

## IGCC, costs and jobs

IGCC, or Integrated Gasification Combined Cycle Technology, is a coal energy production method that offers a smaller environmental footprint and more efficient energy production than a conventional coal plant. On the surface, IGCC may seem more expensive to build and operate than the traditional pulverized coal production method. Today, this is true, but the governing economic dynamics will change, and IGCC will soon be the better cost option over traditional pulverized coal.

Future projections of costs and liabilities must be taken into account when assessing the viability of an energy source and strategy. Power plants run for decades, and cost estimates must be done with this in mind. Regulators and producers must consider the laws and market conditions of the future. If they fail to do so, their decisions today could cost ratepayers significantly down the road. With this in mind, IGCC must be evaluated against pulverized coal based on what is most likely to happen in the electricity market in coming years.

### IGCC's cost efficiency

IGCC is making, and will make, pulverized coal energy production obsolete. IGCC dramatically lowers mercury, NO<sub>x</sub> and SO<sub>x</sub> emissions, and is cheaper to convert to carbon capture production than traditional pulverized coal. The process also has tremendous potential efficiency advantages, and is optimum at dual-use plants, where power generation and industrial production are combined to allow greater efficiency and cost control.

Today, if carbon capture is not a part of the analysis, IGCC has a cost premium over traditional pulverized coal of about five dollars to seven dollars per megawatt hour of energy generated. As a normal operating, coal-fed baseload plant produces electricity at \$35 to \$55 per megawatt hour, five dollars to seven dollars per megawatt hour are significant numbers.

They are numbers, however, that are going down, and will continue to go down, until the cost gap is completely closed. Most pollutants, including carbon dioxide, are easier to strip out of IGCC than a traditional pulverized coal plant. This means that should a carbon dioxide tax be imposed or if a carbon market is created, IGCC will have an advantage both in terms of cost and technology in the near term. If carbon capture is included in estimates, IGCC would have a cost advantage of \$10 per megawatt hour.



Utility companies are pursuing IGCC projects in preparation for carbon emission restrictions which will come. (IGCC plant at Mulberry, FL pictured above)

Many of the nation's largest utility holding companies — American Electric Power, the new Duke Energy (formed by the merger of Duke and Cinergy) and Southern Company — are pursuing IGCC projects, as realize carbon restrictions are coming. These companies are preparing for the change by building IGCC while they can capitalize on a competitive advantage, while others ignore the likelihood of carbon Constraints at great risk.

Even in the interim period without carbon restriction, the costs of IGCC are going to change and improve versus conventional coal. The construction costs are high now because of a lack of “off the shelf” engineering. This is changing very rapidly. Large energy component companies are developing more complete engineering packages. Additionally, efficiency is improving and has a great deal of room to continue. IGCC is a relatively new technology, and its rate of efficiency improvement will continue to be high.

Efficiency gains will lead to fewer pollutants, and in a carbon-constrained world, less cost. Efficiency is tied closely to emission rates. If consumption goes down while output remains stable, emissions will be costly and will be reduced.

### IGCC and the Ohio Economy

In IGCC energy production, there is an increased need for more specialized laborers and employees, compared to pulverized coal. This increase is important. In the electric



utility sector, job multipliers are significantly higher than they are in various other parts of the economy. This means a significant number of local jobs are created community wide when a few electric utility jobs are created.

Co-production is an area in which large job creation gains will be made. IGCC makes the most economic sense when it is coupled with another production process, for example, when the technology also is implemented to produce syngas, hydrogen, chemicals, fertilizers, or other liquid fuels. Petro-chemicals can be manufactured, and sulfur can be extracted during the gasification process and sold either in its elemental form or as sulfuric acid.

## Ohio's advantage

Ohio has particular advantages with regards to IGCC. Our state has the oil fields, abandoned mines, un-minable coal and other geologic formations that are ideal for carbon capture and storage. Ohio also possesses vast coal reserves - this means low transportation costs. Finally, because IGCC is such an efficient method for sulfur removal, Ohio's Eastern coal, which today has to be burned with a high proportion of Western coal because of its sulfur content, can be burnt by itself. This in turn would create a reliable, largely in-state, energy cycle.

## IGCC's potential

The potential significance of IGCC is clear. IGCC is a transitional technology, and will help to bridge current markets to future ones, where environmental impacts are well considered. IGCC represents a strong step towards future technology and future regulatory landscapes.

In addition, there will be large-scale federal support for IGCC technology. The federal government has made a decisive commitment towards coal. The Department of Energy has committed to a decade-long, two billion dollar IGCC cleaner coal research initiative. It is reasonable to expect that this investment will produce IGCC technology advancements, which will find their way to private production, improving the profit margins of IGCC and decreasing the competitive advantage of traditional pulverized coal.

The shift to IGCC as a preferred method of coal energy production over traditional pulverized coal will come, due to two factors: 1) knowing its environmental benefits and its importance as a reliable base-load domestic power source, cleaner coal initiatives are a reasonable alternative to traditional coal; and 2) the creation of a carbon market or carbon constraint will make IGCC economically viable. Once carbon emissions hit a threshold price, traditional pulverized coal production no longer will be able to compete.



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**IGCC will be a cheaper method of energy production than traditional pulverized coal in a number of years. As a result, IGCC should be prominent in Ohio's future. If Ohio chooses to abandon cleaner coal technology now for short-term cost savings, it will face drastic and debilitating economic hardship as carbon does become a liability. However, if Ohio proactively embraces the future of domestic energy production, it can become a national and even global leader, creating jobs, cleaning air and water, and improving quality of life.**

Sources: OEC Coal Policy, IGCC Technology Draft Report – Public Services Commission of Wisconsin, Promoting IGCC power generation and CCS – Clean Air Task Force State Climate Collaborative

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