Early Entrance Coproduction Plant

Phase II - Quarterly Report No. 12

Reporting period: July 1, 2002 – September 30, 2002

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DOE Cooperative Agreement No. DE-FC26-99FT40658

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Disclaimer:

Abstract:

The overall objective of this project is the three phase development of an Early Entrance Coproduction Plant (EECP) which produces at least one product from at least two of the following three categories: (1) electric power (or heat), (2) fuels, and (3) chemicals. The objective is to have these products produced by technologies capable of using synthesis gas derived from coal and/or other carbonaceous feedstocks.

The objective of Phase I is to determine the feasibility and define the concept for the EECP located at a specific site; develop a Research, Development, and Testing (RD&T) Plan for implementation in Phase II; and prepare a Preliminary Project Financing Plan.

The objective of Phase II is to implement the work as outlined in the Phase I RD&T Plan to enhance the development and commercial acceptance of coproduction technology that produces high-value products, particularly those that are critical to our domestic fuel and power requirements. The project will resolve critical knowledge and technology gaps on the integration of gasification and downstream processing to coproduce some combination of power, fuels, and chemicals from coal and/or other carbonaceous feedstocks.

The objective of Phase III is to develop an engineering design package and a financing and testing plan for an EECP located at a specific site.

The project's intended result is to provide the necessary technical, economic, and environmental information needed by industry to move the EECP forward to detailed design, construction, and operation.

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The Contractor can not confirm the authenticity of the information contained herein since this report is being submitted under the U.S. Department of Energy requirement that the electronic files must be submitted without being write-protected.

Note: Unless specified otherwise, all quarters/years are calendar quarters/years.

I. List of Figures

The following figures were used in this report:

II. List of Acronyms

AFDU	Alternate Fuels Development Unit
AGR	Acid Gas Recovery
ASU	Air Separation Unit
BCR	bubble column reactor
Btu	British thermal unit
Btu/scf	British thermal unit per standard cubic feet
CFCMS	carbon fiber composite molecular sieve
CO_2	carbon dioxide
CO	carbon monoxide
DOE	U.S. Department of Energy
EECP	Early Entrance Coproduction Plant
ESA	Electrical Swing Adsorption
F-T	Fischer-Tropsch
GE	General Electric
IGCC	Integrated Gasification Combined Cycle
ILT	Integrated Laboratory Technologies
KBR	Kellogg Brown & Root
l/m	liters per minute
MDEA	methyldiethanolamine
MTC	Montebello Technology Center
ppmw	parts per million-weight
psi	pounds per square inch
ORNL	Oak Ridge National Laboratory
RD&T	Research, Development, and Testing
SBIR	Small Business Innovative Research
stpd	short tons per day
SwRI	Southwest Research Institute
TEMA	Technology Marketing
TESI	Texaco Energy Systems Inc.
wt %	weight percent

III. Executive Summary

This is the seventh quarterly report which summarizes the progress of Phase II of the development of the Early Entrance Coproduction Plant (EECP) being performed under U.S. Department of Energy (DOE) Cooperative Agreement No. DE-FC26-99FT40658. The EECP will integrate advanced high efficiency, fuel flexible electrical power generation with a coproduction facility capable of producing clean transportation fuels and/or chemicals. An industrial consortium consisting of Texaco Energy Systems Inc. (TESI), Kellogg Brown & Root (KBR), General Electric (GE), Praxair, and Rentech is developing this project.

In the proposed EECP, approximately 1,235 short tons per day (stpd) petroleum coke is used to produce 55 megawatts of net electric power for export, approximately 617 barrels per day of Fischer-Tropsch (F-T) products (finished high-melt wax, finished low-melt wax, hydrotreated F-T diesel, and hydrotreated F-T naphtha), steam, and approximately 89 stpd of sulfur. Additionally, the Air Separation Unit (ASU) will produce excess nitrogen and oxygen that will be exported.

The Phase I objective was to determine the feasibility and define the concept for the EECP located at a specific site, develop a Research, Development, and Testing (RD&T) Plan, and prepare a Preliminary Project Financing Plan. Phase I was completed in December 2000 and the final Phase I Concept Report was issued in May 2001. In Phase I, a typical refinery site, Motiva Port Arthur, was identified as the potential EECP site. As a result of the merger between Texaco and Chevron, Texaco was required to sell its interest in the Motiva Enterprises LLC joint venture to Shell Oil Company and Saudi Refining Inc. In late 2002, the team will evaluate the impact of moving the proposed EECP to a ChevronTexaco refinery or utility.

The Phase II objective is to conduct the research as outlined in Phase I and was originally scheduled for two calendar years (2001 through 2002). The revised target for Phase II completion is the fourth (4^{th}) calendar quarter of 2003.

The major schedule deviance in Phase II remains Task 2.5: Product Upgrading. The deviance is caused by delays experienced in preparing and cleaning the material collected at the LaPorte Alternate Fuels Development Unit (AFDU). The preparation of F-T product upgrading feed material from wax product collected at the LaPorte AFDU is outside the scope of the EECP. However, during this reporting period, F-T wax meeting the standard required for Task 2.5 vendors was produced by TESI. The F-T wax is scheduled for delivery to Bechtel and ChevronTexaco Integrated Laboratory Technologies (ILT) in November 2002. The preparation of the LaPorte AFDU wax product has delayed the start dates of Lab Batch Fractionation (2.5.2), Wax Hydrocracking (2.5.3), Wax Finishing (2.5.4), Diesel Blending (2.5.6), Wax Fractionation (2.5.8), and Fuel/Engine Performance and Emissions (2.6).

The final Carbon Dioxide (CO_2) Stripping from Methyldiethanolamine (MDEA) at Medium Pressure Topical Report (Task 2.8) was issued and approved by the DOE in the third (3^{rd}) calendar quarter of 2002.

The Phase III objective is a one-year effort scheduled to begin at the conclusion of Phase II. An engineering design package, testing plan, and financing plan for the EECP will be developed in Phase III. The overall project's intended result is to provide the necessary technical, economic, and environmental information needed by industry to move the EECP forward to detailed design, construction, and operation.

III. Results, Discussion, and Preliminary Conclusions

The EECP Annual meeting is scheduled for October 8, 2002 in Houston, Texas.

Task 1 Project Management
Task completed.

Task 2.1 Pilot Plant Confirmation
Catalyst regeneration/rejuvenation testing (Task 2.1.1) had been split between Rentech's Denver, Colorado laboratory and ChevronTexaco's Bellaire, Texas laboratory. Four (4) F-T catalyst samples, identified as RI56, RI59, LP18, and LP19, were selected for catalyst regeneration/rejuvenation testing at both facilities.

TESI completed testing on the last of the four (4) catalyst samples during this reporting period. As mentioned in previous reports, the four (4) regeneration/rejuvenation tests being conducted at Bellaire include:

a. "Baseline" test to determine initial catalyst activity.
b. "Nitrogen stripped" test in which the catalyst undergoes a one-hour heat up in nitrogen at the standard reaction temperature; reactivation with synthesis gas; and, testing at standard conditions.
c. "One hour hydrogen reduction" test in which the catalyst undergoes one hour of hydrogen reduction at the standard reaction temperature; reactivation with synthesis gas; and, testing at standard conditions.
d. "Three hour hydrogen reduction" test in which the catalyst undergoes three hours of hydrogen reduction at the standard reaction temperature; reactivation with synthesis gas; and, testing at standard conditions.

Of the four (4) catalyst samples tested, only LP19 showed a significant change in carbon monoxide (CO) conversion when compared to the baseline conversion (test a, above). The increase in CO conversion was observed for the "nitrogen stripping" test (test b, above). The CO conversion increase may be due to the nitrogen removing F-T wax from the active sites of the catalyst.

Testing at Rentech has focused on solvent extraction of the F-T wax from the catalyst, reoxidation of the F-T catalyst, followed by reactivation with synthesis gas and testing at standard conditions. Rentech is using a solvent to remove the wax from the F-T catalyst of the same four (4) samples tested by TESI (RI56, RI59, LP18, and LP19). Once the wax is removed, the F-T catalyst samples will be oxidized, reactivated with synthesis gas, and tested under standard conditions by Rentech. Rentech has completed testing on RI56. The sample showed no significant increase or decrease in CO conversion as compared to baseline catalyst.

During the first (1st) calendar quarter of 2002, TESI and Rentech began updating the Phase I F-T synthesis design basis. Rentech and TESI provided separate updated F-T design basis documents using their internal models that were developed outside the EECP Project. In April 2002, Rentech conducted a short bubble column reactor (BCR) test to provide additional data for updating the F-T design basis. In May 2002 the BCR test results and results from the Rentech and TESI F-T models were used to update the Phase II Pilot Plant Confirmation (Task 2.1.3) test plan.

The F-T Pilot Plant Confirmation test started in June 2002. The test was stopped after approximately four (4) days on stream when the addition of carbon dioxide (CO_2) to the feed gas unexpectedly caused the CO conversion to rapidly decrease. The CO_2 was added to the feed gas to simulate the actual feed synthesis gas composition from the gasification section. An analysis of the CO_2 gas revealed trace contamination from Freon.

The F-T Pilot Plant Confirmation test was completed in the third (3rd) calendar quarter of 2002. New CO_2 cylinders were tested for contamination prior to their use. Previously activated catalyst slurry was added to the BCR, using the Catalyst Addition System, to increase the slurry concentration of the BCR to approximately the EECP design basis. The BCR performance appeared to be reasonably consistent with the results predicted by ChevronTexaco's proprietary Mathematical Model (developed outside the EECP Project). The addition of the CO_2 in the feed gas did not adversely affect the performance of the catalyst.

Task 2.2 Mathematical Model and Reactor Scale-Up Confirmation

The TESI F-T model, developed outside the EECP Project, was used to develop the test plan for Task 2.1 (see above).

Task 2.3 Catalyst/Wax Separation

EXPORTech Company, Inc., New Kensington, Pennsylvania continued testing their proprietary separation device under their Small Business Innovative Research (SBIR) Grant (DOE Grant DE-FG-02-00ER83008). TESI intends to test the EXPORTech device for Alternate Primary Separation (Task 2.3.1). TESI and EXPORTech continued developing an agreement to demonstrate EXPORTech's proprietary separation device under the DOE EECP Project.

In the third (3rd) calendar quarter of 2002, Rentech and ChevronTexaco personnel witnessed additional tests for Secondary Catalyst/Wax Separation (Task 2.3.2) at LCI Corporation, Charlotte, North Carolina. The tests used F-T catalyst/wax taken collected directly from a proprietary primary separation device on the Rentech BCR and F-T catalyst/wax collected from a proprietary primary

separation device at the LaPorte AFDU. Both samples contain significantly more catalyst fines than was used in previous tests at LCI.

The initial tests at LCI used a feed material produced by activating fresh catalyst in Rentech's BCR and blending it with synthetic wax to produce a wax slurry composed of 0.5 wt % solids. The filtrate from that test met the EECP standards (less than ten parts per million-weight (ppmw) of solids). The 0.5 wt % catalyst / wax slurry used for above test was made up of a synthetic wax and activated catalyst that had full range of catalyst sizes. Normally, the feed slurry to the second stage of catalyst/wax separation device contains activated catalyst that is much finer in size.

Small scale testing of the LCI device at Rentech with F-T catalyst/wax slurry collected from the proprietary primary separation device were encouraging, however, due to equipment limitations, the flux was low. Therefore, additional tests in the third (3^{rd}) calendar quarter of 2002 were conducted at LCI to mainly focus on improving flux using F-T catalyst/wax slurry collected from a primary separation device.

Rentech collected F-T catalyst/wax slurry with approximately 0.5 wt% solids directly from the primary separation device of the Rentech BCR. The tests at LCI were successful in producing less than ten (10) ppmw iron in BCR wax with higher fluxes than Rentech previously achieved with LCI's system.

Additional testing is required to provide suitable scale-up data for the LCI system. These tests require significantly more F-T catalyst/wax slurry than is available from Rentech's BCR. The Rentech BCR is too small to economically produce the amount of slurry required for LCI to develop EECP scale-up data. Therefore, F-T catalyst/wax slurry collected at the LaPorte AFDU was tested for suitability in providing the required data. The LaPorte F-T catalyst/wax slurry contains a larger proportion of F-T catalyst particle fines than would be expected from a commercial F-T reactor under normal operating conditions. In the test, the LCI filtration system produced a clean filtrate that contained less than ten (10) ppmw of solids at higher fluxes than Rentech previously achieved with LCI's system. In the fourth (4^{th}) calendar quarter of 2002, TESI will provide additional LaPorte AFDU wax for parametric testing at LCI's testing facility.

Task 2.4 Low British Thermal Unit (Btu) Gas Combustion Test

GE developed preliminary confidential and non-confidential task reports for team comments. Based on team comments, GE revised the two (2) reports. The task topical report is expected to be issued in the fourth (4^{th}) calendar quarter of 2002.

Task 2.5 F-T Product Upgrading

Preparation of the F-T wax (outside the scope of the EECP Project) from the products collected at the LaPorte AFDU continued in the third (3rd) calendar quarter of 2002. A safety review of the wax cleanup procedure was completed in August 2002. In September 2002, ChevronTexaco began the task of removing the solids in the F-T wax collected at LaPorte to the less than ten (10) ppmw solids required for F-T Product Upgrading. The F-T wax required for Phase II Product Upgrading will be available early in the fourth (4th) calendar quarter of 2002. The schedule variance caused by this task has delayed the start dates of Lab Batch Fractionation (2.5.2), Wax Hydrocracking (2.5.3), Wax Finishing (2.5.4), Diesel Blending (2.5.6), Wax Fractionation (2.5.8), and Fuel/Engine Performance and Emissions (2.6).

ChevronTexaco ILT completed separation of the F-T naphtha and diesel fractions from the LaPorte AFDU F-T light material in the third (3rd) calendar quarter of 2002. The F-T light material at the LaPorte AFDU was collected in three separate batches. The naphtha, diesel, and soft wax fractions were separated from each of these three batches separately. Each fraction of each of the batch was independently tested for contamination by sulfur, nitrogen, and aromatics for contamination. The analytical tests confirmed the presence of low levels of sulfur, nitrogen, and aromatics in each of the fractions of the three batches. In the third (3rd) calendar quarter of 2002, naphtha and diesel from the three batches were blended at ILT. Naphtha and Diesel Hydrotreating (Task 2.5.7.2/2.7.7.6) is scheduled to start in the fourth (4th) calendar quarter of 2002.

Task 2.6 Fuel/Engine Performance and Emissions

No significant activity occurred during this reporting period. This task is scheduled to start upon producing sufficient quantity of F-T diesel in Task 2.5.

Task 2.7 Petroleum Coke Analysis

The topical report is being developed and should be sent to DOE in the fourth (4th) calendar quarter of 2002.

Task 2.8 Carbon Dioxide (CO_2) Stripping from Methyldiethanolamine (MDEA) at Medium Pressure

The preliminary topical report for Task 2.8 was submitted to DOE for review in July 2002. DOE comments were received and incorporated into the final topical report in August 2002. The final topical report was submitted to DOE for approval in September 2002.

Task 2.9 Integration

The topical report is being developed and should be sent to DOE in the fourth (4^{th}) calendar quarter of 2002.

Task 2.10 Environmental

Oak Ridge National Laboratory has developed a physical adsorbent called the Carbon Fiber Composite Molecular Sieve (CFCMS) that has been shown to be effective in separating (removing) CO_2 from a wide variety of gas streams via the process of physical adsorption. The purpose of this task is to determine if the CFCMS system is capable of removing CO_2 from the exhaust gas of the turbine in the EECP concept. The expected EECP exhaust gas has three (3) times the CO_2 content of natural gas-fired turbine exhaust gas due to the recycles incorporated to increase efficiency. This task will also determine if the application of the CFCMS material with Electrical Swing Adsorption (ESA) process has commercial viability.

The task is split into four separate RD&T subtasks: (i) CFCMS optimization; (ii) CO_2 capacity determination; (iii) design data acquisition, and (iv) the design and construction of a demonstration CO_2 removal device for gas turbine exhaust streams. Subtasks (i) and (ii) have been completed and subtask (iii) is 75% percent completed. The remaining activities of subtask (iii) and (iv) will be completed in the last calendar quarter of 2002.

The following are the results reported for activities ending the third (3^{rd}) calendar quarter of 2002:

1. The highest dynamic capacity for CO_2 was obtained with a feed gas flow rate of 10 liters per minute (l/m).
2. The pressure drop across the CFCMS cell is low. For the four treatments and the flow range of 1 – 20 l/m, the dynamic capacity varied from 0.003 –0.02 psi/inch of cell. At a flow rate of 10 l/m, the dynamic capacity was 0.014.
3. The dynamic capacity of the CFCMS material is high. At feed flow rate of 5 l/m, it is 85% of the equilibrium value and 60% at 11.5 l/m.
4. For sorption from low partial pressure CO_2 feed streams, the dynamic capacity is proportionately higher than at equilibrium.
5. The most acceptable regeneration process is electrical power with vacuum which produces a high concentration of CO_2 in a recoverable stream and requires a relatively low quantity of inert regenerant gas to prepare the cell for the next cycle.

This regeneration process will be optimized and a commercial design will be developed during the fourth (4^{th}) calendar quarter of 2002.

V. List of Major Activities Accomplished in the Third (3rd) Calendar Quarter of 2002

The following list is provided as a quick reference for the work performed during this reporting period:

- Issued Final Quarterly Report No. 11 for DOE approval.
- Completed F-T Pilot Confirmation Test (Task 2.1.3).
- Conducted additional secondary catalyst/Wax filtration test at LCI (Task 2.3.2).
- Prepared F-T Naphtha and F-T Diesel for Hydrotreating at ILT (Task 2.5.7.2/2.7.7.6).
- Issued Final CO_2 Stripping from MDEA Topical Report (Task 2.8) for DOE Approval.
- Began cleaning of LaPorte AFDU wax to less than 10 ppmw iron (outside EECP Project funding).
- Completed confidential report on Low BTU Gas Combustion testing confidential report.

VI. List of Major Activities Planned for the Fourth (4th) Calendar Quarter of 2002

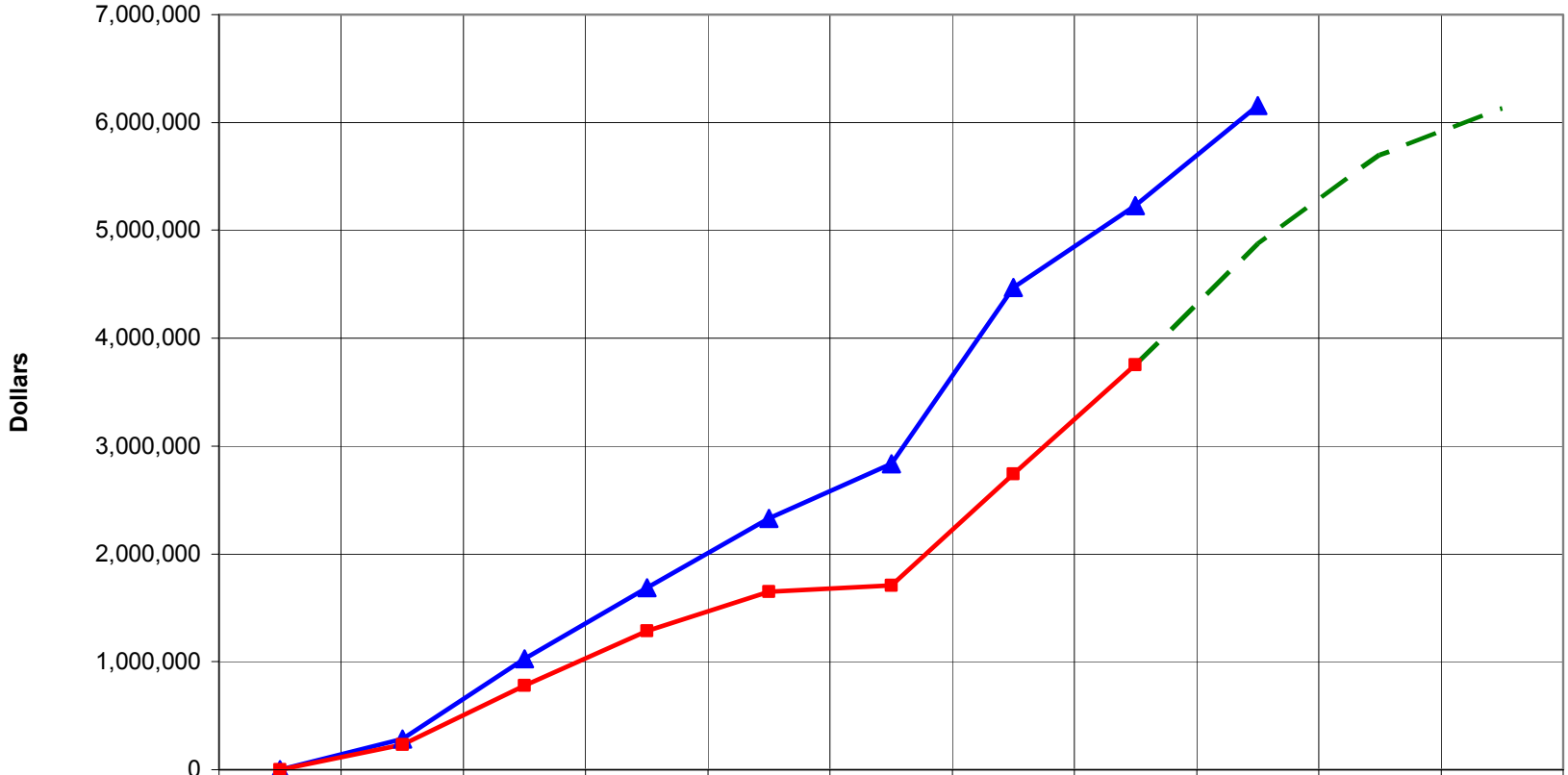
The following list is provided as a quick reference for the work planned for the upcoming quarter:

- Submit Quarterly Report No. 12 for DOE review.
- Complete F-T catalyst regeneration/rejuvenation study at Denver (Task 2.1.1).
- Conduct secondary catalyst/Wax filtration parametric study at LCI (Task 2.3.2).
- Issue Low Btu Gas Combustion Test Report (Task 2.4) for DOE review.
- Deliver F-T wax collected at the LaPorte AFDU (outside EECP Project) to Task 2.5 Licensors.
- Start Lab Batch Fractionation Pilot Plant (Task 2.5.2).
- Start Wax Hydrocracking Pilot Plant (Task 2.5.3).
- Start Wax Finishing Pilot Plant (Task 2.5.4).
- Start Naphtha and Diesel Hydrotreating at ILT (Task 2.5.7.2/2.7.7.6).
- Issue Petroleum Coke Analysis Report (Task 2.7) for DOE Review.
- Issue Integration Report (Task 2.9) for DOE review.
- Start F-T catalyst to gasifier study (Task 2.10.2).
- Analyze F-T catalyst for landfill requirements (Task 2.10.3).

VII. Financial Status

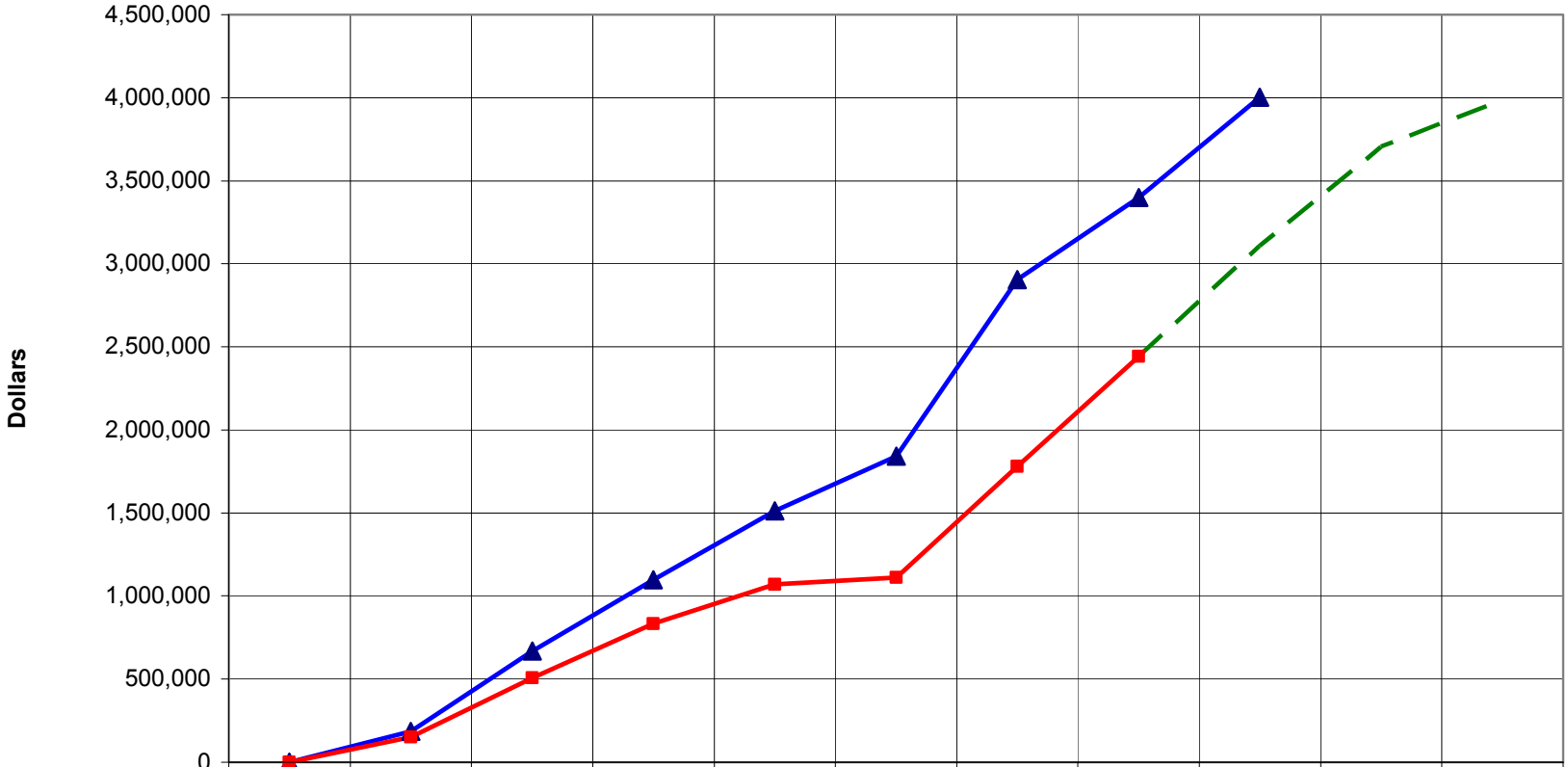
The following three graphs depict the financial status and progress of Phase II activities. The graphs are shown on the following three pages:

Early Entrance Coproduction Plant
Phase II - Total Expenditures



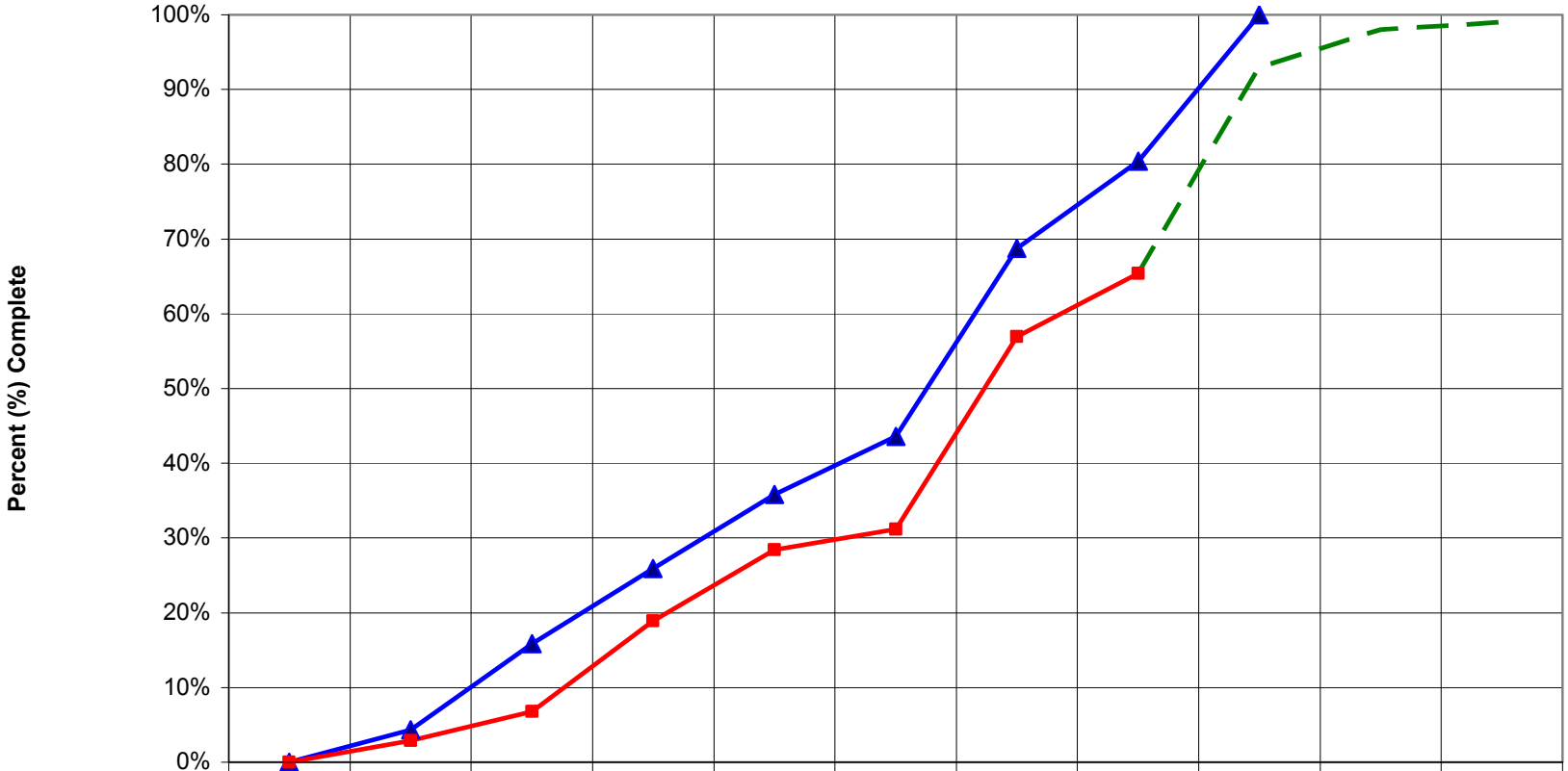
	4Q 00	1Q 01	2Q 01	3Q 01	4Q 01	1Q 02	2Q 02	3Q 02	4Q 02	1Q 03	2Q 03
Planned	0	$284,249	$1,028,829	$1,687,490	$2,328,076	$2,834,333	$4,471,770	$5,231,284	$6,158,738		
Actual	0	$230,942	$779,245	$1,284,125	$1,648,434	$1,707,968	$2,741,111	$3,754,890			
Forecast								$3,754,890	$4,876,875	$5,698,613	$6,129,805

Early Entrance Coproduction Plant
Phase II - DOE Expenditures



	4Q 00	1Q 01	2Q 01	3Q 01	4Q 01	1Q 02	2Q 02	3Q 02	4Q 02	1Q 03	2Q 03
Planned	0	$184,762	$668,739	$1,096,868	$1,513,249	$1,842,316	$2,906,651	$3,400,335	$4,003,180		
Actual	0	$150,112	$506,509	$834,681	$1,071,482	$1,110,179	$1,781,722	$2,440,679			
Forecast								$2,440,679	$3,107,813	$3,704,098	$3,984,373

Early Entrance Coproduction Plant
Phase II - Total Percent Complete

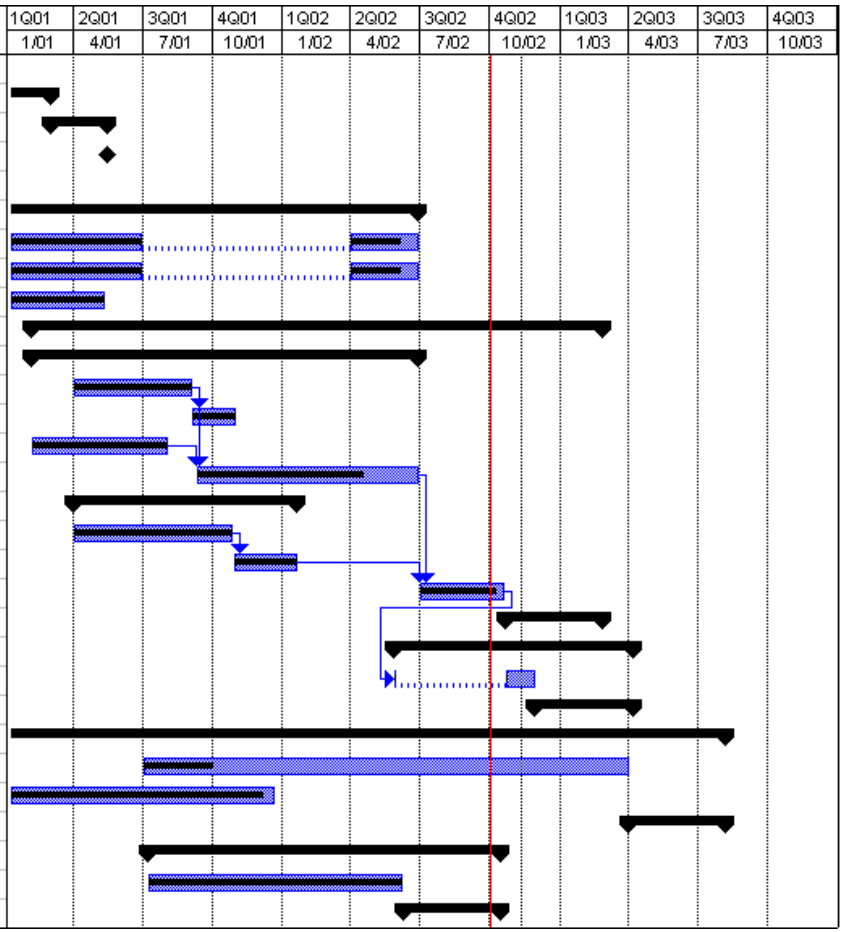


	4Q 00	1Q 01	2Q 01	3Q 01	4Q 01	1Q 02	2Q 02	3Q 02	4Q 02	1Q 03	2Q 03
Planned	0	4%	16%	26%	36%	44%	69%	80%	100%		
Actual	0	3%	7%	19%	28%	31%	57%	65%			
Forecast								65%	93%	98.0%	99%

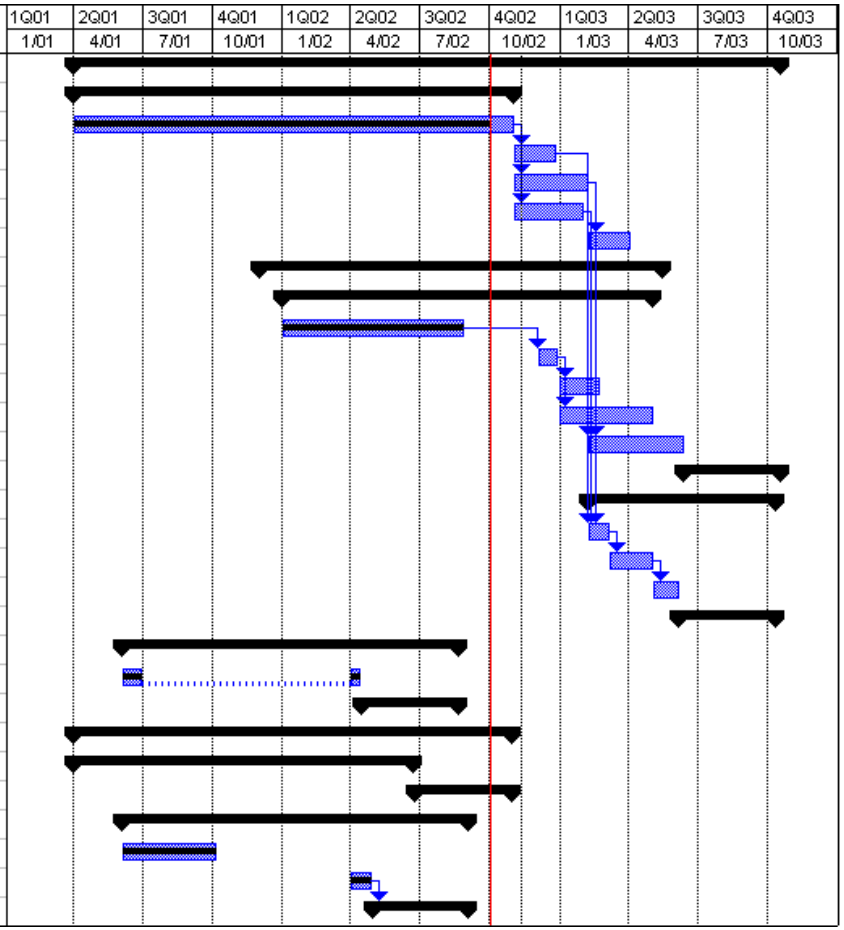
VIII. Schedule

The following schedule depicts the updated Phase II project schedule and shows percent complete by task as of September 30 2002. For a description of the work involved in each task, refer to the Cooperative Agreement and Research, Development, and Testing Plan. This schedule was prepared using Microsoft Project 2000 software.

ID	Task Name	Start	Finish
1	**Task 1 -- Project Management Plan**	Mon 1/8/01	Wed 5/16/01
2	**1.1 Project Management Plan**	**Mon 1/8/01**	**Fri 3/2/01**
6	**1.2 Submit Project Management Plan to DOE**	**Fri 3/2/01**	**Wed 5/16/01**
10	**1.3 Submit Phase II Project Management Plan to DOE**	Wed 5/16/01	Wed 5/16/01
11	**Task 2--Engineering Analysis, Modeling, & Experiment RD&T**	Mon 1/8/01	Thu 1/2/03
12	**2.0 Pre-RD&T**	**Mon 1/8/01**	**Fri 6/28/02**
13	2.0.1 Engineering	Mon 1/8/01	Fri 6/28/02
14	2.0.2 Develop detailed test plans	Mon 1/8/01	Fri 6/28/02
15	2.0.3 Ensure NEPA Requirements	Mon 1/8/01	Fri 5/11/01
16	**2.1 Pilot Plant Confirmation**	**Mon 2/5/01**	**Mon 2/24/03**
17	2.1.1 Catalyst Regeneration/rejuvenation	**Mon 2/5/01**	**Fri 6/28/02**
18	2.1.1.1 Deactivate catalyst for testing	Mon 4/2/01	Mon 9/3/01
19	2.1.1.2 Analysis of deactivated catalyst	Tue 9/4/01	Mon 10/29/01
20	2.1.1.3 Literature search	Mon 2/5/01	Thu 8/2/01
21	2.1.1.4 Laboratory testing	Mon 9/10/01	Fri 6/28/02
22	2.1.2 Catalyst Addition/Withdrawal	Mon 4/2/01	Fri 1/18/02
23	2.1.2.1 Design	Mon 4/2/01	Fri 10/26/01
24	2.1.2.2 Fabrication	Mon 10/29/01	Fri 1/18/02
25	2.1.3 Pilot testing in BCR	Mon 7/1/02	Fri 10/18/02
26	**2.1.4 End of task report**	**Mon 10/21/02**	**Mon 2/24/03**
32	**2.2 Mathematical Model & Reactor Scale-Up Confirmation**	**Mon 5/27/02**	**Mon 4/7/03**
33	2.2.1 Confirm Mathematical Model	Mon 5/27/02	Fri 11/29/02
34	**2.2.2 End of task report**	**Fri 11/29/02**	**Mon 4/7/03**
40	**2.3 Catalyst/Wax Separation**	**Mon 1/8/01**	**Tue 8/5/03**
41	2.3.1 Alternate F-T Catalyst/Wax separation	Mon 7/2/01	Mon 3/31/03
42	2.3.2 Secondary F-T Catalyst/Wax separation	Mon 1/8/01	Fri 12/21/01
43	**2.3.3 End of task report**	**Tue 4/1/03**	**Tue 8/5/03**
49	**2.4 Low BTU Gas Combustion Test**	**Mon 7/9/01**	**Mon 10/14/02**
50	2.4.1 Low BTU Gas Combustion Test	Mon 7/9/01	Fri 6/7/02
51	**2.4.2 End of task report**	**Mon 6/10/02**	**Mon 10/14/02**



ID	Task Name	Start	Finish
57	**2.5 F-T Product Upgrading**	**Mon 4/2/01**	**Fri 10/17/03**
58	2.5.1 Preparation of LaPorte AFDU Product for Upgrading	**Mon 4/2/01**	**Thu 10/31/02**
59	2.5.1.2 Catalyst/Wax Separation to 10ppm	Mon 4/2/01	Thu 10/31/02
60	2.5.2 Lab Batch Fractionation	Fri 11/1/02	Thu 12/26/02
61	2.5.3 Wax Hydrocracking Pilot Plant Run	Fri 11/1/02	Thu 2/6/03
62	2.5.4 Wax Finishing Pilot Plant Run	Fri 11/1/02	Thu 1/30/03
63	2.5.5 Characterization Testing	Fri 2/7/03	Thu 4/3/03
64	2.5.6 Diesel Blending Testing	**Mon 12/3/01**	**Thu 5/15/03**
67	2.5.7 Naphtha Testing	**Tue 1/1/02**	**Fri 5/2/03**
68	2.5.7.1 Naphtha Fractionation	Tue 1/1/02	Mon 8/26/02
69	2.5.7.2 Naphtha Hydrotreating	Mon 12/2/02	Fri 12/27/02
70	2.5.7.3 Ethylene Cracker Yield Confirmation Tests	Mon 12/30/02	Fri 2/21/03
71	2.5.7.4 Fuel Cell Reformer Tests	Mon 12/30/02	Fri 5/2/03
72	2.5.8 UIC Wax Fractionation	Fri 2/7/03	Thu 6/12/03
73	**2.5.9 End of task report**	**Fri 6/13/03**	**Fri 10/17/03**
79	**2.6 Fuel/Engine Performance and Emissions**	**Fri 2/7/03**	**Fri 10/10/03**
80	2.6.1 Lubricity Additive Testing	Fri 2/7/03	Thu 3/6/03
81	2.6.2 Hot-Start Cycle Transient Engine Test	Fri 3/7/03	Thu 5/1/03
82	2.6.3 Solvent Extraction of Organic Fraction from DPM	Fri 5/2/03	Thu 6/5/03
83	**2.6.5 End of task report**	**Fri 6/6/03**	**Fri 10/10/03**
89	**2.7 Petroleum Coke Analysis**	**Mon 6/4/01**	**Mon 8/19/02**
90	2.7.1 Petcoke assay	Mon 6/4/01	Fri 4/12/02
91	**2.7.2 End of task report**	**Mon 4/15/02**	**Mon 8/19/02**
97	**2.8 CO2 stripping from MDEA at medium pressure**	**Mon 4/2/01**	**Mon 10/28/02**
98	**2.8.1 Testing**	**Mon 4/2/01**	**Fri 6/21/02**
103	**2.8.2 End of task report**	**Mon 6/24/02**	**Mon 10/28/02**
109	**2.9 Integration**	**Mon 6/4/01**	**Mon 9/2/02**
110	2.9.1 Slurry w/F-T water	Mon 6/4/01	Fri 10/5/01
111	2.9.1.1 Additonal Slurry Tests w/F-T water	Mon 4/1/02	Fri 4/26/02
112	**2.9.2 End of task report**	**Mon 4/29/02**	**Mon 9/2/02**



ID	Task Name	Start	Finish
118	**2.10 Environmental**	**Mon 7/2/01**	**Mon 6/9/03**
119	2.10.1 Slag & fines characterization	Mon 10/8/01	Fri 6/28/02
120	2.10.2 F-T catalyst to gasifier	Mon 6/3/02	Fri 8/23/02
121	2.10.3 F-T catalyst disposal	Mon 6/3/02	Fri 10/4/02
122	2.10.4 CO2 recovery from gas turbine	Mon 7/2/01	Fri 1/31/03
123	**2.10.5 End of task report**	**Mon 2/3/03**	**Mon 6/9/03**
129	**2.11 End of Task 2 Summary Report**	**Wed 8/6/03**	**Wed 11/19/03**
135	**Task 3--Updating & Implementing Essential RD&T**	Mon 10/8/01	Tue 12/10/02
136	**3.0 Critical & Essential RD&T Plan**	**Mon 10/8/01**	**Mon 2/4/02**
143	**3.1 Critical & Essential RD&T**	Tue 2/5/02	Mon 11/11/02
144	**3.2 Preliminary Report**	**Tue 11/12/02**	**Thu 1/9/03**
151	**3.3 Final Report**	**Fri 1/10/03**	**Tue 2/11/03**
154	**Task 4--Update Concept Basis of Design**	Mon 5/27/02	Wed 1/1/03
155	**4.1 Update the Concept Basis of Design**	**Mon 5/27/02**	**Wed 10/30/02**
161	**4.2 Submit the Concept Basis of Design to DOE**	**Wed 10/30/02**	**Wed 1/1/03**
165	**4.3 Submit the Updated Concept Basis of Design to DOE**	Wed 1/1/03	Wed 1/1/03
166	**Administration**	Mon 1/8/01	Mon 6/30/03