Gasification:
The Future of Power Generation

Brian Ferguson
Chairman and Chief Executive Officer
Eastman Chemical Company

Gasification Technologies 2002

October 28, 2002
San Francisco, CA
Good morning. Thank you, Jim, for that introduction. I’d also like to add my personal welcome to our friends and colleagues from Australia, representing national and state governments, academia as well as industry. Welcome to the United States, and to the beautiful city by the bay, San Francisco.

Thanks to all of you for giving me the opportunity to talk with you today – to talk about a technology that we see as critical to our company, critical to our industry and, I believe, critical to our national energy security.

But first let me give you a little background on my company, Eastman Chemical Company.

We are a global company headquartered in Kingsport, Tennessee. We supply billions of pounds of chemicals, fibers and plastics to customers around the world for use in thousands of consumer products. Though we don’t make any consumer products, Eastman products touch millions of lives everyday. For example, they can be found in your plastic soda bottles. They’re in the lining of your business suits. And they’re in the paint on your walls at home and on your cars. Our products extend the shelf life of foods. They make your white clothes whiter. And they help make your garden hoses bend. We serve many diverse markets, such as pharmaceuticals, textiles, packaging, cosmetics, electronics, paint and coatings, and photography.

In addition to our broad range of products, we’re also known for our innovative processes and technologies. Our chemicals from coal facility, which is what brings me here today, is one of those innovative processes and technologies.

We are recognized as a leader in coal gasification performance. Our Kingsport facility has been producing chemicals-from-coal since 1983 – that’s nearly two decades of experience, and nearly two decades of very successful and reliable operation.

We knew the time for coal gasification had arrived after two major raw material disruptions in the 1970s – first the oil embargo and then the Iranian crisis a few years later. Those events quickly told us that we needed a more stable and secure energy source.

Today, as a nation, we need the same thing – greater energy security.

And there’s little wonder. The events of September 11 and more recently in Bali, Indonesia proved that the world is increasingly vulnerable. And it’s not just terrorism, or the threat of a nuclear device or biological warfare. In a world where markets can be disrupted in an Internet second, secure energy supplies and reliable sources of raw materials are increasingly critical.

The time has come – as a matter of fact, it’s long past due – for greater energy security through an energy policy that makes sense. One that reduces our dependence on imports, one that we can afford, and one that protects our environment.
Today I want to talk to you about energy security, and the important role that gasification can play in providing it.

Our country is facing an energy crisis, and we were facing a crisis even before the events of 9/11. I truly believe this. Let me explain why.

Our coal gasification plant is 19 years old and is really the pride of Eastman. This facility – running high sulfur coal – gives us a decided cost advantage against our peers in the chemical industry. Many of them rely on natural gas as a raw material and you all know how volatile those prices have been in recent years, skyrocketing at times. But we at Eastman are blessed with a relatively cheap and abundant raw material source…coal, from our neighboring states of Kentucky and Virginia.

Even with coal as part of our mix, in 2000 our energy costs were up $380 million over the previous year …and that was before the escalations of tensions in the Middle East. That’s $380 million in just 12 months.

From where I sit, taking $380 million dollars off of our bottom line is pretty severe. But when you realize that every manufacturer in the U.S. is facing the same problem or worse, you see the implications are ominous.

The National Association of Manufacturers estimates that higher fuel prices between 1999 and 2000 cost the U.S. economy more than $115 billion. That’s equal to a full percentage point off our Gross Domestic Product. That’s a huge drag on an already suffering economy.

If this were a one-time blip – if energy prices had spiked because of some anomaly – I might not be so concerned. It might not be a crisis. But when the best forecasts indicate that electricity demand is continuing to grow faster than the building of new electricity supply, the problem is becoming a crisis.

It’s a crisis we Americans are finally starting to see. It’s not the oil embargo crisis of 1973 and 1974. It’s not the Iranian upheaval of 1979 that means long lines at the gas station. This one threatens to put people in long lines at the unemployment office. Higher costs threaten America’s competitiveness and mean less money for capital projects, R&D and even expansions.

And it’s not just businesses that are suffering. Consumers also felt the sting of the sharp increases in oil and natural gas prices of 2000 and 2001, which I believe contributed to our economic slowdown. And citizens of this state can tell you first-hand stories of their energy crisis experiences.

While the California crisis has abated, and oil and gas prices have come down some from their peak levels, we know that these are only short-term respites. We need a long-term solution. The good news in all of this is that these price spikes and energy disruptions
have crystallized the need for energy security, and they have caused Americans to develop a consensus for a clear energy policy in the U.S.

The question is, where do we look for raw material supplies? We can’t drill our way to prosperity in this country. Drilling in the Artic Wildlife Refuge is problematic at best. Even if Congress does eventually agree to allow it, any resulting crude oil supplies will be years away.

Nuclear power provides some hope, although I certainly wouldn’t want to be the one to try to propose a new one in the U.S. today.

Natural gas doesn’t provide the answer, either. For one, its supply is limited in the U.S. Some experts predict the depletion of all domestic reserves to occur within the next 40 years. And as supply declines, rates are expected to increase. Price swings make natural gas too volatile to be relied upon, especially if you’re a chemical company. We can’t pass along these increased costs to customers. For our industry, this often means suspended production and lost earnings. This does not only have a serious impact on us, but on the entire U.S. economy.

That leaves alternative energies like wind and solar power. These are fine for niche applications. But for a national policy, we need to depend on something that’s more abundant and that’s inexpensive.

For Eastman, coal is an affordable, obvious choice. The same is true for our nation.

The United States is a coal-rich country. We have more than 250 years of proven recoverable reserves. We have significantly more domestic reserves of coal than we do either natural gas or oil. The Appalachian Mountains that I call home could easily be considered the OPEC of coal.

It is abundant. It is economical. But, coal has many detractors – detractors who proclaim it to be dirty, and say it is harmful to the environment. Before it will be taken seriously as part of a national energy policy, coal must also be seen as a clean source of power.

Enter gasification.

As we’ve proven for nearly 20 years, coal gasification is a clean coal technology. It’s the cleanest coal technology you can use. It has, for example, inherently low air emissions – the lowest sulfur dioxide, nitrogen oxide, and particulate matter emissions of all coal-based technologies for generating power.

In the past 30 years, the United States has increased its use of coal to generate electricity by almost 200 percent.
During this time, the rate of emissions of sulfur dioxide, nitrous oxide and particulate matter have dropped, and dropped significantly.

So while the use of coal to generate electricity has dramatically increased, emission rates of the key air pollutants associated with coal have dramatically decreased. That tells me that, through regulation and new technology, we’re learning how to use coal far more efficiently than we used to.

With gasification, air emissions are far below the levels mandated by the U.S. Clean Air Act. It produces less carbon dioxide per kilowatt-hour – demonstrating its superior efficiency compared to other types of coal-based power generation plants. Gasification also offers the opportunity to capture carbon dioxide, and to do it for significantly less cost than other fossil fuel-based technologies.

Mercury emissions are low – and the system can remove very high levels of volatile mercury from the syngas stream at a fraction of the cost for other coal-based technologies. In fact, we have practiced such inexpensive and effective mercury removal at our Kingsport gasification facility for almost two decades.

But the benefits of gasification don’t stop with reduced air emissions.

The process produces a number of commercially viable by-products – like high-purity sulfur or sulfuric acid, captured carbon dioxide, and a slag by-product used in road fill, brick manufacture and roofing shingles, just to name a few examples.

Competing technologies -- such as fluidized bed combustion and supercritical pulverized coal boilers -- generate large amounts of waste. Gasification removes almost all of the sulfur while generating a fraction of the waste associated with the other technologies – and the solid wastes here are typically inert and reusable. Gasification also effectively destroys most hazardous materials, including dioxins and PCBs.

In addition to gasification being cleaner than these competing coal technologies, it’s also competitive in cost. And, as environmental regulations become more and more stringent, gasification’s cost advantage grows even greater.

For those that would argue that this technology is too new to be reliable, I would invite them to our plant in Kingsport. We’ve proven that it’s reliable. I mentioned that we have many years of experience running one of the premiere coal gasification plants in the world. What I didn’t tell you was how well we ran it. We have run continuously online in excess of 98 percent of available time since 1984 using a hot standby gasifier and could run online 90 percent of the time using only a single-train gasifier. Our forced outage rate is only 1%. We typically operate our gasifiers significantly better than their original design rate. And we’ve accomplished all of this while lowering our maintenance costs by a third in the past 5-6 years. This is one of the best records in the industry.
For Eastman, gasification has proven to be clean and reliable. It’s also proven to have another, very important benefit – it’s flexible. And this country needs all of the energy flexibility it can muster.

Gasification processes like ours are designed to be extremely adaptable. It has the potential to accept a wide variety of carbon-containing materials – a broad range of coals, petroleum coke, refinery residue streams, oil, natural gas, biomass and chemical wastes. The key is carbon – and gasification converts virtually all the carbon in the feedstock to syngas. We also have the ability to blend certain feedstocks in combination with coal.

When economic conditions change, or when the availability of a raw material becomes an issue, we can adapt the process to accept alternate feedstocks. Most other coal-based technologies are not readily adaptable. And petroleum-based technologies are even less adaptable.

This kind of flexibility is crucial to national energy security. The upheaval in the Middle East is not going to be settled any time soon. And as long as it continues, the United States has to contend with the reality of vulnerability of our energy supply. Gasification can play a major role here, enabling the use of our vast U.S. coal reserves, and at a time when they are most needed.

Gasification can be used to generate power, steam, hydrogen, chemicals or fuels – or combinations of these – depending upon what the process or project requires, or what the country needs.

At Eastman, we’ve learned that energy security means more than having a secure energy supply. It means having secure, reliable energy processes…processes that can utilize a variety of feedstocks…that can be adapted at minimal cost…that can provide a variety of products and that can, in fact, produce clean, inexpensive electricity if a critical need arises.

Environmental protection, reliability, flexibility – these benefits of gasification have meant energy security for Eastman for the past 20 years. These are valuable lessons that we’ve learned from direct, hands-on experience. These are valuable lessons the rest of the nation can benefit from as well.

We have a technology from the middle of the 20th century that can make the 21st century more stable and more secure. And every day, we’re realizing just how important that is. The case for energy security is being made daily.

It is made from the caves and mountains of Afghanistan.

It is made from the latest bombing in Israel, or Indonesia or the Philippines.
It is made every time we hear of the latest threat from Iraq, every time a war or rumor of war creates a spike in the cost of oil. Or every time the government issues a Code Orange alert to American citizens on American soil.

As Mideast tensions continue, as the United States increasingly emphasizes homeland security, and as environmental regulations continue to tighten, gasification is increasingly seen as more than a technology, more than a business, more than a competitive advantage. It is the future for power generation, and we intend to be an important part of that future.

So much so that within Eastman we have launched a Gasification Services business to help make gasification more attractive as a technology. We are stepping forward to do our part to make gasification a realistic solution to our nation’s energy security concerns.

# # #