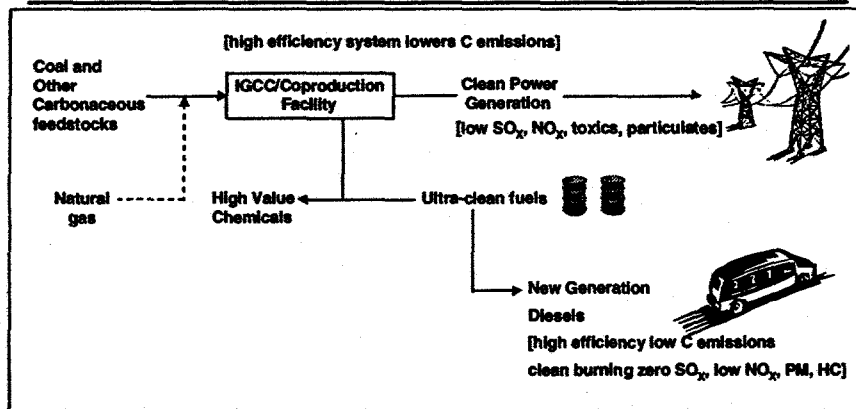
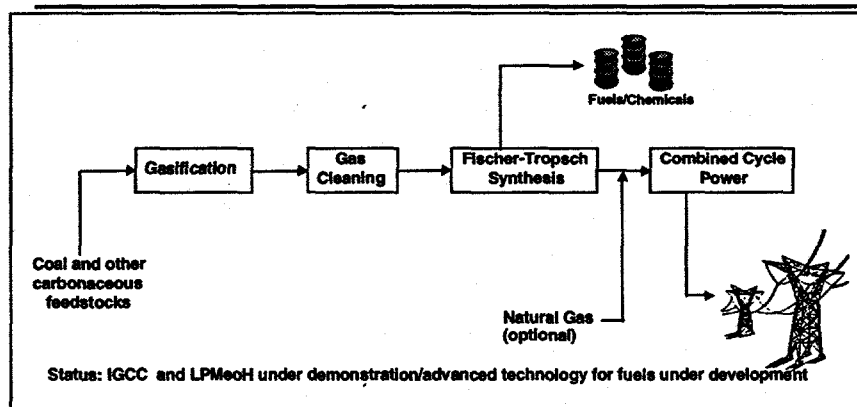


APPENDIX 1

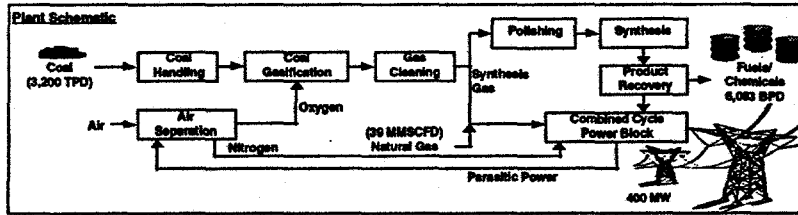
Coproducts Integrated into a Power/Fuels/End-Use System is an option



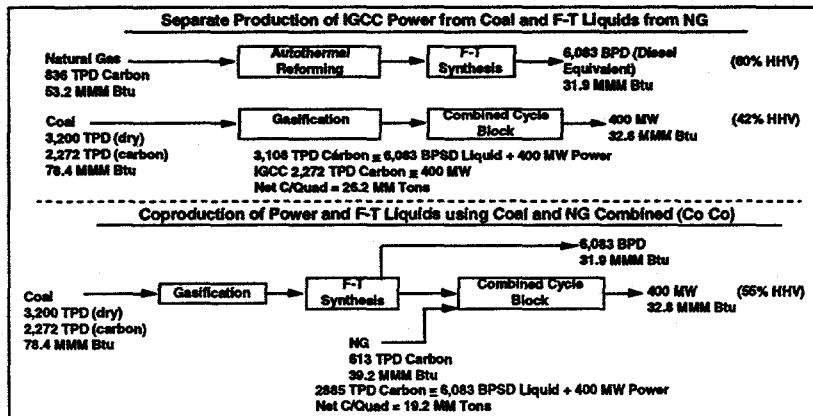
Coproducts Cofeed Concept Schematic (Co Co)



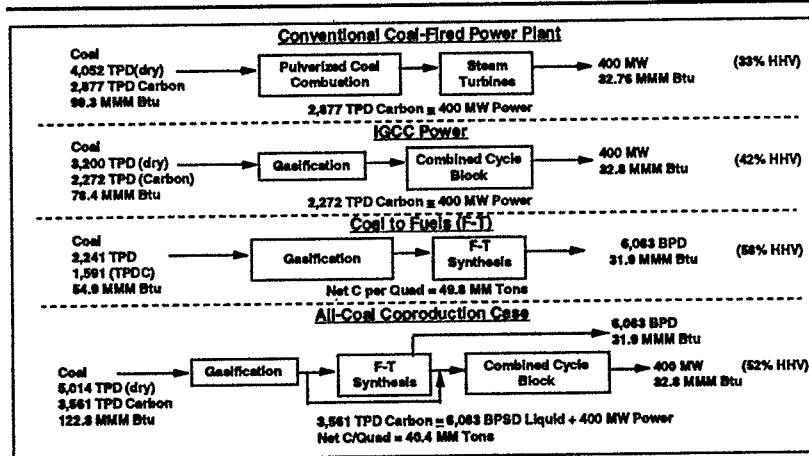
Coproduction Cofeed (Co Co) Configuration



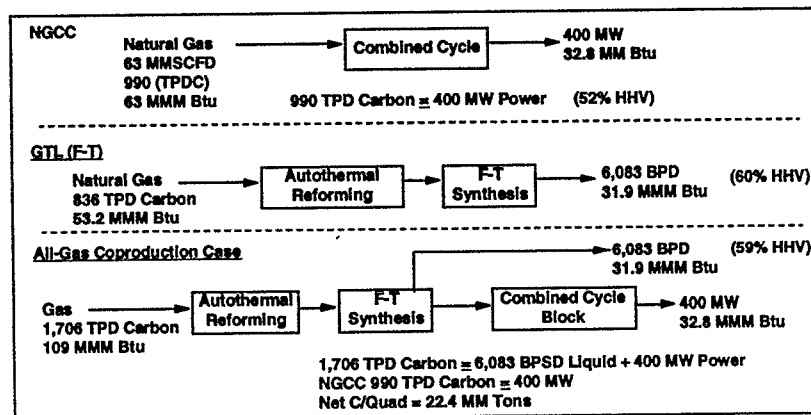
Separate Production vs. Coproduction of F-T Liquids and Power



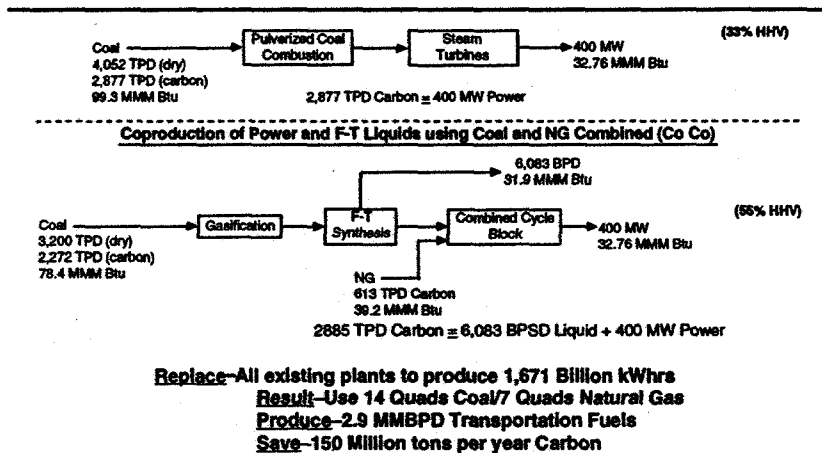
Coal-Based Energy Conversion Systems



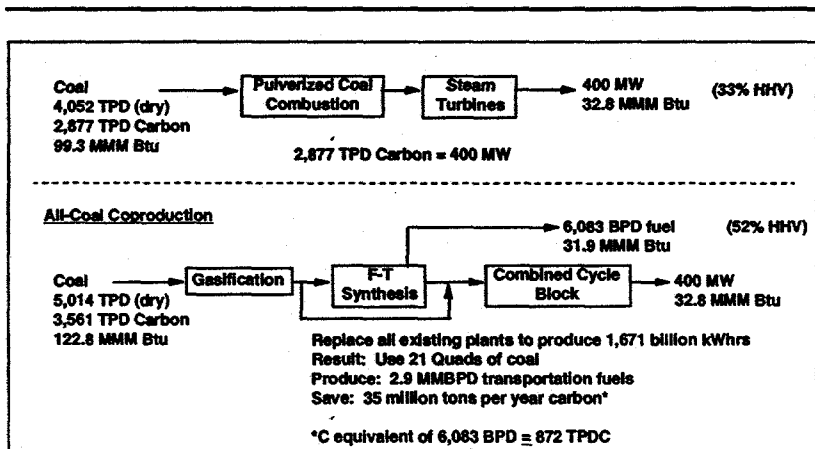
Natural Gas-Based Energy Conversion Systems



National Implications of Deployment of This Technology



National Implications of Deployment of this Technology



Coproduction: Environmental/Energy Security Benefits

- Replacement of one 400 MW PC plant with coproduction (NG option) would reduce carbon emissions by 350,000 tons every year
- Replacement of all U.S. PC plants with coproduction (NG option) would reduce carbon emissions by 150 million tons every year (30% of expected carbon emissions increase by 2020) and coproduce 2.9 MMBPD of transportation fuels
- High quality F-T fuels from coproduction significantly reduce CO, HC, PM, and NO_x and eliminate SO_x
- F-T diesel could meet expected 2004 fuel emissions regulations
- Coproduced IGCC power is generated with minimal environmental impact

Coproduction: Economic Benefits

- Return on Equity comparisons
 - IGCC (\$1500/kW) ~1%
 - NGCC (\$580/kW) ~15%
 - CoCo (\$1500/kW) ~8.5%
 - Coal Copro (\$1500/kW) ~5.5%
 - CoCo (\$1200/kW) ~15%
- For current \$1500/kW IGCC technology CoCo can realize 15% RoE by selling power @27 mills/kWh and fuels @~\$28/bbl (19 cents/gallon incentive)
- For \$1200/kW IGCC technology CoCo can realize 15% RoE by selling power @25 mills/kWh and fuel @~\$20/bbl (no incentive necessary)

APPENDIX 2

OUTLINE FOR THE IGCC MARKET PENETRATION STUDY

Client:

The client for this study is the Department of Energy (DOE) Office of Coal Power Systems, Integrated Gasification Combined Cycle (IGCC) Product Team. DOE overall study coordinator Gary Stiegel, FETC. (Tel 412 892 4499) DOE IGCC Product Team coordinators: Julianne Klara (Tel 412 892 6289) and Diane Madden (Tel 412 892 5931). The Contracting Officers Representative (COR) for this project is Mike Baird (Tel 412 892 4472).

Period of Performance:

June 1998 to December 1998.

Objective:

The overall objective of this study is to provide the necessary information, rationale, and framework so that the client can develop a strategic and defensible marketing plan for commercial deployment of IGCC technologies in the U.S. and overseas. Specifically this study will attempt to estimate the market potential of IGCC between now and the year 2020 in power generation, coproduct applications, and niche markets.

Work Plan:

1) Free Market (non-policy) scenarios:

The Energy Information Administration (EIA) Annual Energy Outlook (AEO)'98 reference case will be used as the baseline with respect to forecasts of national and regional power demand in the U.S. between now and 2020. (Regional demand forecasts are available in the supplement tables of the AEO report). This EIA baseline specifies power demand, feedstock costs, power price, etc. Under this baseline scenario 403 GW of total generating capacity will be required by 2020, of which 278 results from increased demand and 125 results from retirement of nuclear and older coal-fired plants. Under the assumptions of this baseline scenario, there is no market penetration of *advanced* coal power generating capacity.

Using this baseline to determine power demand and the cost of electricity as the benchmark, a regional comparison will be made to determine the cost competitiveness of natural gas combined cycle (GCC) and advanced coal plants like Integrated Coal Gasification Combined Cycle (IGCC) for power generation. For a fixed set of financing

assumptions, compatible with anticipated power industry project evaluation criteria in a deregulated market (determined by input from industry, results of the Energetics study, and DOE), the impact of feedstock cost (natural gas and coal), capital investment (technology and location-adjusted), capacity factor, and performance (efficiency) on the relative economics of GCC versus advanced coal plants for power generation will be analyzed. This analysis will result in determination of target parameters for advanced coal competitiveness.

This analysis will then be extended to illustrate the impact of economic dispatch of advanced coal-fired (power generation/coproduction) systems and GCC for a single typical utility system. This dispatch analysis will consider the operating cost and availability of new and existing units.

The impact of coproduction (systems producing fuels/chemicals in addition to power) and coproduction/cofeed systems that use coal and gas to produce multiple products will also be analyzed. Repowering of existing plants will also be considered as a possible factor to reduce costs and facilitate deployment.

The baseline advanced coal IGCC system to be used in this analysis has been developed by Mitretek and modified to be consistent with the baseline developed by EG&G for DOE. This baseline uses a Texaco quench gasification system with conventional gas cleaning, a Westinghouse W501G gas turbine, and a sophisticated steam cycle to produce about 400 MW net power. System performance improvements and cost reductions to this baseline will be assumed and justified in this analysis. It is proposed that a performance/cost estimate for a bituminous (Pittsburgh Seam) and a subbituminous (PRB) coal be developed to account for eastern and western U.S. markets.

2) Policy-induced scenarios:

In the reference EIA forecast for power generation between now and 2020, total domestic electricity demand increases by 39 percent from 3191 billion kWhrs to 4459 BkWhrs. During this period, nuclear generation declines by 43 percent and renewables generation remains essentially unchanged. Therefore the increased demand must be satisfied by using natural gas and coal. Although natural gas use for power generation increases 380 percent (from 3 to 10 quads) by 2020, coal utilization must still increase 29 percent (from 18.4 to 23 quads). By 2020, coal is still providing over 50 percent of domestic electricity generation. Clearly, then, both coal and natural gas will be needed to provide this power.

However, it may be necessary to implement policies that will induce deployment of advanced coal technologies rather than conventional coal-fired plants or the increased utilization of existing coal-fired power plants. The following policy inducements will be considered in this analysis. 1) Financial incentives given to reward investors for deploying highly efficient coal-based systems. The financial incentives to be considered include investment tax credits, accelerated depreciation and subsidies (excise tax exemption) for coproduced fuels or chemicals. 2) Environmental incentives including the imposition of a

carbon tax on fuels and more stringent regulations on NOx etc. In this analysis, different levels of carbon tax would be investigated to assess the impact of this on the relative deployment of technologies. Stricter environmental regulations which severely penalize emissions (for example NOx, particulates) would also be investigated. 3) A restriction on the amount of natural gas available for new power generation. In this analysis, the available natural gas for power would be constrained to be 10 quads (EIA projection in reference case by 2020) and the impact of this on deployment of advanced coal technologies for the various assumptions of costs and performance will be examined. This analysis would, therefore, provide a relative cost per carbon saved for the various forcing mechanisms.

3) IGCC versus other advanced coal technologies:

Review potentially competing advanced coal-based technologies including advanced PC, PCFB etc. for a representative region and identify those characteristics that could favor IGCC. These would include flexibility of IGCC with respect to coproduction configurations, ability to meet or exceed future, more stringent environmental regulations, applicability to Vision 21 configurations, etc. Strengths and weaknesses of IGCC systems will be identified.

4) Niche market and overseas deployment opportunities for gasification technologies:

Review and summarize current worldwide activities using gasification technologies in other industries (most particularly in refining) for a variety of feedstocks and for various products. Emphasis on flexibility of gasification with respect to feedstock and products, and how experience gained in these applications feed back to improving performance and reducing costs in power applications. Analyze opportunities that could exist for IGCC deployment overseas in developing and developed countries, including the impact of incentives such as the clean development mechanism (CDM).

Study working team:

It is proposed to incorporate significant input from industry in performing this study to improve overall credibility and to provide feedback from stakeholders. Mitretek intends to subcontract with CONSOL to help in this work and has joined the Gasification Technologies Council (GTC) to obtain input from GTC member companies.

APPENDIX 3

**UPDATE OF SUMMARY OF COAL-FUELS/GTL STRATEGIC PLANNING
SESSION
24/25 JUNE 1998, FETC PITTSBURGH
REVISED 9 JULY, DOE HQ**

Attendees:

The attendees at the 24/25 June meeting were:

Ralph Avellanet, Dan Driscoll, David Gray, John Hackworth, Greg Kawalkin, John Marano, Ed Schmetz, John Shen, Brad Tomer, Venkat Venkataraman, John Winslow.

This Strategic Planning Summary was revised at the DOE HQ meeting on 9 July, at that meeting the following were in attendance: Ralph Avellanet, David Gray, John Hackworth, Greg Kawalkin, Ed Schmetz, and Brad Tomer.

Goal:

Develop a framework for a comprehensive, credible strategy and implementation plan to justify a joint "coal-fuels/GTL" program within DOE for production of ultra-clean transportation fuels. This strategy will then be used to justify the program to DOE management, and for use in preparing an outreach strategy for outside stakeholders.

Why do we need this new strategy?

Because the current rationale and strategy has apparently failed to justify a need for the coal-fuels program with senior DOE management and potential stakeholders. There is a lack of constituency for this program and without a constituency it becomes increasingly difficult to maintain even the current modest budget.

Overall Approach:

The overall approach to this new strategy is to integrate the strategies of the Coal/Fuels and GTL programs within Fossil Energy. This integrated approach will lead to synergies and research efficiencies by recognizing the natural overlap between many aspects of the GTL and Coal/Fuels programs. Rather than base the programs on specific feedstocks like coal and natural gas, it is proposed to emphasize feedstock flexibility to produce common products. These common products are ultra-clean transportation fuels like F-T liquids and DME derivatives that fit the existing transportation infrastructure for refining, distribution and end-use and can meet future 2004 specifications for fuels. Strategic chemicals can also be produced if desired. As part of this overall strategy it is proposed to keep the existing alliance with IGCC intact so that an integrated system can be envisaged comprising coproduction of multiple products (fuels, chemicals, high value solid products,

and electric power) from multiple feeds like coal, natural gas, biomass, refinery wastes and residuals, MSW etc. This vision is ultimately consistent with the DOE Vision '21 concept.

Other fuel and non-fuel products such as solid fuels and carbon products (possibly heavy and extra heavy oils) and low quality natural gas upgrading will be included at a later date to provide a comprehensive fuels strategy.

Background:

Prior strategies are already in existence within both the Coal/Fuels and GTL programs, and a list of existing documentation was compiled and listed here.

“Coal Liquids: Clean Transportation Fuels of the Future,” May 1995, USDOE PETC.

“Rationale and Proposed Strategy for Commercial Deployment of Coal-Derived Transportation Fuels,” David Gray and Glenn Tomlinson, June 1996, Mitretek, MP96W0000209.

“Coal Liquefaction Product Plan,” December 1997, FETC.

US DOE Fossil Energy Strategic Plan, March 1998.

US DOE Strategic Plan, March 1998.

“Coal/Oil Coprocessing: Integration Opportunities with Existing Petroleum Refineries.” Oct 97, Mitretek.

“Fischer-Tropsch Fuels from Coal and Natural Gas, Carbon Emissions Implications,” Mitretek, August 1997.

US DOE FE multi-year program plan for coal.

US DOE FE multi-year program plan for gas.

“Natural Gas Processing and Utilization Product Plan,” Dec 97, FETC.

Two page defense materials for coal and gas prepared June 1998 for ASFE program defense.

Pioneer Plant Presentation, June 1998.

“Economics of Alaska North Slope Gas Utilization Options”, INEL-96/0322 April 1996

“Economic Evaluation and Market Analysis for Natural Gas Utilization,” Hackworth et al, April 1995

Multiyear Program Plan Natural Gas, prepared by FE, ER, EE, and EIA, Dec 1997

Oil and Gas R&D Program, Office of Natural Gas and Petroleum Technologies, March 1997

The key differences in the approach between this new strategy and prior strategies are:

- emphasis on product end-market orientation rather than specific feedstock
- emphasis on the benefits to be derived from the integration of the Coal/Fuels and GTL program strategies
- emphasize partnerships with EE and other offices within DOE

The key differences in priorities between past strategies and this current one are: (in order of importance by a majority opinion):

- **regional environmental** benefits of the products are to be emphasized
- **economic** benefits (employment, balance of payments, benefits to country and consumer) are issues to be stressed
- impact of **global climate change** to be more thoroughly addressed in this strategy compared to prior versions
- **energy security** aspects of the program rationale (preparing for eventual oil shortfalls, reducing dependence on foreign oil) are considered to be a secondary rationale for the program (although some team members felt that this was still an important driver for the program and is used by other groups within DOE for program justification.)

Product Planning Process:

To attempt to answer the question "where are we?" a **situation analysis** was conducted. First, the internal situation was examined by addressing the following issues:

Internal Situation:

- mandates
- technology options
- stakeholder analysis
- how well is current strategy working?

With respect to **mandates**, there was uncertainty.

Technology options

Technologies being developed or improved as a result of the current program. These included: slurry bubble column reactor (SBCR) development, Catalytic Two-Stage Liquefaction (CTSL), catalyst development, coproduction, advanced syngas preparation (Ionic Transport Membrane etc.), LNG, simulation and life cycle analysis, end-use product testing, biomimetic /computational chemistry, molecular and hydrodynamic modeling.

Potential Stakeholder identification:

potential stakeholders included: State of Alaska, coal producers, oil companies, petroleum refiners, equipment/technology developers, engine manufacturers, petrochemical industry, independent power producers and utilities, the consuming public, state and local governments, Congress, the Administration. (A stakeholder analysis may have to be performed in the future.)

Is the current strategy working?

This was addressed by examining the mission for the two programs (Coal/Fuels and GTL) and then defining the problems with the current strategy.

The Coal/Fuels Program:

The overall mission is to ensure a future secure supply of transportation fuels by fostering development and deployment of clean fuels from coal to supplement petroleum. This is to be accomplished by partnering with industry via a pioneer plant strategy for deployment of the technologies at existing facilities. The rationale for the program is to be a national insurance policy against potential future oil shortfalls by providing an alternative to imported petroleum from domestic resources that could also cap future increases in the world oil price (WOP).

Problems with this current strategy:

- the future oil shortfall argument is not accepted by most decision makers. This is particularly the case at present with an oil glut and low prices. However, it should be noted that many other alternative fuel programs (in EE, for example) use the future shortfall argument and reduction in oil imports as justification.
- the major problem is lack of a constituency. Coal companies ought to be stakeholders but they only see coal as a feed for power plants. Oil companies have little interest in supporting a product that could compete with petroleum. If the WOP increases oil companies reap the profits.
- global climate concerns over increasing the use of coal for uses in addition to power production
- high cost of the proposed technologies that result in synthetic prices that are non-competitive with petroleum even to the end of the planning horizon
- EIA future scenarios that show continued low prices (and no supply problems) for energy until 2020
- potentially cheaper alternative technologies to coal-derived fuels like EOR, heavy oil and bitumen upgrading
- image problem with coal-derived synthetic fuels

The GTL program:

The mission is to foster development options (with industrial partnerships) for stranded natural-gas. Domestically, the Alaska North Slope (ANS) is the identified opportunity and possible off-shore and coal-bed methane sites.

Problems with this current strategy:

- since industry is actively developing and beginning to deploy GTL technology worldwide, there is the question of the appropriate role for government in this arena
- a relatively small number of domestic opportunities for GTL

External Situation:

- competing technologies/products
- economic situation
- drivers
- politics
- laws/regulations

- opportunities/threats

Competing technologies

these were identified as (no priority order): conventional petroleum refining, EOR, heavy oil and bitumen upgrading technologies, LNG, renewable technologies for hydrogen and ethanol, fuel cells for transportation

Competing products:

these were identified as: reformulated gasoline and diesel and all other alternative fuels (EV, MeOH, EtOH, CNG, LNG, hydrogen), and heavy oil, bitumens, oil sands as alternative feedstocks.

External driving forces:

(These are prevailing external factors, beyond our control, that by their existence have a potential impact on the program, either positive or negative)

- **Environmental:**
 - concerns over global warming may impact the use of coal and reduce NG flaring
 - local regional pollution issues may result in stricter regulations/specifications for fuels and emissions
- **Economic:**
 - continuing world oil demand growth will increase future world oil price (WOP) and impact US economy and the balance of payments (BOP) situation
- **Energy Security:**
 - continuing decline in domestic oil production and hence rising oil imports will make the US more dependent on foreign oil from essentially unstable regions of the world
 - energy is essential for maintaining the current standard of living and for sustaining continued economic growth.

The next step in the process was to identify what **factors are essential for the success of the program.**

The Key Success Factor Necessary to the Program:

- **stakeholder (DOE, Congress, Administration, industry, consumers) interest crucial,** this requires developing a strong, credible, defensible reason (rationale) for this program. If a convincing argument cannot be provided for the existence of this program, then the perception is that the program is not necessary.

The argument for the existence of the program is that it can address all of the **external driving forces** identified above.

The program addresses the **environmental** drivers by:

- allowing domestic coal and gas to be used in efficient ways to produce liquid fuels in addition to power with greatly reduced greenhouse gas emissions
- allowing remote natural gas that cannot be brought to market or that otherwise would be flared to be used to provide high quality liquid transportation fuels
- producing liquid transportation fuels, compatible with the existing infrastructure, that are environmentally superior to current petroleum-based fuels that will significantly reduce regional pollution resulting from transportation (this gives product a premium to help counter high cost of production)

The program addresses the **economic** drivers by:

- fostering R&D to reduce the technological and economic risk of technologies that produce synthetics so that they can be deployed by industry in a cost competitive manner (product can eventually be cost competitive with alternative options and petroleum)
- providing an alternative to petroleum from domestic resources that could cap (or influence) the WOP, reduce the US balance of payments and improve the US economy

The program addresses the **energy security** drivers by:

- providing an alternate source of liquid transportation fuels from domestic resources that is potentially equivalent to over 1.5 trillion barrels of oil (100 Prudhoe Bays)

What are the barriers/weaknesses/threats that impede the program?

(These have been combined into one category in this rewrite to prevent confusing repetition)

- lack of constituency (stakeholders)
- lack of internal DOE management support
- program rationale not convincing to potential stakeholders
- role of government disputed by industry (especially for the GTL program)
- lack of funding and competition with power program in DOE for funding
- global climate change (carbon emissions), concern over increased use of coal
- high cost of technologies for synthetics compared to other alternatives
- perception of continued plentiful and cheap supplies of oil and gas
- bad public perception of increased coal use and diesel fuels and engines
- uncertainty in future regulations for fuels/emissions
- limitations of natural gas resource
- option to use military to secure oil supplies

These are not prioritized.

What are the strengths and opportunities that assist the program?

(Again, these are combined in this one category to eliminate repetition)

- program is developing flexible, versatile, high efficiency technologies that produce ultra-clean transportation fuels and other coproduced energy products from domestic resources, that are compatible with existing infrastructures, from multiple feedstocks with minimal environmental impact. This fits into the future Vision 21 concept.
- program addresses energy security concerns (reduces imports) by providing an alternative source of transportation fuels from domestic resources that is potentially equivalent to over 1.5 trillion barrels of oil (100 Prudhoe Bays)
- program addresses environmental concerns by producing high quality fuels from coal and natural gas with significant reductions in carbon emissions
- program allows remote natural gas that cannot be brought to market or that otherwise would be flared to be used to provide high quality liquid transportation fuels
- program produces liquid transportation fuels, compatible with the existing infrastructure, that are environmentally superior to current petroleum-based fuels that will significantly reduce regional pollution resulting from transportation
- program has partnerships with other DOE programs like EE, IGCC
- Alaska supports the GTL program because of ANS opportunity for GTL
- program helps US in global markets (competitiveness)
- program boosts US technological leadership
- program fosters waste utilization (petroleum coke etc.) as feedstocks
- program fosters opportunity for deployment of direct liquefaction in China
- program provides significant economic benefits resulting from creation of a domestic industry
- program fosters R&D to develop new and improved technologies (AFDU, ITM etc.) and to reduce the technological and economic risk of technologies that produce synthetics so that they can be deployed by industry in a cost competitive manner (product can eventually be cost competitive with alternative options and petroleum)
- program provides an alternative to petroleum from domestic resources that could cap (or influence) the WOP, reduce the US balance of payments and improve the US economy

These are not prioritized.

The next step in the planning process was to list the **Planning Assumptions** that form the base assumptions for the remainder of the program plan.

Planning Assumptions:

- fossil fuels remain an important energy source well into the next century
- global warming will continue to be an issue that must be addressed
- demand for ultra-clean transportation fuels will increase
- regional environmental regulations will become more stringent

- transportation sector continues to be a significant contributor to environmental problems
- domestic oil production continues to decline and oil imports continue to increase
- renewable energy is not a significant player between now and 2020
- a sufficient quantity of synthetics can influence the WOP
- synthetics can play a role in energy security
- large volumes of ANS gas available in 2010
- no single solution exists to the problem (this program will not solve all problems other programs are also needed)
- stakeholder participation crucial to program success
- negative public perception to coal and diesels continues to be prevalent
- appropriate government role in this program needs to be defined and agreed on by industry
- a significant number of key decision makers continue to believe in the continued unlimited availability of cheap oil and gas.

Mission Statement for the Advanced Fossil Energy Fuels Program:

The mission of the advanced fossil energy fuels program is to ensure a stable, affordable supply of energy for the U.S. by fostering, in partnership with industry, the development and deployment of a new generation of transportation fuels technologies from domestic fossil resources and wastes. These technologies will be capable of producing fuels:

- 1) that are compatible with the existing transportation system infrastructure
- 2) that, when used in advanced engine systems, will surpass future transportation fuel emissions requirements for reductions in hydrocarbons, nitrogen oxides, sulfur oxides, carbon monoxide, and particulates
- 3) that will enable the efficiency of the current vehicle fleet to be increased from 20 to 40 percent
- 4) that are cost competitive with petroleum and other alternative fuels.

The program will also provide cost competitive options for producing strategically important chemicals and advanced carbon products for lightweight vehicles and hydrogen storage from domestic coal and waste carbonaceous materials.

APPENDIX 4

ENERGY EFFICIENCY FORUM

ENERGY EFFICIENCY AND CLIMATE CHANGE: THE NATIONAL DEBATE

I attended the Energy Efficiency Forum at the National Press Club in Washington DC on Wednesday June 10. The subject of this year's forum sponsored by the United States Energy Association (USEA) was energy efficiency and climate change.

This was a real debate in that all sides of the issue; those totally opposed to the Kyoto Protocol (KP), those that were essentially neutral, and those totally for KP were represented. The most outspoken critics of KP included Jim Sensenbrenner (Chairman, Committee on Science, US House of Representatives) and Chuck Hagel (Senator from Nebraska) and cosponsor of the Byrd-Hagel motion. Those for the KP were Ambassador Eizenstat (Under Secretary for Business and Agricultural Affairs, Department of State) who was the prime US negotiator in Kyoto, Brian Atwood (Administrator US AID), and Hazel O'Leary (former Secretary of Energy).

Those opposed to KP:

Sensenbrenner holds the view that KP if ratified would be an unmitigated economic disaster for the US. He says KP is fatally flawed (because of non-participation by the developing countries who will be the greatest polluters in the near future) and cannot be salvaged. US industry would move operations and hence jobs to those developing countries who were not participants. Energy prices, and hence all goods and services, in the US would rise considerably and put the US at an unfair disadvantage in the global economy. The scientific basis on which KP is predicated is uncertain and does not justify the drastic actions and economic disruptions called for in KP. If KP was brought before the senate for ratification it would not pass. The administration knows this and hence will not bring it before the senate. Without ratification by the US, KP could not come into effect anyway. He suggested that the European Union (EU) and China teamed up against the US so that the EU got to maintain its "bubble" and China did not have to sign on to KP. The major loser if KP was ratified would be the US because the US really would have to reduce its GHGs by over 30 percent, and this cannot be done in the KP target timeframe without unacceptable social and economic disruption in the US.

Senator Hagel holds very similar views concerning KP as Sensenbrenner. He stated that he is not opposed to the objective of improving efficiencies and reducing pollutants but he is totally opposed to the command/control approach of the KP. All rational people (including US Senators) wanted to live in a clean, efficient world and leave this legacy to their children. He thinks the science is flawed and that models cannot predict future climate trends. These same modelers were predicting global cooling a few years ago. His

main concern is that KP would allow the developing world, especially China and India, to take no action to reduce their GHGs while the US and other OECD countries would have to disrupt their economies in order to comply. This would amount to a huge redistribution of wealth between rich and poor countries with the US being penalized for having the greatest economy in the world. It would also mean sacrificing US hegemony to the United Nations. Hagel believes that Eizenstat gave the store away in Kyoto by not sticking to the original terms of negotiation. The mood of the US senate towards KP is documented in the overwhelming bipartisan (95 senators signed on) support for the Byrd-Hagel motion that states that the US will not ratify KP unless developing countries sign on and it can be shown that there will be no significant economic harm to the US.

Those supporting KP:

Ambassador Eizenstat is obviously a staunch supporter of KP and was responsible for negotiating the terms of the US participation at Kyoto (7 percent below 1990 levels etc.). He strongly believes in the science behind KP and believes that the devastating impacts of global warming are irreversible. He stated that, if we fail to act now to curb these impacts, our children will blame us for essentially destroying our planet. He says that thousands of scientists and experts worldwide have massed sufficient evidence to support that facts that temperatures are rising, that there are more frequent catastrophic weather events, and that manmade emissions of GHGs are the culprit. He also believes that the KP provides for realistic reduction targets and timetables. Other benefits of complying with KP for the US include reducing imports of oil that would improve our trade balance and reduce our dependency on potentially unstable sources of supply. He sees KP as an insurance policy against future devastating climatic events. We can pay a smaller premium now to address the problem, or wait until later when climate change effects intensify causing us to pay a much larger premium in the future. He believes in enhancing our national energy security position by energy diversification. He is a supporter of increased use of nuclear power. He mentioned the Presidents climate initiatives and the \$6 billion allocated for credits for improved technologies. (However, I believe that much of this money is tied to the tobacco bill that may not pass). He does not believe in taxes on fuels as an option to reduce consumption. He says that the administration will not submit KP to the senate until there is a chance for ratification.

Brian Atwood believes that efficiency in energy use should be the goal even if climate change were not a problem. He obviously supports the administration line on the KP. He believes wholeheartedly in the science behind global warming, that there will be serious climate effects in the future and we already there are more frequent tornadoes etc. He thinks it is a serious problem and connects El Nino to climate change and anthropogenic GHG emissions. He also thinks that developing countries must dramatically reduce environmental impact per unit of added prosperity as they race towards standard of living improvements.

Hazel O'Leary is supportive of KP and says the challenge is to muster more general support for complying with KP.

Energy Secretary Pena gave the luncheon address. His very upbeat message was that energy efficiency and technologies and solutions to global climate change are not only good for the world but they are also good for business.

Neutral to KP:

The other speakers did not generally address KP but were positive towards concepts for improving energy efficiency.

Cecil Underwood, Governor of West Virginia, described how his state of WV was working towards improving efficiency in the use of state coal and gas resources. He is bullish on natural gas vehicles, and he mentioned his Main Street and Industries of the Future programs.

Other speakers included: Thomas Rotticci from Bank of America (soon to be the largest US bank after its coming merger with Nations Bank), who stressed BoA's commitment to energy efficiency in its operations; Peter Coy from Business Week, and Richard Sandor from Environmental Financial Products, who thought that climate change was not a problem and could be readily solved using market based carbon trading solutions rather than command and control approaches.