase in the cost of new entry for suppliers. The cost of new entry is used in various ways in organized markets under capacity mechanisms to incent sufficient resources in light of mitigated energy markets. Having inadequate measures of the cost of new entry reflected in capacity mechanisms can be a serious impediment to new entry and make achieving the reliability goals of capacity mechanisms more difficult. Because of rapidly rising costs of new generation construction, it is important for FERC to facilitate submission of revised estimates of the cost of new entry by organized markets in their capacity price-setting mechanisms. Ultimately, new entry by generators is an important factor that will assist in achieving sustainable and reliable supply as well as a healthy, robust and competitive electricity market.

According to Cambridge Energy Research Associates, their construction cost index for a range of new power plants has increased by 130 percent between 2000 and 2007.² This rapid cost increase is impacting all types of power plants. In a 2007 survey of developers, engineering, procurement and construction contractors and industry professionals, Citi Investment Research concluded that average per kilowatt costs for power plants have greatly increased since 2005:

¹ EPSA is the national trade association representing competitive power suppliers, including generators and marketers. Competitive suppliers account for nearly 40 percent of the installed generating capacity in the United States, and provide reliable and competitively priced electricity from environmentally responsible facilities. EPSA seeks to bring the benefits of competition to all power customers. The comments contained in this paper represent the position of EPSA as an organization, but not necessarily the views of any particular member with respect to any issue.

² IHS Inc. and Cambridge Energy Research Associates, "Power Capital Costs Index," February 14, 2008.

<u>Type</u>	<u>Percentage Cost Increase</u>
Nuclear:	45%
Integrated gasification combined cycle coal:	60%
Ultra super critical coal:	50%
Pulverized coal:	66%
Combined cycle gas turbine:	33%
Single cycle gas turbine:	50% ³

It is critical that as power plant developers face this sharp increase in costs they have the competitive incentives to construct and operate capital-intensive projects efficiently. The U.S. Energy Information Administration estimates that up to three-quarters of construction costs are directly related to materials and equipment.⁴ The price for all classes of commodities necessary to support electricity infrastructure has been increasing rapidly over the same period. According to the Brattle Group, over the past ten years the cost of steel products has increased by 70 percent, copper 300 percent, aluminum 70 percent, cement 40 percent and electric wire nearly 60 percent.⁵ In conversations with EPSA member companies it is clear that these increases have continued, and are even significantly escalating in 2008.

The rise in the price of these commodities has had a direct impact on the costs of new generation. For example, Bechtel is building a 1,230 megawatt coal-fired power plant for WE Energies in Oak Creek, Wisconsin, at a cost of \$2.15 billion. The large power plant will require three million cubic feet of concrete and over 30,000 tons of steel.⁶

In fact, in jurisdictions with long-term fixed rates the true cost of new power is rising faster than electricity rates. According to Revis James of the Energy Policy Research Institute, "we don't really have full transparency between the prices you and I see in our monthly bills and the production costs of electricity."⁷ Further compounding the problem, the industry is facing the dual problem of an aging workforce and labor shortages as global demand for new construction is sending both labor and material to China, India and other booming economies.

³ Brian Chin and Carlos Santalesa, "Replacement Cost Analysis: Using Asset Valuations to Gauge Recession Risk & Recovery," Citi Investment Research, January 13, 2008.

⁴ "Impacts of Rising Construction and Equipment Costs on Energy Industries," *Annual Energy Outlook 2007*, Energy Information Administration.

⁵ Peter Fox-Penner, Marc Chupka, Robert Earle, "Transforming America's Power Industry: The Investment Challenge, Preliminary Findings," The Brattle Group, April 21, 2008.

⁶ <http://www.bechtel.com/elm-road-generating-station.html>

⁷ Nathaniel Gronewold, "Price shocks looming for power plant owners," *ClimateWire*, May 14, 2008.

Rising global demand for all these products is at the heart of the challenge. As China, India, and other developing nations continue to grow, they demand more of all these products to build their national infrastructure: roads, cities, power plants, etc. The impact that developing countries have on rising construction costs in the United States cannot be underestimated. In 2005, some estimated that China consumed 40 percent of the world cement supply and 25 percent of the world steel supply.⁸ Similar consumption patterns are likely to continue. Concurrently, the U.S. Energy Information Administration expects that installed U.S. generation capacity will have to be increased by 40 percent by 2030.⁹

The International Energy Agency estimates that China and India will need to add the equivalent of more than 2,000 800-MW power plants in a similar timeframe. That equates to roughly one full-sized coal plant being built every two weeks in China alone,¹⁰ showing that it is expected to add more capacity in the next 13 years than is currently installed in the United States.

Beyond just developing nations, global electricity use is expected to double in the coming decades.¹¹ As the world demand for electricity increases, the cost of construction will continue to rise as more and more global consumers are competing for limited amounts of natural and human resources.

The weakening U.S. dollar has further compounded this issue by making goods more expensive to American consumers, including generation developers. The U.S. Dollar Index, which is listed on the ICE Futures Exchange,¹² is currently at its lowest level since the index was started in 1973; in the past twelve months alone the U.S. dollar has weakened about 15 percent against the Euro.¹³ According to the Federal Reserve Bank of Chicago:

A weak dollar also hurts some people and benefits others. When the value of the dollar falls or weakens in relation to another currency, prices of goods and services from that country rise for U.S. consumers. It takes more dollars to purchase the same amount of foreign currency to buy goods and services. That means U.S. consumers and U.S. companies that import products have reduced purchasing power.¹⁴

⁸ Standard & Poors, "Increasing Construction Costs Could Hamper U.S. Utilities' Plans To Build New Power Generation," May 2007, Pg. 1-2.

⁹ Energy Information Administration, "Annual Energy Outlook 2008," December 2007.

¹⁰ <http://www.csmonitor.com/2004/1223/p01s04-sten.html>

¹¹ International Energy Agency, "World Energy Outlook 2007," November 2007.

¹² The US Dollar Index (USDIX) tracks the value of the U.S. dollar through a weighted geometric mean with six world currencies: the Euro; the Japanese Yen; the British Pound Sterling; the Canadian Dollar; the Swedish Krona; and the Swiss Franc.

¹³ Jeremy Gaunt, "No rescue expected for weak dollar," *Reuters*, March 2, 2008.

¹⁴ "Strong Dollar, Weak Dollar: Foreign Exchange Rates and the U.S. Economy," Federal Reserve Bank of Chicago - www.chicagofed.org/consumer_information/strong_dollar_weak_dollar.cfm.

The spot price of steel has remained at historic highs for the last number of years. In 2002, the price of hot-rolled carbon steel, a benchmark industrial product, was as low as \$222 per ton. The price of steel hovered around \$300 per ton through 2004, mainly due to government-imposed price restrictions. By September 2004, nine months after the repeal of these constraints, the price of steel had risen to \$700 to \$800 per ton.¹⁵ Since December 2007 steel prices have increased by 40 to 50 percent and industry executives believe they have not yet reached their peak. Over the same period iron ore prices have increased 71 percent and both scrap steel and coking coal prices have doubled.¹⁶

The rapid increase in the price of steel has occurred for several reasons. One of the most fundamental is increased global demand, largely from China. China has recently become the largest steel maker, consumer and importer in the world.¹⁷ China's increased demand has placed upward pressure on global steel prices, which are felt across the U.S. economy. The strong consumption trends seen today are expected to continue into the near future in China and other high growth countries such as Brazil and India, with global demand expected to grow between 6 and 7 percent annually over the next 12-18 months.¹⁸ Furthermore, the price of steelmaking inputs has also risen dramatically. Between 1997 and 2006 the real price of iron ore has risen 75 percent while steel scrap has gone up 120 percent.¹⁹ The prices of coking coal and natural gas have increased as well, further raising the price of steel. With the high global demand for steel, shortages and delays in delivery have also had a significant negative impact on infrastructure development causing delays and further increasing costs.

Other key infrastructure construction inputs have seen similar cost increases with the price of cement and crushed stone rising by 30 percent between 2004 and 2006. This is attributable largely to the same factors that have caused steel prices to reach historic highs: high demand in China and increased costs of inputs, mostly energy.²⁰

There have also been other cost increases associated with plant development that have experienced rapid growth recently. These include property values for generation sites, interconnection costs and union labor wages. Some of these face the same input pressures as have been listed above, others are outgrowths

¹⁵ Fitch Ratings, "Steel Outlook 2008," December 10, 2007.

¹⁶ Katie Howell, "Rapid price spikes stall major construction projects worldwide," *Greenwire*, May 15, 2008.

¹⁷ Stephen Cooney, "Steel: Price and Policy Issues," Congressional Research Service, August 31, 2006, p. 20.

¹⁸ Fitch Ratings, "Steel Outlook 2008," December 10, 2007.

¹⁹ Marc Chupka and Gregory Basheda, "Rising Utility Construction Costs: Sources and Impacts," The Brattle Group, September 2007, p. 13.

²⁰ Chupka and Basheda, p. 17.

of an economy that has seen a period of worldwide growth over the last decade. Regardless, it is important to recognize that while these costs tend to be difficult to quantify, their effects on the price of an infrastructure development are substantial and should not be overlooked.

Environmental compliance is the non-input cost that has garnered the most recent attention and is also increasing the cost of construction, notably for coal-fired plants. Meeting existing clean-air regulations is expected to cost an additional \$2.7 billion a year in 2010 and \$4.4 billion in 2015.²¹ This is *before* taking into account necessary federal carbon regulation expected to occur in the next few years.

EPSA appreciates FERC's efforts to remain informed of the undeniable increases in infrastructure material commodity prices and the challenges they present for electricity suppliers across the country. Competitive suppliers are working with the incentives that only a robust marketplace can provide to develop the necessary generation supply in the most efficient and lowest risk manner possible for consumers. As noted in a recent EPSA report:

Consumers have benefited from changes in the industry that have imposed greater risks on investors than was the case under traditional cost-based rate regulation. The vast majority of investment in generating units over the decade since 1995 has been made by non-utility entities, with investors bearing risks of cost overruns and surplus capacity. Competitive market structures typically provide no assurances about future prices for power generated, so owners of such generating facilities are at risk to recover a return of and on their investment through competitive markets. This contrasts sharply with investment patterns in the prior decades, when most of the capacity additions were made by regulated electric utilities.²²

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²¹ Susan Tierney, "Decoding Developments in Today's Electric Industry – Ten Points in the Prism," The Analysis Group, October 2007, p. 6.

²² Tierney, p. 15.