

INDUSTRIAL COAL GASIFICATION SYSTEMS: FROM COAL TO CLEAN INDUSTRIAL ENERGY

Possibilities for industrial use of coal gasification for industrial plants.

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Good morning, Mr. Chairman and members of the Committee. My name is Bill Douglas. I am the Senior Vice President for Business Development for Econo-Power International Corporation or EPIC. We also have Mr. John Keller, Vice-President and Chief Financial Officer. We appreciate the opportunity to testify this morning.

We are pleased to be here today to share with you our views about the benefits that Industrial Coal Gasification Systems technology can deliver. ICGS can produce a synthetic fuel gas at prices below that of Natural Gas by converting solid fuels, such as coal, which are abundant and economically available in the US. If ICGS can achieve wide spread adoption in the industrial sector, it will help the country displace usage of scarce natural gas, put additional US workers to work mining, transporting and converting coal. Use of economical synthetic fuel gas will assist industry in meeting environmental goals of reducing NOx, mercury and other air pollutants, while also advancing sound energy policy goals of retaining a secure and diverse mix of fuels for industrial process and electric power generation.

EPIC, *The Clean Coal Gasification Company™*, builds, owns and operates industrial coal gasification systems to convert coal to a clean alternative to natural gas. The use of domestic coal offers a stable-priced, clean alternative to volatile-pricing for domestic and imported natural gas and LNG.

EFFECT OF EPACT 2005 ON INDUSTRIALS IN THE US

EPACT 2005 is a major step in providing incentives to bring clean coal initiatives to the very large industrials and Utility companies. It has a very select impact on the small to medium size industrial that is evaluating alternative energy such as

Coal Gasification. The major credit available is the ITC. However, these credits are restricted to certain industries and/or require that the fuel be used for a specific purpose such as the production of electricity. This eliminates a large proportion of the US industrial base as potential users of synthetic fuel gas. The small and medium sized industrials are the companies having the greatest difficulty in dealing with the high price of natural gas and electricity used in their facilities. They are rapidly becoming non-competitive with other nations because of high energy costs. These same companies are also reluctant to change energy sources from the tried and true natural gas and electricity infrastructure. For them, a commitment to change to a coal-based syngas will require some financial incentive. The most effective way to induce a company to change to Coal Gasification is through economic incentives. The way to provide these incentives is to modify EPACT to include the smaller industrials with incentives to use alternative energy sources such as Coal Gasification.

OVERVIEW OF ICGS TECHNOLOGY

ICGS is a process that converts low value fuels such as coal, biomass, and municipal wastes into a high value, low Btu, environmentally friendly natural gas-type fuel, also called "synthesis gas" or simply "syngas". ICGS uses air-blown, modular gasifiers to accomplish the conversion.

Coal gasification has undergone many evolutions and improvements. The EPIC system of gasification and sulfur removal is an updated version of a time tested method to convert coal to a low Btu fuel gas. The EPIC system is covered by US patents (pending) and is manufactured in the US. There are dozens of similar systems in operation for many years in other parts of the world that provide fuel gas for varied industrial processes. The potential US industrial users need some incentive to allow them to accept the system in the US.

Industrial uses include virtually any natural gas fueled industrial process such as boilers, kilns, process furnaces, etc. The ICGS can also refuel older coal fired plants for environmental compliance without adding pollution control systems.

EPIC has also worked with major gas turbine suppliers to gain acceptance of the fuel gas produced in EPIC's system. This acceptance opens the Integrated Gasification Combined Cycle (IGCC) area for even small and medium sized industrial plants.

ENVIRONMENTAL ADVANTAGES OF ICGS

ICGS provides some significant environmental advantages. When ICGS is used to replace direct coal combustion in boilers or kilns, the following benefits are obtained;

- Elimination of particulate emissions.
- Reduction of SO_x emissions by at least 100 times over unscrubbed coal.
- Reduction of NO_x emissions by 90% or more.
- Removal of mercury at greater than 90%.

When ICGS is used to replace natural gas, NO_x reductions of at least 50% are obtained.

It is important to note that only minimal modifications are required to boilers, kilns or process furnaces to use ICGS. For most industrial boiler, kiln or furnace systems, major capital expenditures would be required to achieve compliance with even current environmental regulations. ICGS allows US industrial companies to employ capital to improve process efficiency without having to dilute it for investing non-productive pollution control systems.

In the ICGS process, harmful pollutants are removed from the syngas stream before combustion, rather than in post combustion flue gas treatment. The pressurized syngas stream represents less than 1/100 of the volume of the flue gas from direct coal combustion and the contaminants in syngas are concentrated. Therefore, IFGS pre-combustion clean-up is far more effective and much lower cost than the post-combustion clean-up employed in direct combustion coal steam-boiler plants.

In ICGS, coal ash is converted in the gasifier into a solid, which is similar to conventional coal fired ash which can be employed in the construction industry as road fill or as strengthening aggregate for building concrete. ICGS does not require secure landfill sites for ash storage.

The sulfur is removed from the gas before combustion and is recovered in elemental, non-hazardous form. This sulfur may have economic in certain industrial processes and agriculture. Even if sulfur disposal is required, non-hazardous disposal is easily accomplished.

ICGS SHOULD BE VIEWED AS A FUEL SWITCH AND NOT A NEW SOURCE

In the case of retrofit for industrial boilers, kilns, furnaces, etc, the facility is normally permitted to operate on its present fuel. In general, the facility will continue to operate at the same production level (at a minimum) as with the existing fuel.

ICGS should be viewed as merely a fuel change and not a major modification triggering NSPS standards. Expedited permitting would also help the industrial user to keep competitive advantages while maintaining domestic fuel sources.

Consideration of ICGS's environmental benefits should lead to placing ICGS as PACT (Preferred Available Control Technology) for industrial energy users.

PACT designation would allow industrial customers to more rapidly achieve energy cost stability and remove this aspect of the perceived permitting risk when using ICGS.

ICGS USES

The EPIC ICGS is inherently "modular" and is easily applicable to most industrial processes. The number of gasification modules is determined to closely match the fuel gas needs for each individual user. There is no "one size must fit all" requirement, as is the case with larger oxygen-blown systems being offered for large IGCC plants.

Gasification is a steady state chemical process and steady state industrial processes are the best candidates for its use. With modular ICGS, should the user's fuel gas needs expand, the ICGS is normally easily expandable to match the expanded needs.

Another industrial strategy could be to co-fire ICGS gas with natural gas to obtain partial benefits. The ICGS system can be expanded in the future for increased coal gas use. This strategy could allow the user to more rapidly obtain some ICGS benefits while a larger system is being constructed.

EPIC is working to improve the process and overall efficiency, thereby offering the user increased benefits from ICGS use.

ECONOMIC ISSUES

The nature of ICGS requires a significant capital commitment to build the system. Past and present incentives have only been available to the gas supplier/coal converter. ICGS is nominally quite competitive to natural gas. However, the requirement to commit to a long-term contract for the ICGS system complicates the decision. If tax incentives for ICGS were available to the user in the form of credits for Btu's of syngas used, the economic benefits would be more obvious and promote more rapid ICGS implementation.

For users that are able to directly combust coal, tax incentives for ICGS use would expedite the "fuel switch" and offer more rapid environmental clean-up of these polluting systems while minimizing the economic impact of the additional "conversion" cost of the coal to ICGS fuel gas.

For the system provider of the ICGS, capital cost is a major issue. Investment tax credits would help to minimize the “conversion cost”, to the fuel gas user and therefore, facilitate the acceptance by the financial communities for conventional project finance.

VALUE TO INDUSTRY AND THE COUNTRY

- Reduce industrial dependence on natural gas or foreign LNG.
- Use the 225 year supply of US coal resources for a broad base of industrial plants.
- Help US industrial producers keep competitive with foreign competitors with cheaper synthetic fuel gas.
- Reduce industrial emissions.
- Allow industrial producers to stabilize energy prices over the long term without the high volatility of natural gas prices.
- Keep and create new US jobs.

NEEDED TO ACCOMPLISH BROAD ICGS IMPLEMENTATION

- Broaden the base of industries and applications in which EPACT 2005 and other legislation encourage the use of gasification technologies by removing restrictions as to the types of industry and ends use of the syngas produced
- Incent the ultimate gas user by providing incentives based on the amount of energy in Btu's obtained from coal gasification
- Adopt ICGS as Preferred Allowable Control Technology (PACT) to allow environmental regulators to more easily issue permits for fuel switching rather than the full new source reviews that could be required without PACT designation.

CONCLUSIONS

- ICGS can benefit a broad spectrum of US industries.
- ICGS can significantly reduce industrial pollution
- Additional broad based tax incentives available to the fuel user would expedite implementation of ICGS.
- ICGS can be a viable means of reducing US dependence on imported energy (oil and natural gas/LNG).

Thank you for the opportunity to testify before your committee and we would be happy to provide additional information if required.