GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION
SPONSORED PROJECT INITIATION

Date: 9-24-79

Project Title: Wood Energy Demonstration Program

Project No: A-2400

Project Director: Mr. J.L. Birchfield

Sponsor: Georgia Office of Energy Resources; Atlanta, Ga. 30334

Agreement Period: From May 1, 1979 Until April 14, 1980

Type Agreement: OER Contract No. 164 (subcontract under DOE No. DE-FG05-79ET23076)

Amount: $793,810

Reports Required: Monthly Progress Reports

Sponsor Contact Person(s):

Technical Matters

Mr. Mark Zwecker
Office of Energy Resources
State of Georgia
270 Washington Street, S.W.
Atlanta, Ga. 30334

Contractual Matters
(thru OCA)

Defense Priority Rating: None

Assigned to: ERL/WEB (School/Laboratory)

COPIES TO:

Project Director
Division Chief (EES)
School/Laboratory Director
Dean/Director—EES
Accounting Office
Procurement Office
Security Coordinator (OCA)
Reports Coordinator (OCA)

Library, Technical Reports Section
EES Information Office
EES Reports & Procedures
Project File (OCA)
Project Code (GTRI)
Other
SPONSORED PROJECT TERMINATION SHEET

Date 6/16/82

Project Title: Wood Energy Demonstration Program

Project No: A-2400

Project Director: Bulpitt

Sponsor: Georgia Office of Energy Resources; Atlanta, GA 30334

Effective Termination Date: 12/31/81

Clearance of Accounting Charges: 12/31/81

Grant/Contract Closeout Actions Remaining:

☑ Final Invoice and Closing Documents
☐ Final Fiscal Report
☐ Final Report of Inventions
☐ Govt. Property Inventory & Related Certificate
☐ Classified Material Certificate
☐ Other

Assigned to: - TAL/WEB - (School/Laboratory)

COPIES TO:

Administrative Coordinator
Research Property Management
Accounting
Procurement/EES Supply Services

Research Security Services
Reports Coordinator (OCA)
Legal Services (OCA)
Library

EES Public Relations (2)
Computer Input
Project File
Other
19 June 1979

Mr. Ed Bistany
Georgia Office of Energy Resources
270 Washington St., S. W.
Atlanta, Georgia 30334

Dear Ed:

Here is my best estimate of what is required for the DOE contract. Hopefully you can write a cover letter and send this on its way. If you need anything else please call me at 894-3589.

Sincerely,

William S. Bulpitt, P. E.
Research Engineer

WSB: dm

Attachments: Technical Status Report
Management Plan
Cost Plan
Milestone Plan & Management Report

An Equal Employment/Education Opportunity Institution
COST PLAN

The following is a cost plan for Grant No: DE-FG05-79ET23076:

### Direct Salaries and Wages

<table>
<thead>
<tr>
<th>Position</th>
<th>Hours</th>
<th>Rate</th>
<th>Total</th>
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<tbody>
<tr>
<td>Senior Research Engineer</td>
<td>8.9</td>
<td>$2695/mo</td>
<td>$23,986</td>
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<tr>
<td>Research Engineers, Assistant Research Engineers</td>
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<td>Research Engineer</td>
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<td>Assistant Research Engineer</td>
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<td>$1711/mo</td>
<td>$28,917</td>
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<td>Student Assistant</td>
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<td>$1076/mo</td>
<td>8,500</td>
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<td>Technicians</td>
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<td>Secretarial</td>
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<td>$929/mo</td>
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**Total Salaries and Wages** $176,613

### Overhead

- Retirement Benefits (9.83% of Direct Salaries) $16,526
- Travel $9,357
- Printing and Reproduction $9,000
- Computer Analysis $1,580
- Construction Cost Estimate $438,471
- Audio Visual Supplies $2,037
Experiment Equipment and Instrumentation

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<th>Cost</th>
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<td>Laboratory Weighing and Calorimetry Equipment</td>
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<td>Laboratory Drying and Testing Equipment</td>
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<tr>
<td>Contract with the University of Georgia</td>
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**TOTAL GRANT** $818,810

The planned costs broken down by tasks are as follows:

<table>
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<tr>
<th>Task</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Task 1 - Feasibility Studies</td>
<td>$127,678</td>
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<td>Task 2 - Demonstration Projects</td>
<td>565,452</td>
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<td>Task 3 - Technology Dissemination</td>
<td>51,436</td>
</tr>
<tr>
<td>Task 4 - Wood Fuels Supply &amp; Processing Methodology</td>
<td>74,244</td>
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**TOTAL** $818,810
PROJECT

Title: A State Demonstration Program in Wood Energy

CONTRACT

Number: DE-FG05-79ET23076
Start Date: 05/01/79
Completion Date: 04/30/80
Contractor: Georgia Office of Energy Resources
270 Washington St., S.W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to determine and demonstrate the feasibility of using wood as an energy source in the non-forest products industry in Georgia.

2.0 CONTRACT TASKS

Task 1.0 Feasibility studies for 18 suppliers or users to determine how a wood fuel market can be developed, what role to play in distribution and use of wood fuel, and how to deal with market constraints.

Task 2.0 Conversion of three industrial plants to wood energy, demonstrating wood combustion techniques to important representative sectors of industry.

Task 3.0 Technology dissemination to inform industry and other interested parties about wood energy systems and the results of this program.

Task 4.0 Develop a wood fuel processing data base to provide users with knowledge of the types of fuel available and the criteria for proper selection.

3.0 SUMMARY STATUS ASSESSMENT AND FORECAST

Contract arrangements are being made with the Georgia Tech Research Institute and the University of Georgia. Work should be started on all tasks during the next reporting period.

ATTACHMENTS:

- Contract Management Plan
- Contract Budget Summary
- Milestone Plan and Management Report

Ed Bistany
Program Coordinator
Georgia Office of Energy Resources
MANAGEMENT PLAN

Grant No:  DE-FG05-79ET23076

Work performed under this grant will be managed by the Georgia Office of Energy Resources. The program will be coordinated by Mr. Ed Bistany.

The work will be performed under two separate contracts with the Georgia Tech Research Institute and with The University of Georgia School of Forestry.

The work at Georgia Tech will be coordinated by Mr. Jerry Birchfield and the specific tasks of the program will be managed by the following Georgia Tech personnel:

- Task 1 - Feasibility Studies
  Manager:  G. B. Curtis
- Task 2 - Demonstration Projects
  Manager:  W. S. Bulpitt
- Task 3 - Technology Dissemination
  Manager:  C. L. Aton
- Task 4 - Fuels Supply and Processing Methodology
  Manager:  T. F. McGowan

The overall management plan for the project is displayed in Figure 1.
1. A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY

2. Contractor Information
   Georgia Office of Energy Resources
   270 Washington St., S.W.
   Atlanta, Georgia 30334

3. Contract Number
   DE-FG05-79ET23076

4. Contract Start Date
   May 1, 1979

5. Contract Completion Date
   April 30, 1980

6. Milestone Plan and Management Report
   FY 79 FY 80 FY 81

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<th>9. Fiscal Years and Months (M, J, J, A, S, O, N, D, J, F, M)</th>
<th>10. Percent Complete</th>
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<td>User Feasibility Studies</td>
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<td>Review of Conversions</td>
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11. Remarks

12. Signature of Contractor's Project Manager and Date

13. Signature of Government Technical Representative and Date
## A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY

**Reporting Period:**
1 May through 31 May

**Contract Number:**
DE-FG05-79ET23076

**Contract Start Date:**

**Contract Completion Date:**

### Progress Chart

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<td>Analysis of Wood Fuels</td>
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<td>▲</td>
<td>100%</td>
</tr>
<tr>
<td>4.2</td>
<td>Comparison of Process Routes</td>
<td>▲</td>
<td>▲</td>
<td>▲</td>
<td>100%</td>
</tr>
<tr>
<td>4.3</td>
<td>Visits to Existing Facilities</td>
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<td>▲</td>
<td>100%</td>
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<tr>
<td>4.4</td>
<td>Seminar presentation</td>
<td>▲</td>
<td>▲</td>
<td>▲</td>
<td>100%</td>
</tr>
</tbody>
</table>

### Remarks

- Remarks

### Signature

12. Signature of Contractor's Project Manager and Date

13. Signature of Government Technical Representative and Date
Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington St., S.W.  
Atlanta, Georgia 30334

Dear Ed:

Enclosed please find two (2) copies of this month's progress report on our project A-2400. I hope you will find them satisfactory. I am still a little unsure of the format and would appreciate having any feedback you may get from DOE.

I hope that your office and our contracts people will be able to execute a final contract soon. If you have any questions please call me at 894-3589.

Sincerely,

William S. Bulpitt  
Research Engineer

CC: J. L. Birchfield  
R. A. Cassanova  
G. B. Curtis  
T. F. McGowan  
C. L. Aton
PROJECT
Title: A State Demonstration Program in Wood Energy

CONTRACT
Number: DE-FG05-79ET23076
Start Date: 05/01/79
Completion Date: 04/30/80
Contractor: Georgia Office of Energy Resources
270 Washington St., S. W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE
The objective of this project is to determine and demonstrate the feasibility of using wood as an energy source in the non-forest products industry in Georgia.

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Task 3.0 Technology dissemination to inform industry and other interested parties about wood energy systems and the results of this program.
Task 4.0 Develop a wood fuel processing data base to provide users with knowledge of the types of fuel available and the criteria for proper selection.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES
None to report during this period.

4.0 VARIANCES
None to report during this period.

5.0 SUMMARY STATUS ASSESSMENT AND FORECAST
Task 1.0 Personnel assignments have been made and organizational plans have been completed. Several trade associations have been contacted and their aid is being sought in identifying plants for the feasibility studies. The organizations contacted include the Georgia Poultry Federation, the Georgia Textile
Manufacturers Association, the Carpet and Rug Institute, the Georgia Forestry Association, and the Georgia Forestry Commission. The executive management of each organization has been briefed on the project and have pledged their cooperation.

Task 2.0 Meetings have been held with members of the Governor's Staff concerning likely candidate sites for the demonstrations, and meetings have been held with several plants that have expressed interest in the past in wood energy conversions. These sites include food processing, poultry processing, and textile manufacture. Selections should be nearly finalized by the end of the next reporting period. Details of cost sharing arrangements are being worked on by the Georgia Tech Office of Contract Administration.

Task 3.0 The first publication to be produced under this task has been started and it will be entitled: Wood Energy: An Overview. This publication will give a brief overview of supply, economics, and technologies associated with wood for energy. A slide/tape presentation will supplement the booklet. Dates and topics for the first two wood energy seminars have been selected and are as follows:

- October 31 - WOOD AS AN INDUSTRIAL FUEL
- January 30 - ECONOMICS OF WOOD FOR ENERGY

Lists have been compiled of the following:

1) Publications interested in receiving news releases on wood.
2) Potential outside speakers and topics
3) Technical society contacts for wood energy publications.

Task 4.0 A literature search has been conducted on solid fuel combustion and processing which will form the basis for a comparative study on various forms of wood energy. Sample of Pullman-Woodex and Tennessee Woodex pellets were analyzed by an independent testing laboratory. These samples will receive proximate, ultimate, moisture content, and ash analyses. The initial organization of manufacturers of processing and handling equipment literature is well underway.

ATTACHMENTS:

- Milestone Plan and Management Report

Ed Bistany
Program Coordinator
Georgia Office of Energy Resources
# Milestone Plan and Management Report

**U.S. Energy Research and Development Administration**

**A State Demonstration Program in Wood Energy**

**Georgia Office of Energy Resources**

### Milestones

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<th>Milestone Number</th>
<th>Milestone Description</th>
<th>Completion Status</th>
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<td>3.3</td>
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<td>3.4</td>
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<td>3.5</td>
<td>Presentation to Govt. Organ.</td>
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<tr>
<td>4.1</td>
<td>Analysis of Wood Fuels</td>
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<td>4.2</td>
<td>Comparison of Process Routes</td>
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<td>Visits to Existing Facilities</td>
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<td>4.4</td>
<td>Seminar Presentation</td>
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### Milestone Period

- **Start Date:** 1 June
- **End Date:** 30 June

### Contract Number

DE-FG05-79ET23076

### Revisions

- **Form ERDA 535**

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**Table of Contents**

- **1**: Contract Identification
- **2**: Milestones
- **3**: Milestone Plan
- **4**: Milestone Management
- **5**: Milestone Report

---

**Remarks**

**Signature of Contractor's Project Manager and Date**

**Signature of Government's Technical Representative and Date**
## Milestone Plan and Management Report

**Program:** A State Demonstration Program in Wood Energy

**Contractor Information:**
- **Name:** Georgia Office of Energy Resources
- **Address:** 270 Washington St., S.W., Atlanta, Georgia 30334

**Milestone Table**

<table>
<thead>
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<th>FY 80</th>
<th>FY 81</th>
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<td>1.2</td>
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<td>User Feasibility Studies</td>
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<td>2.1</td>
<td>Select Demonstration Site</td>
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<td>2.2</td>
<td>Conceptual Designs</td>
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<td>3.2</td>
<td>Audio/Visual Program Dev.</td>
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</table>

**Signature of Contractor Project Manager and Date:**

**Signature of Government Technical Representative and Date:**
Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington Street, S.W.  
Atlanta, Georgia 30334

Dear Ed:

Enclosed please find two (2) copies of this month's progress report on our project A-2400. We will have a draft of our wood energy booklet for your review within the next two weeks.

I will be on vacation from August 27 to September 10. If you have any questions during that time, please call Grant Curtis at 894-3589.

Sincerely,

William S. Bulpitt  
Chief, Wood Energy Systems Branch

WSB/jb

Enclosures

cc: J.L. Birchfield  
R.A. Cassanova  
G.E. Curtis  
T.F. McGowan  
C.L. Aton

An Equal Employment/Education Opportunity Institution
MONTHLY STATUS REPORT

Date: 8/13/79
Period: 7/01/79 - 7/31/79

PROJECT

Title: A State Demonstration Program in Wood Energy

CONTRACT

Number: DE-FG05-79ET23076
Start Date: 05/01/79
Completion Date: 04/30/80
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Atlanta, Georgia 30334

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Task 4.0 Develop a wood fuel processing data base to provide users with knowledge of the types of fuel available and the criteria for proper selection.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

Selection of demonstration sites for Task 2.0 expected to be delayed 1 to 1-1/2 months due to expanded participation of industry organizations.
5.0 SUMMARY STATUS ASSESSMENT AND FORECAST

Task 1.0 The work this month has primarily involved the receipt of fourteen written requests from various industries to be considered as candidate plants for wood energy feasibility studies. The response from members of the Textile Manufacturers Association has been especially good.

Work continues on the accumulation of system and component information on various wood energy systems.

It is expected that the first industry survey visits will be made in August.

The work for Task 1 - Feasibility Studies - is on schedule in accordance with the contract plan.

Task 2.0 Further work was carried out during this reporting period on the details of cost sharing arrangements between Georgia Tech and industry. It has been decided to delay the final decision on which plants will be chosen to participate until further input and suggestions from industrial organizations (including Georgia Textile Manufacturers Association, Carpet & Rug Institute, and Georgia Poultry Federation) are received. This is expected to delay the final choices until late September.

Task 3.0 Final preparation is being made for publication of the booklet entitled Wood Energy: An Overview. This booklet will be published during the next reporting period. News releases on the wood energy activities in Georgia have been sent to 150 industrial and technical publications. Arrangements have been made for the Georgia Tech Office of Continuing Education to handle the logistics for the seminar to be held October 31.

Task 4.0 A report was written on properties of wood and wood fuels. Topics covered include:

- Properties of wood fuel
- Moisture content and heating value
- Ash and other residue
- Properties of low Btu gas
- General comments on design considerations
- Wood chips
- Wood pellets
- References

The report is being edited and will be in final form in early August. A trip agenda has been arranged for September which includes participation in an ASTM Committee Meeting on wood
fuel (September 11-13) in Nevada. The facilities of California Pellet Mill in Nevada and California will be visited, as well as pelletizing operations in Oregon or Vancouver, B.C.

An outside laboratory, MacMillian Research, is performing an ultimate, proximate and high heat value analysis on 2 wood pellet samples. Results will be completed early next month.

ATTACHMENTS:

- Milestone Plan and Management Report

Ed Bistany
Program Coordinator
Georgia Office of Energy Resources
<table>
<thead>
<tr>
<th>Task</th>
<th>FY 79</th>
<th>FY 80</th>
<th>FY 81</th>
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11 Remarks

12 Signature of Contractor's Project Manager and Date

13 Signature of Governmental Technical Representative and Date
# Milestone Plan and Management Report

**A State Demonstration Program in Wood Energy**

**Georgia Office of Energy Resources**
270 Washington St., S.W.
Atlanta, Georgia 30334

### Milestones

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### Milestone Details

- **1.1 Supplier/User Meetings**
- **1.2 Identification of Supplier/User**
- **1.3 Feasibility Studies**
- **1.4 User Feasibility Studies**
- **2.1 Select Demonstration Site**
- **2.2 Conceptual Designs**
- **2.3 Contract Document Prep. Assist in Contractor Selection**
- **2.6 Monitor Performance**
- **2.7 Analysis and Reporting**
- **2.8 Disseminate Results**
- **3.1 Wood Energy Seminars**
- **3.2 Audio/Visual Program Dev.**

### Timeline

- **FY 79**
- **FY 80**
- **FY 81**

### Contact Information

**Georgia Office of Energy Resources**
270 Washington St., S.W.
Atlanta, Georgia 30334
11 September 1979

Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington Street, S. W.  
Atlanta, Georgia 30334

Dear Ed:

Enclosed please find two (2) copies of this month's progress report on our project A-2400. If you have any questions please call me at 894-3475 or Bill Bulpitt at 894-3589.

Sincerely,

Jerry L. Birchfield  
Program Manager

JLB:dm

Enclosures

cc: R. A. Cassanova  
    G. B. Curtis  
    W. S. Bulpitt  
    T. F. McGowan  
    C. L. Aton
PROJECT

Title: A State Demonstration Program in Wood Energy

CONTACT

Number: DE-FG05-79ET23076
Start Date: 05/01/79
Completion Date: 04/30/80
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to determine and demonstrate the feasibility of using wood as an energy source in the non-forest products industry in Georgia.

2.0 CONTRACT TASKS

Task 1.0 Feasibility studies for 18 suppliers or users to determine how a wood fuel market can be developed, what role to play in distribution and use of wood fuel, and how to deal with market constraints.

Task 2.0 Conversion of three industrial plants to wood energy, demonstrating wood combustion techniques to important representative sectors of industry.

Task 3.0 Technology dissemination to inform industry and other interested parties about wood energy systems and the results of this program.

Task 4.0 Develop a wood fuel processing data base to provide users with knowledge of the types of fuel available and the criteria for proper selection.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

No further variances to report during this period.

5.0 SUMMARY STATUS ASSESSMENT AND FORECAST

Task 1.0 The principal work this month has been the site visits to three industrial plants to gather data for the preparation of wood feasibility studies. Each of the plants visited to date have boilers that have the capability of burning solid fuels but are presently burning oil and natural gas.
Requests to be considered for feasibility studies are continuing to be received and we now have over 30 such requests.

It is expected that six to eight additional plants will be visited in September.

Task 2.0 The decision process on the candidates for wood energy conversions is being continued and should be completed during the next reporting period. Several plant trips have been made to prospective sites and more trips are planned for September.

Task 3.0 The information booklet Wood Energy: An Overview has been received by all the project task managers and by Office of Energy Resources personnel and has been sent to the printers. It is anticipated that approximately 2000 will be distributed. The topics and speakers for the October 31 seminar have been finalized and preparations are being finalized for a mailout of 1000 announcements throughout the state. Work has also begun on the first slide/tape presentation.

Task 4.0 Wood pellets and wood chip samples have been analyzed in our lab for heating value and moisture content. In addition, the results from the analysis of Tennessee and Pullman - Woodex pellets have been received from MacMillan Research. These pellets were analyzed for proximate, ultimate and higher heating values.

There are not current standards by ASTM (American Society of Testing and Materials) for wood fuel analysis. The ultimate and proximate analysis were performed using the ASTM method for Coal and Coke, D-271-1958. Georgia Tech personnel will be attending an ASTM meeting on wood fuel standards 11 through 13th. The purpose of this meeting is to develop standards for wood fuel analysis and grades and types of fuel, and to resolve the discrepancies which occur with present test methods.

The material for the October 31 Seminar on wood fuel processing is being assembled. The topics to be covered follow:
Properties of Wood Fuels - T.F. McGowan
Processing Methods and Equipment - R. Chelf
Wood Availability in Georgia and the Southeast - C.L. Aton
Wood Storage and Handling - W. S. Bulpitt
Matching the Fuel to the Equipment - T.F. McGowan
Combustion of Wood Fuel - M. Brown

Details on the scope of the discussions under each of these topics will be finalized in September.

ATTACHMENTS:

*Milestone Plan and Management Report

Ed Bistany
Program Coordinator
Georgia Office of Energy Resources
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**Time Frame:**
- **FY 79:** M J J A S O N D J F M A M J J A S O N D J F M
- **FY 80:** M J J A S O N D J F M A M J J A S O N D J F
- **FY 81:** M J J A S O N D J F
# Milestone Plan and Management Report

**Georgia Office of Energy Resources**

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10 October 1979

Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington Street, S. W.  
Atlanta, Georgia  30334

Dear Ed:

Enclosed please find two (2) copies of this month's progress report on our project A-2400. If you have any questions please call me at 894-3475 or Bill Bulpitt at 894-3448.

Sincerely,

Jerry L. Birchfield  
Program Manager

JLB:dm

Enclosures

cc:  R. A. Cassanova  
    G. B. Curtis  
    W. S. Bulpitt  
    T. F. McGowan  
    C. L. Aton
MONTHLY STATUS REPORT

Date: 10/10/79
Period: 09/01/79 - 09/30/79

PROJECT

Title: A State Demonstration Program in Wood Energy

CONTRACT

Number: DE-FG05-79ET23076
Start Date: 05/01/79
Completion Date: 04/30/80
Contractor: Georgia Office of Energy Resources
270 Washington Street, S. W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to determine and demonstrate the feasibility of using wood as an energy source in the non-forest products industry in Georgia.

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Task 4.0 Develop a wood fuel processing data base to provide users with knowledge of the types of fuel available and the criteria for proper selection.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

Final selection of demonstration sites moved to late October due to expanded industry participation and necessary time for industrial plant decision making.

5.0 SUMMARY STATUS ASSESSMENT AND FORECAST

Task 1.0 Further requests for feasibility studies have been received and 14 initial plant survey visits have been made through this reporting period. There has been increased participation at the Georgia Poultry Federation and the Carpet and Rug Institute this month. Further work has been carried out on
the methodology to be used for the in-plant studies and it is anticipated that in depth in-plant data taking will begin during the next reporting period.

Task 2.0 Twelve candidate sites have been visited for consideration as demonstration sites through this reporting period. Visits to these sites was based on initial interest in the project, willingness to participate financially, and willingness to publish project results. The final decision on which plants will be chosen is now being made and it is anticipated that the sites will include a poultry processing plant, a textile plant, and a food processing plant. Contractual matters are now being worked out so that funding for construction can be passed on from the State of Georgia to the participating plants.

Task 3.0 Wood Energy: An Overview is being published and will be available to participants at the October 31 Seminar. Slide presentations are being prepared for this seminar covering six different subjects relating to wood energy.

Task 4.0 Tech engineers visited Papakube Corp., California Pellet Mill, Transarctic Air, Bio-Solar R & D, and the Eugene Water and Electric Board this month. These companies produce wood pellets or pelletization equipment. In addition, 3 engineers attended an ASTM (American Society of Testing and Materials) meeting on Wood Fuel Standards. We will be contributing to wood fuel test standards and commodity standards for a variety of wood fuels. The visits to plant sites and attendance at the ASTM meeting has added significantly to our knowledge of wood fuel processing.

We attended a seminar at N. C. State University in Raleigh, given by Ken Sterret and Rick Leaver of Sprout-Waldron Co., makers of pelletizing equipment, and a representation of Aeroglide, makers of drying equipment.

The subject matter for the October 31st seminar is being formalized; the subjects to be covered in three of the presentations are now established.

ATTACHMENTS:

- Milestone Plant and Management Report

Ed Bistany
Program Coordinator
Georgia Office of Energy Resources
### Milestone Plan and Management Report

#### State Demonstration Program in Wood Energy

**Georgia Office of Energy Resources**
270 Washington St., S.W.
Atlanta, Georgia 30334

#### MILESTONE PLAN AND MANAGEMENT REPORT

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#### Appendices

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**Georgia Office of Energy Resources**

**U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION**

**MILESTONE PLAN AND MANAGEMENT REPORT**

**5. START DEMONSTRATION PROGRAM IN WOOD ENERGY**

**Staff:**

**Contractor Information:**

DE-FG55-79LT23076

**Contractor Time Period:**

Sept. 1 through Sept. 30

**Contractor Name:**

**Contractor Address:**

**Signature of Authorized:**

1. Project Manager and Date
2. Signature of Government Technical Representative and Date
Mr. Ed Bistany
Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

Dear Ed:

Enclosed please find two (2) copies of this month's progress report on our project A-2400. If you have any questions, please call me at 894-3475 or Bill Bulpitt at 894-3635.

Sincerely,

Jerry L. Birchfield
Program Manager

JLB/jb

Enclosures

cc: R.A. Cassanova
    G.B. Curtis
    W.S. Bulpitt
    T.F. McGowan
    C.L. Aton
MONTHLY STATUS REPORT

Date: 11/10/79
Period: 10/01/79 - 10/30/79

PROJECT

Title: A State Demonstration Program in Wood Energy

CONTRACT

Number: DE-FG05-79ET23076
Start Date: 05/01-79
Completion Date: 04/30/80
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

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Task 4.0 Develop a wood fuel processing data base to provide users with knowledge of the types of fuel available and the criteria for proper selection.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

Final selection of demonstration sites moved to mid November due to expanded industry interest and delays in sub-contract preparation and screening process for industrial applicants.
5.0 SUMMARY STATUS ASSESSMENT AND FORECAST

Task 1.0 Initial plant visits have now been made to the number of plants necessary to meet the contract requirements. It is expected at this time that the work schedule will permit studies for additional plants. Final arrangements are being made for wood supplier studies with the Georgia Forestry Commission and the University of Georgia. Background work is progressing on the material that will be necessary as references for the feasibility studies. Emphasis is now being placed on fuel handling equipment and emissions control.

Task 2.0 Interested sites for demonstration projects have been narrowed down to six including the following plants:

1) Wrigley's - This plant in Gainesville, Georgia manufactures chewing gum and has a minimum requirement for 400 hp of steam supply, currently provided by gas/oil package boilers.

2) Goldkist - This poultry rendering plant in Ball Ground, Georgia processes offal from several other plants in the state. Future plant expansion will require an additional 700 hp of steam production. Goldkist is a cooperatively owned food processing firm.

3) Chipman Union - This textile mill in Union Point, Georgia manufactures mens' hosiery and is currently planning a plant expansion which would require an additional 400 hp of steam capacity. Waste products from the textile operation also need to be disposed of, so fluidized beds and other multi-fuel applications are being considered.

4) Puritan Mills - This textile and plastics operation in Eatonton, Georgia uses steam for textile processing, plastics processing, ovens, press operation, and absorption air conditioning. Process waste disposal is also a problem, so a multifuel combustor could also be considered here. Puritan has also looked into pelletization, so the processing of waste wood for pellets could also be considered.

5) Galaxy Carpet - This textile mill in Chatsworth, Georgia uses steam for a heat setting operation and, are interested in installing a wood boiler with about 200 hp capacity.
6) **Integrated Products** – This textile plant in Aragon, Georgia uses 350 hp of steam to heat set yarn. They currently have gas/oil and an old coal boiler and have been seriously considering a wood conversion.

Each of the applications above have now been contacted to respond with serious intentions in actually carrying through the wood energy project. They have been notified that a firm financial commitment must now be made and that it will be necessary to allow visitors at the plant to observe the wood system in operation. In addition, they have been notified that in-plant personnel will be required to help with tours, technology transfer, and the collection of operational data. Sample sub-contracts have been prepared by the Georgia Tech contract office and mailed to the "finalists". Based on the response of each candidate, the final selection of the 3 or 4 candidates will be made on November 15.

**Task 3.0**

The title of the overview on wood energy has been changed to *Wood: An Alternate Energy Resource*. Production complications have delayed its printing. Completion of 2,000 copies is expected in November.

The "Wood as an Industrial Fuel" seminar was conducted on October 31. Response was excellent. Registrants, totaling 76, were from government agencies, industrial plants, consulting firms, utilities, and hardware manufacturing concerns. A proceedings of the seminar was prepared and distributed.

A list of attendees of the seminar is attached along with copies of the proceedings.

Work on the next seminar, scheduled for January, has begun.

**Task 4.0**

This month was spent preparing a report and slide presentation for the October 31st seminar on "Wood as an Industrial Fuel". The general subject was wood fuel, its types, physical properties, and the equipment associated with its use. The topics covered wood from its raw fuel state through handling, processing, combustion, and heat exchange until it reaches the chimney. Particular emphasis was placed on processing and pelletizing of wood including energy use and the economics of pelletizing plants.

**ATTACHMENTS:**

- Milestone Plant and Management Report
- Attendance Roster (2)
- Seminar Brochure (2)
- Seminar Proceedings (2)

Ed Bistany  
Program Coordinator  
Georgia Office of Energy Resources
## Milestone Plan and Management Report

### Program: A State Demonstration Program in Wood Energy

#### Georgia Office of Energy Resources
270 Washington St., S.W.
Atlanta, Georgia 30334

#### Milestone Chart

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# MILESTONE PLAN AND MANAGEMENT REPORT

**Contract Identification**
A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY
Georgia Office of Energy Resources

**Contract Number**
DE-FG05-79ET23076

**Reporting Period**
October 1 through October 31

### Project Progress

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<td>4.4 Seminar presentation</td>
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</table>
Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington Street, S.W.  
Atlanta, GA 30334

Dear Ed:

Enclosed please find two (2) copies of this month’s progress report on our project A-2400. An extra copy of "Wood, An Alternate Energy Resource," is included for you to keep, and as soon as we get the entire shipment in, Carol Aton will be giving you more copies.

As noted in the progress report, there are two areas of concern at this time on the project. First of all, the delays caused by the dealings with the University of Georgia may hurt the overall performance of the supplier and environmental phases. Secondly, the delays experienced in executing the subcontracts for the demonstrations have hurt the performance of Task 2.0. Since definite commitments have not been obtained from specific industrial plants, it has been impossible to complete the final conceptual designs. Hopefully, this will all be taken care of by the next reporting period, but I want to alert you to the fact that a no-cost extension may be necessary to complete Task 2.0.

If you have any questions, please call me at 894-3635.

Sincerely,

William S. Bulpitt
Program Manager

WSB/jb

Enclosures

cc: J.L. Birchfield  
G.B. Curtis  
T.F. McGowan  
C.L. Aton
MONTHLY STATUS REPORT

Date: 12/11/79
Period: 11/01/79-11/30/79

PROJECT

Title: A State Demonstration Program in Wood Energy

CONTRACT

Number: DE-FG05-79ET23076
Start Date: 05/01/79
Completion Date: 04/30/80
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to determine and demonstrate the feasibility of using wood as an energy source in the non-forest products industry in Georgia.

2.0 CONTRACT TASKS

Task 1.0 Feasibility studies for 18 suppliers or users to determine how a wood fuel market can be developed, what role to play in distribution and use of wood fuel, and how to deal with market constraints.

Task 2.0 Conversion of three industrial plants to wood energy, demonstrating wood combustion techniques to important representative sectors of industry.

Task 3.0 Technology dissemination to inform industry and other interested parties about wood energy systems and the results of this program.

Task 4.0 Develop a wood fuel processing data base to provide users with knowledge of the types of fuel available and the criteria for proper selection.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

The process of working out subcontract details with the University of Georgia on environmental impacts and wood resource studies has delayed some of the performance of Task 1.0.
In addition, further delays have resulted in the final execution of subcontracts for the demonstration projects. Sample subcontracts and detailed requirements were not finalized until late November, with a response date requested of December 17. It may be necessary for Georgia Tech personnel to conduct further meetings with managers of specific plants before a final agreement is arranged. Samples of the necessary subcontracts are included. As a result of these legal necessities, the final selection process has been delayed significantly and it is expected that the other subtasks under Task 2.0 will also be affected. It may be necessary for Georgia Tech to request a no-cost extension on the overall contract to accomplish all the requirements of Task 2.0.

5.0 SUMMARY STATUS ASSESSMENT AND FORECAST

Task 1.0 Work activity for the month continued and was centered on three activities:

1. The background paper on wood fuel handling systems is complete except final editing.
2. The background paper on particulate emission and control has been completed.
3. Preparation of feasibility studies for five plants was begun.

Task 2.0 As mentioned under Section 4.0, further delays have been experienced in the selection process. Formal statements of work and sample subcontracts have been mailed out to the six finalists, and all are still interested in being considered. Tentatively the final selection process should take place approximately January 1.

W.S. Bulpitt presented a paper on "Wood Waste as an Industrial Fuel" to the 1979 Winter Annual Meeting of the ASME. A copy of the paper is attached.

Task 3.0 Wood: An Alternate Energy Resource has been printed. It will be ready for distribution by December 15. Copies of this publication are enclosed.

Work has begun on the January 31 seminar entitled "Safe and Clean Wood Energy." (The economics seminar has been postponed until case studies are completed). Topics to be covered are as follows:

- Environmental Effects of Handling
- Safe Wood Storage
- Health and Safety Requirements for Wood Handling Systems
- Safety Aspects of Combustion Equipment
- Pollution Control Equipment
- Ash Disposal Methods
- Emissions Regulations
A presentation on wood energy was made at the ASME Winter Annual Meeting in New York City. Energy wood supply was discussed relative to timber for products, and various methods of harvesting were covered along with harvest equipment.

Task 4.0 Work has progressed on quantifying the cost of pelletizing equipment used for making wood pellets. This study includes capital cost and rate of production, yielding capital costs in dollars per ton per hour of pellets.

A relatively wide range of cost in pellet mills for a given size has been discovered. The major manufacturer of feed-type pelletizers appear higher in cost than their smaller competition. Firm quotes on several large mills on which cost has only been estimated are being awaited.

Other areas to be covered in this study include die wear and other problems association with the pelletization step of wood fuel processing. The study will include start up operation, motor load control, and die changeover.

---

Ed Bistany
Program Coordinator
Georgia Office of Energy Resources

Attachments:

- Sample Demonstration Requirements and Subcontract
- Milestone Plan and Management Report
- "Wood Waste as an Industrial Fuel"
- "Wood, An Alternate Energy Resource"
- "Pellet Mill Cost and Capacity"
# A State Demonstration Program in Wood Energy

## Milestone Plan and Management Report

### Contract Information
- **Contractor Name:** Georgia Office of Energy Resources
- **Address:** 270 Washington St., S.W., Atlanta, Georgia 30334

### Contract Period
- **Start Date:** November 1, 1979
- **End Date:** November 30, 1980
- **Contract Number:** DE-FG35-79ET23076
- **Contract Start Date:** May 1, 1979
- **Contract Completion Date:** April 30, 1980

### Milestone Chart

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</table>

### Additional Information
- **Supervisor/User Meetings**: Identification of Supplier/Users, Supplier Selection
- **Feasibility Studies**: User Feasibility Studies
- **Select Demonstration Site**: Conceptual Designs
- **Contract Document Prep. Assist in Contractor Selection**: Review of Conversions
- **Monitor Performance**: Analysis and Reporting
- **Disseminate Results**: Wood Energy Seminars
- **Audio/Visual Program Dev.**

### Remarks

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**Note:** This chart outlines the milestones and management report for the A State Demonstration Program in Wood Energy, detailing the progress and completion of various tasks over the fiscal years FY 79, FY 80, and FY 81. The chart includes sections for Supplier/User Meetings, Feasibility Studies, Select Demonstration Site, and other related activities. Each task is marked with a checkmark to indicate completion.
**A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY**

Georgia Office of Energy Resources

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<thead>
<tr>
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<td>Analysis of Wood Fuels Comparison</td>
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<td>Existing Facilities</td>
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<td>Seminar Presentation</td>
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</table>

**Notes**

- Printed Information Development
- Presentation to Industry, Organizations
- Analysis of Wood Fuels Comparison
- Visits to Existing Facilities

**Contract Number**

DE-FG03-79ET23076

**Contracting Party**

Georgia Office of Energy Resources

**Contracting Organization**

U.S. Energy Research and Development Administration

**MILESTONE PLAN AND MANAGEMENT REPORT**
Mr. Ed Bistany
Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, GA 30334

Dear Ed:

Enclosed please find two (2) copies of this month's progress report on our project A-2400. As you know, we are reaching a final decision on the demonstration project sites and expect to be signing the final agreements very shortly.

The subcontract with the University of Georgia has been executed (thanks to your help) and the personnel over there have begun work.

If you have any questions, please call me at 894-3635.

Sincerely,

William S. Bulpitt
Chief, Wood Energy Systems Branch

WSB/jb

Enclosures

cc: J.L. Birchfield
    G.B. Curtis
    T.F. McGowan
    C.L. Aton
MONTHLY STATUS REPORT

Date: 1/14/80
Period: 12/01/79 - 1/01/80

PROJECT

Title: A State Demonstration Program in Wood Energy

CONTRACT

Number: DE-FG05-79ET23076
Start Date: 05/01/79
Completion Date: 04/30/80
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to determine and demonstrate the feasibility of using wood as an energy source in the non-forest products industry in Georgia.

2.0 CONTRACT TASKS

Task 1.0 Feasibility studies for 18 suppliers or users to determine how a wood fuel market can be developed, what role to play in distribution and use of wood fuel, and how to deal with market constraints.
Task 2.0 Conversion of three industrial plants to wood energy, demonstrating wood combustion techniques to important representative sectors of industry.
Task 3.0 Technology dissemination to inform industry and other interested parties about wood energy systems and the results of this program.
Task 4.0 Develop a wood fuel processing data base to provide users with knowledge of the types of fuel available and the criteria for proper selection.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

Responses have been received for consideration for demonstration sites and are still being evaluated at this time.
5.0 SUMMARY STATUS ASSESSMENT AND FORECAST

Task 1.0 Work activity for this month was centered on the following activities:

1. The contract with the University of Georgia for environmental and wood resource studies was executed and it is expected that work will begin in January.
2. Work continues on the preparation of specific feasibility studies, and further data gathering trips have been made to industrial plants.

Task 2.0 Responses have been received from the six finalists being considered for the wood demonstration sites with the following activities:

1. Wrigley's - Wrigley's asked to withdraw from further consideration at this time.
2. Wellington-Puritan Mills - This company advised us that a decision would have to be delayed 30 to 90 days for the approval of a new budget (this may result in disqualification).
3. Gold Kist - Gold Kist advised us of a 30-day delay due to approval of new budgets (this may result in disqualification).
4. Galaxy Carpet - Accepted most terms of contract and are being considered as a finalist for a wood boiler conversion.
5. Chipman-Union - Accepted most terms of contract and are still under serious consideration.
6. Integrated Products - Accepted all terms of contract and are one of the finalists.

Task 3.0 Copies of Wood: An Alternate Energy Resource have been sent to field offices and OER for distribution. One copy will be sent to each of the 51 state energy offices. A news release announcing its availability will be sent to 100 trade publications so that the books can be mailed to interested parties upon request.

Work on the January 31 seminar on "Safe and Clean Wood Energy" is proceeding smoothly. News releases and announcement brochures were sent out January 4. A tentative schedule showing speakers and topics is attached. A proceedings will be printed and handed out to those attending.

A rough draft of a slide/tape presentation giving an introduction to wood energy in non-forest product industries is being assembled.
Task 4.0 Georgia Tech personnel attended a meeting on "Woodex Expansion in the Southeast" in Tallahassee, Florida, on December 10th. This day of the two-day meeting was a combination seminar and news conference to promote the "Woodex" pelletization system. The second day was billed as a semi-annual Bio-Solar/Woodex meeting, and was closed to the public.

We learned at the meeting that Bio-Solar has sold a license to produce "Woodex" wood fuel pellets to Mr. Carlos Reynolds (of Reynolds & Thomas) for Florida, Louisiana, and South Georgia, Alabama, and Mississippi. They have one plant in operation, a used agricultural mill in Clio, Alabama.

The entry of "Woodex" into the Georgia and Southeastern markets is a significant event as the closest wood pellet plants were in North Carolina and Tennessee. A trip is planned to the Clio, Alabama plant in January to monitor their operation and equipment.

We had a meeting with a representative from Landers Pellet Mills, Robert Gaskill, who discussed his line of equipment and operating data on agricultural products and waste materials. He was very informative on equipment maintenance and power consumption and has offered to have us tour a new pelletization facility for Coastal Bermuda Grass in Georgia. Landers will be supplying pellet mills for the Woodex operation slated for Liberty County, Georgia.

Other work this month included orientation of a new engineer who will begin work on this project in January.

Ed Bistany  
Program Coordinator  
Georgia Office of Energy Resources

Attachments:

- Milestone Plan and Management Report  
- Schedule: "Safe and Clean Wood Energy"  
- Press Release  
- Seminar Brochure
<table>
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<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker(s)</th>
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</table>
| 8:30 a.m. | INTRODUCTION             | Carol Aton, Research Engineer II  
Georgia Tech EES            |
| 8:45 a.m. | ENVIRONMENTAL EFFECTS OF HARVESTING ENERGY WOOD       | Joe Saucier, Project Leader  
U.S. Forest Service                |
| 9:15 a.m. | SAFE WOOD STORAGE         | Bryan Miller, Operations Improvement Manager  
Champion Papers                |
| 9:45 a.m. | HEALTH and SAFETY REQUIREMENTS FOR WOOD HANDLING SYSTEMS | Steve Kramer, Research Engineer II  
Georgia Tech EES                |
| 10:15 a.m. | HAZARDS WITH INDUSTRIAL WOOD COMBUSTION | Grant Curtis, Senior Research Engineer  
Georgia Tech EES                |
| 10:45 a.m. | BREAK                   |                                                |
| 11:00 a.m. | POLLUTION CONTROL EQUIPMENT | Mike Brown, Research Engineer  
Georgia Tech EES                |
| 11:30 a.m. | ASH DISPOSAL METHODS     | J. Lewis Tinley, Industrial Waste Management  
Georgia Department of Natural Resources |
| 12:00 p.m. | DISCUSSION ON EMISSIONS REGULATIONS | John Mitchell, Program Manager  
Georgia Department of Natural Resources |
| 12:30 p.m. | ADJOURNMENT              |                                                |
SAFETY AND THE ENVIRONMENT  December 21, 1979
TOPICS OF WOOD WORKSHOP  For Immediate Release

ATLANTA, GA....Clean and safe wood energy for industry is the topic of a workshop to be held here Thursday, Jan. 31, from 8:30 a.m. to noon at the Space Science and Technology Building on the Georgia Tech campus.

The workshop is designed primarily for plant management and engineering personnel who are responsible for making evaluations for converting to solid fuels. It is sponsored by the Department of Energy and the Georgia Office of Energy Resources and is being conducted by Georgia Tech's Engineering Experiment Station (EES).

Carol Aton of EES says that the workshop is part of a project to educate industry on the use of wood as a fuel for plant operations. She adds that the workshop could also be of interest to wood suppliers.

Topics to be covered include: environmental effects of harvesting; safety aspects of combustion equipment; production control equipment; ash disposal methods; and emissions regulations.

Registration for the workshop is at 8:00 a.m. There is a $10 registration fee. For further information contact Joanne Bocek, Georgia Tech Engineering Experiment Station, Atlanta, Ga. 30332, phone (404) 894-3635.
<table>
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## A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY

Georgia Office of Energy Resources

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### Notes
- **FY 79**: Full Year
- **FY 80**: Full Year
- **FY 81**: Full Year

**Milestone Plan:**
- **Phase 1**: Development
- **Phase 2**: Demonstration
- **Phase 3**: Implementation

**Contract Information:**
- Contract Number: DE-FC05-81ET23076
- Start Date: December 1
- End Date: December 30
- **Contract Title**: Milestone Plan and Management Report
- **Contract Description**: A State Demonstration Program in Wood Energy

**Contractor:**
- **Name**: Georgia Office of Energy Resources
- **Location**: [Provide location details]

**Related Projects:**
- [Provide related project details]

**Signatures:**
- **Contractor Signature**: [Signature]
- **Government Technical Representative Signature**: [Signature]
Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington Street, S.W.  
Atlanta, Georgia 30334

Dear Ed:

Enclosed please find two (2) copies of this month's progress report on our project A-2400. As you know, we have reached a final decision on the demonstration project sites and the remaining subtasks have been started.

If you have any questions, please call me at 894-3635.

Sincerely,

William S. Bulpitt  
Chief, Wood Energy Systems Branch

WSB/jb

Enclosures

cc: J.L. Birchfield  
G.B. Curtis  
T.F. McGowan  
C.L. Aton
MONTHLY STATUS REPORT

Date: 2/14/80
Period: 1/01/80 - 1/31/80

PROJECT

Title: A State Demonstration Program in Wood Energy

CONTRACT

Number: DE-FG05-79ET23076
Start Date: 05/01/79
Completion Date: 04/30/80
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to determine and demonstrate the feasibility of using wood as an energy source in the non-forest products industry in Georgia.

2.0 CONTRACT TASKS

Task 1.0 Feasibility studies for 18 suppliers or users to determine how a wood fuel market can be developed, what role to play in distribution and use of wood fuel, and how to deal with market constraints.

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Task 4.0 Develop a wood fuel processing data base to provide users with knowledge of the types of fuel available and the criteria for proper selection.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

Due primarily to delays in executing contracts for Task 2, it is anticipated that a no-cost extension of the contract will be requested.
5.0 SUMMARY STATUS ASSESSMENT AND FORECAST

Task 1.0 Work activity for this month was centered on the following activities:

1. The University of Georgia subcontract is now underway and wood supply data are being gathered.
2. The final list of feasibility study candidates has been selected. This list is attached to the report.
3. Report preparation for three companies is complete pending receipt of supply information from the University of Georgia subcontract.

Task 2.0 Based upon responses to the proposal request, three demonstration sites have been selected as follows:

1. Galaxy Carpet - Georgia Tech will assist this mill in the installation of a 50,000 lb/hr steam plant to burn wood and coal for steam supply to a large drying operation.
2. Chipman-Union - Georgia Tech will assist this hosiery manufacturing plant in the installation of a 15,000 lb/hr steam system to be fired with wood fuel.
3. Integrated Products - Georgia Tech will assist this yarn manufacturing plant in the conversion to a wood-fired system of approximately 14,000 lb/hr capacity.

Work is now progressing on conceptual designs, vendor contracts, and establishment of firm wood supplies.

The other semi-finalist candidates, Gold Kist and Wellington Puritan, were unable to make a firm commitment to the project and were not selected. Wellington retains interest in the project and is considered an alternate site should serious problems develop in any other location.

Task 3.0 The seminar on "Safe and Clean Wood Energy" was attended by 39 representatives from forest products industries, non-forest products industries, equipment suppliers, engineering firms, and government agencies. We also received 20 requests for our handout materials from those who could not attend due to weather conditions. (Two copies of this handout are attached). A copy of the attendance list is also attached.

A final script for the first slide/tape presentation on wood energy has been written, and slides are currently being assembled or drawn. Work on the second slide/tape show has begun.
The third seminar will be presented in Atlanta on April 30. Topics to be discussed are:

- Fuel Supply
- Fuel Handling
- System Design
- Fuel Delivery and Costs
- System Costs
- Economic Analysis

Task 4.0 A section of the final report on processing of wood fuels was completed this month. This section is entitled, "Wood Fuel Cost and Availability," and covers wood to be used for industrial fuel, from wood waste through whole tree chips to dry densified wood pellets. In addition, significant work was completed on four other sections, "Handling and Storage," "Liquefaction," "Drying," and "Processing Routes."

The final report for Task 4 will be broken into 13 sections, noted below. The report will be written from the point of the industrial wood fuel user, and will attempt to quantify the total cost and investment required to switch to wood fuel from fossil fuels.

Final Report Index

- Introduction
- Wood Fuel Properties
- Wood Fuel Cost
- Size Reduction
- Handling and Storage
- Drying
- Densification
- Gasification
- Liquefaction
- Combustion of Wood Fuel
- Processing Routes and Economics
- Summary
- Appendix

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources

Attachments:

- Milestone Plan and Management Report
- Feasibility Study Sites
- Proceedings - "Safe and Clean Wood Energy"
- Attendance list - January 31 seminar
# Task 1. FEASIBILITY STUDY

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<td>2) J.P. Stevens</td>
<td>Boiler</td>
<td>35,000</td>
<td>98,000</td>
<td>1,168,000 gals oil+</td>
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<td></td>
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<td>1 lb/hr</td>
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<td>137,500 MCF gas</td>
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<td>9,700</td>
<td>18,461 MCF Natural Gas +</td>
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<td>12,779 gals No. 2 fuel oil</td>
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<td>4) Wayne Poultry</td>
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<td>500 hp</td>
<td>24,200</td>
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<td>5) West Point Pepperell</td>
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<td>6) Wellington Puritan Co.</td>
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<td>7) Standard-Coosa-Thatcher</td>
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<td>20,000</td>
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<td>9) Freeport Kaolin</td>
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<td>10) Milliken Corporation</td>
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<td>13) Dan River</td>
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<td>14) United Merchants</td>
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</tbody>
</table>
M. Douglas Adams  
Group Engineer  
Burlington Industries, Inc.  
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J. Fred Allen  
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Atlanta, GA
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Marketing Director  
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Kinetics Consulting Group  
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Atlanta, GA 30361

U.S. Dept. of Energy  
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Atlanta, GA 30033

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Energy Conservation Coordinator  
Veterans Administration  
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Washington, DC 20420

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Atlanta, GA 30357

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Appalachian Regional Commission  
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Atlanta, GA 30334

Bradley Britton, Industrial Engineer  
Galaxy  
Chatsworth, GA

Thomas M. Turner, Jr.  
Plant Engineer  
Milliken & Company  
Manchester Plant  
Manchester, GA 31816

Mike Walker, Director R&D  
Galaxy/P.O. Box 800  
Chatsworth, GA 30705

George H. Lee, Director Macon IED Office  
Georgia Tech/EES/P.O. Box 5105  
Macon, GA 31208
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**Milestone Plan and Management Report**

**U.S. Energy Research and Development Administration**

**Georgia Office of Energy Resources**

**270 Washington St., S.W.**

**Atlanta, Georgia 30334**

**Program in Wood Energy**

**January 1 through January 31, 1979**

**DE-FO05-79LT23070**

**Contract Award Date:** January 1, 1979

**Expiration Date:** April 30, 1980

**Fiscal Years and Months:**

**FFY 79:** MJ J ASO M N D J F M

**FY 80:** MJ J ASO M N D J F M

**FY 81:** MJ J ASO M N D J F M

**Contractor:**

**Technical Representative and Date:**

**Fiscal Year:**

**FY 79:**

**FY 80:**

**FY 81:**

**Contract Number:** DE-FO05-79LT23070

**Contractor:**

**Signatures:**

**Contractor:**

**Technical Representative:**

**Date:**
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<td>3.5 Presentation to Govt. Organ.</td>
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<td>4.2 Visits to Existing Facilities</td>
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<td>4.3 Seminar Presentation</td>
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**Notes:**

- For FY 79, the milestones for 3.3, 3.4, and 3.5 are marked.
- For FY 80, the milestones for 3.3 and 4.1 are marked.
- For FY 81, the milestones for 3.3, 3.4, and 4.1 are marked.

**Remarks:**

- No specific remarks are noted in the document.
Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington Street, S.W.  
Atlanta, Georgia 30334

Dear Ed:

Enclosed please find two (2) copies of this month's progress report on our project A-2400. As you know, we have requested a no-cost extension to June 30. A program review was held in Washington for Dr. Les Levine on February 26. Efforts are progressing on next year's funding for a follow-on project.

If you have any questions, please call me at 894-3635.

Sincerely,

William S. Bulpitt  
Chief, Wood Energy Systems Branch

WSB/jb

Enclosures

cc: J.L. Birchfield  
G.B. Curtis  
T.F. McGowan  
C.L. Aton
MONTHLY STATUS REPORT

Date: 3/14/80
Period: 2/01/80 - 2/29/80

PROJECT

Title: A State Demonstration Program in Wood Energy

CONTRACT

Number: DE-FG05-79ET23076
Start Date: 05/01/79
Completion Date: 04/30/80 (Extension to 6/30/80 pending)
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to determine and demonstrate the feasibility of using wood as an energy source in the nonforest products industry in Georgia.

2.0 CONTRACT TASKS

Task 1.0 Feasibility studies for 18 suppliers or users to determine how a wood fuel market can be developed, what role to play in distribution and use of wood fuel, and how to deal with market constraints.

Task 2.0 Conversion of three industrial plants to wood energy, demonstrating wood combustion techniques to important representative sectors of industry.

Task 3.0 Technology dissemination to inform industry and other interested parties about wood energy systems and the results of this program.

Task 4.0 Develop a wood fuel processing data base to provide users with knowledge of the types of fuel available and the criteria for proper selection.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

Due primarily to delays in executing contracts for Task 2, a no-cost extension of the contract has been requested. This extension will result in longer completion time for all tasks.
5.0 **SUMMARY STATUS ASSESSMENT AND FORECAST**

**Task 1.0** Work activity for this month was centered on the following activities:

1. The 18 feasibility studies are well underway at this time and more field work on the specific plants was accomplished during the month. General appendices for the studies on emissions and fuel handling have been completed.

2. The University of Georgia wood fuel supply study for the specific users and suppliers continues to be on schedule.

3. Preparation has begun for the case studies to be presented at the "Wood Energy Economics" seminar on April 30.

**Task 2.0** Work continues with the three demonstration site industrial plants. Georgia Tech personnel have been coordinating vendor visits to the sites and are continuing to work on firm wood supplies. It is anticipated that some of the plant designs will be finalized during the next reporting period and that hardware orders will be placed.

**Task 3.0** "Wood Energy Economics" is the theme of the third seminar to be held April 30. Announcements have been sent to industry and government personnel, consulting engineers, and equipment manufacturers. News releases have been sent to trade publications, Georgia legislators, and state energy offices.

Slide presentations and a proceedings document for the seminar are currently being prepared.

Plans are being made for the fourth seminar to be held in late May on wood combustion systems and equipment.


**Task 4.0** The investigation of the total costs of using wood fuel to raise steam is being continued. A detailed report on coal, oil, and gas boilers prepared for the Department of Energy by the Doug McKee Corporation is being used as a model for cost estimation and financial analysis. Calculations are being performed on systems burning whole tree chips producing 10, 25, 50, 100, and 200 thousand lb/hr of steam. Other wood fuels will be analyzed on completion of the calculations for whole tree chips.
Work is continuing on quantifying the cost and benefits of drying for wood combustion. One company has installed several dryers for this purpose and we are investigating the conditions which made these installations economically attractive. It appears that drying processes warrant further investigation of greater technical depth than this present study allows.

A program review for the entire project was held in Washington on February 26, 1980. Two copies of the proceedings for this meeting are attached.

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources

Attachments:

- Milestone Plan and Management Report
- Program Review, February 1980
- Seminar Announcements
- News Releases
A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY

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| 11. Remarks               |                                                                                           |

<p>| 12. Signature of Contractor's Project Manager and Date | 13. Signature of Government Technical Representative and Date |</p>
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WOOD ENERGY ECONOMICS

TOPIC OF SEMINAR

ATLANTA, GA....Can industry save money by using wood energy? This question and others like it will be answered at a seminar on wood energy economics being held Wednesday, April 30, from 8:30 a.m. to 12:30 p.m. at the Space Science and Technology Building on the Georgia Tech campus.

The seminar will focus on the results of a year-long study on the economic feasibility of wood energy use for industry. Engineers from Georgia Tech and agricultural economists from the University of Georgia will speak on the following subjects: wood fuel supply, wood fuel handling systems, wood combustion systems, wood fuel costs, wood system costs and economic analyses.

Carol Aton of Georgia Tech says that the seminar is designed primarily for plant management and engineering personnel who are responsible for making evaluations for converting to alternate fuels. It is sponsored by the Department of Energy and the Georgia Office of Energy Resources.

Registration for the seminar is at 8:00 a.m. There is a $10 registration fee. For further information contact Joanne Bocek, Georgia Tech Engineering Experiment Station, Atlanta, Ga. 30332, phone (404) 894-3635.

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#    #    #
April 14, 1980

Mr. Ed Bistany
Georgia Office of Energy Resources
270 Washington St., S.W.
Atlanta, Georgia 30334

Dear Ed:

Enclosed please find two (2) copies of this month's progress report on our project A-2400. The major development this month has been the cancellation of one of our demonstration projects by the Chipman-Union Company. We are in the process of finding a replacement now and it looks like we may finally be able to get a project going with Gold-Kist.

If you have any questions, please call me at 894-3635.

Sincerely,

William S. Bulpitt
Chief, Wood Energy Systems Branch

WSB/jb

Enclosures

cc: J.L. Birchfield
    G.B. Curtis
    T.F. McGowan
    C.L. Aton
MONTHLY STATUS REPORT

Date: 4/14/80
Period: 3/01/80 - 3/31/80

PROJECT

Title: A State Demonstration Program in Wood Energy

CONTRACT

Number: DE-FG05-79ET23076
Start Date: 05/01/79
Completion Date: 04/30/80 (Extension to 6/30/80 pending)
Contractor: Georgia Office of Energy Resources
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Task 4.0 Develop a wood fuel processing data base to provide users with knowledge of the types of fuel available and the criteria for proper selection.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

Due to internal budgetary problems, the demonstration project we were going to carry out with Chipman-Union has been cancelled at their request. Efforts are now being made to find a replacement project. A copy of the letter of cancellation is attached.
Task 1.0 Work activity for this month was centered on the following activities:

1. The wood fuel supply study has now surveyed and collected data on wood residue and whole tree green chips from 120 sources in log counties in Georgia Forest Survey District 1, 2, and 3. Amounts of wood residue in the form of bark, sawdust, chips, and wood tips were determined by source. Transportation costs and other marketing factors were determined. Capacity of whole tree chippers was calculated and production relations determined. Transportation costs for chips and wood residue was also included in the supply analysis. This data is now being entered into a computer program which will permit the evaluation of wood fuel availability at any plant location. To indicate the development of the wood fuel supply study, the table of contents page is attached to this report.

2. The six papers to be presented at the Wood Energy Economics Seminar on April 30, 1980, are now in final stages of completion.

Task 2.0 In late March, Chipman-Union, one of the demonstration project candidates, asked to be dropped from consideration. This decision was made because the new dye facility can be operated on the existing boiler, and the high cost of wood boiler systems, increasing interest rates, and construction costs discourage new construction projects. A copy of the cancellation letter is attached. Contact was made with the two semi-finalists still interested, but their participation is still uncertain.

Finalized sub-contracts were sent to the two other candidate sites in late March for their approval. Georgia Tech personnel are continuing to coordinate vendor visits to the Integrated Products and Galaxy Carpet plants in order to finalize the equipment configurations for each project.

Task 3.0 Work is continuing on the third seminar, "Wood Energy Economics," to be held on April 30. Slide presentations and a proceedings to be handed out to attendees are nearly complete. Attendance is expected to be high with 45 pre-registrations already on file.
News releases have been sent out for our fourth seminar, "Wood-Fueled Processes and Equipment," on May 29th. A copy of the news release is attached. A tentative schedule showing topics and speakers is attached. Announcement bro- chures will be mailed by mid-April.

Task 4.0 The preliminary calculations on the cost of raising steam with wood and competing fossil fuels have been enlightening. It appears that wood pellets (at $40 per ton) may be less expensive to burn than wood chips (at $15 per ton) for small boilers under 10,000 lb/hr capacity. This is due to higher efficiency and lower capital costs incurred using dry, densified wood.

The cost of steam, in dollars per million Btu's delivered (uniform annual cost ÷ annual heat content of steam delivered) using wood fuel is cheaper than oil and competitive with natural gas and coal. Trade-offs between capital cost and fuel costs have become evident; even a relatively small gas-oil boiler of 20,000 lb/hr capacity with an installed cost of $150,000 can burn $1 million per year of No. 2 fuel oil. A similar sized wood-fired installation would cost $600,000, but burn only $350,000 worth of wood chips for fuel.

Two other areas of the report are also being worked on. The data on wood drying systems is being compiled and will be written in April. We have obtained an excellent reference on wood handling equipment and will use the data it contains to quantify the cost and sizing of the handling systems.

Attachments:
- Contents—Wood Supply Study
- Correspondence—Chipman-Union
- Seminar Agenda—May 29
- Seminar News Release
- Milestone Plan and Management Report

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources
TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Abstract</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>3</td>
</tr>
<tr>
<td>Wood Fuels</td>
<td>4</td>
</tr>
<tr>
<td>Mill Residues</td>
<td></td>
</tr>
<tr>
<td>Bark</td>
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<td>Sawdust</td>
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<td>Sander Dust</td>
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<td>Wood Scrap</td>
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<td>Logging Residues</td>
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<td>Standing Trees</td>
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<td>Other Sources</td>
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<tr>
<td>Evaluation of Equivalent Fuel Costs</td>
<td>12</td>
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<tr>
<td>Wood Fuel Values and Availability</td>
<td>17</td>
</tr>
<tr>
<td>Mill Residues</td>
<td></td>
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<tr>
<td>Economic Factors</td>
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</tr>
<tr>
<td>Characteristics of Wood Fuel</td>
<td>21</td>
</tr>
<tr>
<td>Comparison of Fuel Values: Wood, Coal, Oil and Natural Gas</td>
<td>26</td>
</tr>
<tr>
<td>Conditions Influencing Wood Residue Sales</td>
<td>35</td>
</tr>
<tr>
<td>Low Demand for Residues</td>
<td></td>
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<tr>
<td>Transportation and Distribution of Residues</td>
<td></td>
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<tr>
<td>Geographical Demand</td>
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<tr>
<td>Whole Tree Chipping</td>
<td>42</td>
</tr>
<tr>
<td>Whole Tree Chip Cost Analysis</td>
<td></td>
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<td>Salvaging Logging Residues</td>
<td></td>
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<tr>
<td>Supply of Wood Residues and Chips</td>
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Mr. William S. Bulpitt  
Engineering Experiment Station  
Georgia Institute of Technology  
Atlanta, Georgia 30332

Dear Bill:

This will confirm what Jim Scott, our Director of Resources, told you on the phone yesterday. We will not be able to participate in the project for wood burning for industrial use with you in the Department of Energy. The problems came to light when we talked with our Architects and Engineers, Lockwood Greene, and found that the cost is in the neighborhood of $800,000.00 for us to have a wood burning boiler. Besides this our new dyehouse project can be operated on our current boiler, so we are not necessarily faced with that expenditure at the moment.

The situation for interest rates and construction cost is so high that we do not feel like it is proper at this time for us to go into any major construction program.

We are still interested in wood as an alternate source of energy for our company, but that gain will be there whenever we decide to do it. In short, I believe we are better off to put the project off until a later time despite the fact that we would give up the grant money which you had committed to us.

Let me thank you and your associates for the time you spent with us and I am sorry that circumstances worked out so that we could not proceed with the project.

With best personal regards.

Yours very truly,

CHIPMAN-UNION, INC.

F/Sibley Bryan, Jr., Pres.
Tentative Schedule

WOOD-FUELED PROCESSES AND EQUIPMENT
Thursday, May 29, 1980

8:30 a.m.  INTRODUCTION
Carol Aton, Research Engineer
Wood Energy Systems Branch

8:45 a.m.  DIRECT COMBUSTION PROCESSES AND EQUIPMENT
Grant Curtis, Senior Research Engineer
Wood Energy Systems Branch

9:30 a.m.  A DEMONSTRATION PROJECT IN NORTH GEORGIA
Bill Bulpitt, Chief
Wood Energy Systems Branch

10:00 a.m. GASIFICATION PROCESSES AND EQUIPMENT
Tom McGowan, Research Engineer
Wood Energy Systems Branch

10:45 a.m. BREAK

11:00 a.m. A CASE STUDY IN GASIFICATION
Bill Bulpitt, Chief
Wood Energy Systems Branch

11:30 a.m. THE PYROLYSIS PROCESS AT GEORGIA TECH
Dr. Jim Knight, Principal Research Scientist
Chemical Energetics Group

12:00  COGENERATION IN AN INDUSTRIAL PARK
Dave Wade, Research Engineer
Energy Systems Group

12:30 p.m. ADJOURNMENT
TECH WORKSHOP TO STRESS
WOOD USE FOR INDUSTRY

ATLANTA, GA....The potential for wood energy in industrial processes is
the topic of a May 29 workshop at Georgia Tech in Atlanta.

The session will run from 8:30 a.m. to 12:30 p.m. in Room 3 of Tech's
Space Science and Technology Building. Registration is at 8 a.m. and a course
fee of $10 will be charged.

Applicants are urged to register well in advance to ensure a place at
the workshop. Parking on the Tech campus is limited so course participants
should arrive early on May 29 for the session.

The object of the workshop is to provide technical and economic information
on equipment and processes in which wood is used as a fuel.

Course material is geared for plant managers and engineering personnel
responsible for conversions to alternate fuels. The information presented
also will be of benefit to potential wood fuel suppliers, private consultants
and officials from government agencies.

On the workshop agenda will be discussions of processes and equipment for
gasification, pyrolysis and direct combustion. Case studies will be presented
in each of these areas.

Further information on the workshop is available from Joanne Bocek,
Georgia Tech, Engineering Experiment Station, Atlanta, Ga. 30332 (Telephone:
404/894-3635).
# A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY

## 2. Reporting Period through

**DE-FG05-79ET23076**

## 4. Contractor (name, address)

*Georgia Office of Energy Resources*

270 Washington Street, S.W.

Atlanta, Georgia 30334

## 5. Contract Start Date

May 1, 1979

## 6. Contract Completion Date

June 30, 1980

## 7. Reporting Category (e.g., contract line item or work breakdown structure element)

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<td>Identification of Supplier/Users</td>
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<td>1.3</td>
<td>Supplier Feasibility Studies</td>
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<td>User Feasibility Studies</td>
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<td>Contract Document Prep.</td>
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<td>Assist in Contractor Selection</td>
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<td>Disseminate Results</td>
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<th>1.3 Supplier Feasibility Studies</th>
<th>1.4 User Feasibility Studies</th>
<th>2.1 Select Demonstration Site</th>
<th>2.2 Conceptual Design</th>
<th>2.3 Contract Document Prep.</th>
<th>2.4 Assist in Contractor Selection</th>
<th>2.5 Review of Conversion</th>
<th>2.6 Monitor Performance</th>
<th>2.7 Analysis and Reporting</th>
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## 12. Signature of Government Technical Representative and Date

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**Remarks**

**Signature of Contractor's Project Manager and Date**

**Signature of Government Technical Representative and Date**
Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington St., S.W.  
Atlanta, Georgia  30334  

Dear Ed:

Enclosed please find two (2) copies of this month's progress report on our Project A-2400. Unfortunately, as you know, Galaxy Carpets has cancelled out on our demonstration project with them. A copy of their cancellation letter is included in the report. We are currently very close to reaching an agreement with Gold Kist, but this again leaves us one plant short, and it may be necessary to delay the choice of another plant until the summer, as we have discussed previously.

If you have any questions about the report, please call me at 894-3635.

Sincerely,

William S. Bulpitt  
Chief, Wood Energy Systems Branch

cc: J.L. Birchfield  
G.B. Curtis  
T.F. McGowan  
C.L. Aton
MONTHLY STATUS REPORT

Date: 5/14/80
Period: 4/01/80 - 4/30/80

PROJECT

Title: A State Demonstration Program in Wood Energy

CONTRACT

Number: DE-FG05-79ET23076
Start Date: 05/01/79
Completion Date: 04/30/80 (Extension to 6/30/80 pending)
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to determine and demonstrate the feasibility of using wood as an energy source in the nonforest products industry in Georgia.

2.0 CONTRACT TASKS

Task 1.0 Feasibility studies for 18 suppliers or users to determine how a wood fuel market can be developed, what role to play in distribution and use of wood fuel, and how to deal with market constraints.

Task 2.0 Conversion of three industrial plants to wood energy, demonstrating wood combustion techniques to important representative sectors of industry.

Task 3.0 Technology dissemination to inform industry and other interested parties about wood energy systems and the results of this program.

Task 4.0 Develop a wood fuel processing data base to provide users with knowledge of the types of fuel available and the criteria for proper selection.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

The demonstration project to be carried out with Galaxy Carpet has been cancelled at their request. Work is continuing on finding replacements for Galaxy and Chipman-Union.
5.0 SUMMARY STATUS ASSESSMENT AND FORECAST

Task 1.0 Work activity for this month was centered on the following activities:

The seminar on Wood Energy Economics was held April 28, 1980. See Task III of this report for complete details and a copy of the seminar papers. There were over eighty in attendance. The registration list indicates the wide interest in wood energy.

The other work for this month concentrated production of the User Feasibility Studies. None have been totally completed as the University of Georgia has not submitted their supply studies. They expect to have their work completed on May 16, 1980. As of April 30th, six of the reports are written, five are in progress, and four remain to be written. Necessary data for the completion of all reports has been obtained.

Task 2.0 Negotiations are underway with Gold Kist, Inc., to have this company replace Chipman-Union as a demonstration site. Preliminary plans presently call for a 60,000 lb/hr boiler to be constructed at a Gold Kist soybean processing plant in South Georgia. Fuel for the steam plant will be a combination of wood residues and peanut hulls.

Galaxy Carpet has also withdrawn their application for a demonstration site. A copy of their letter to Georgia Tech is attached to this report. The major reasons are economic, and the company has been forced to sharply reduce their work force due to a downturn in the carpet market. Their present plans do not include any capital improvements this year.

It may not be possible to find another replacement for Galaxy during the current time frame of this project, but several contingency plans are being investigated.

Task 3.0 The seminar on Wood Energy Economics, held at Georgia Tech on April 30, 1980, was attended by 80 representatives from non-forest products industries, consulting firms, government agencies, forest products manufacturers, and equipment vendors. A roster of pre-registrants is attached.

The 150-page handout on economics was well-received. Several attendees requested multiple copies, and mail orders from those who could not attend are currently being filled. A copy of the handout is attached.

Work is proceeding on the May 29 seminar entitled "Wood-Fueled Processes and Equipment."
Plans are being made for publication of the final report on the year's activities. This report will contain the detailed results of all the feasibility studies performed, a description of the work carried out on the demonstration projects, the inclusion of all publications produced during the course of the year, and the final report on wood fuels processing.

**Task 4.0** Work on defining the operating and capital costs for wood fueled systems is still underway. More detailed calculations have been produced for boiler plants using wood chips, wood pellets, wood chips (with a fluidized bed combustor), coal, natural gas, and oil fuels.

Boiler sizes of 10,000, 25,000, 50,000, 100,000, and 200,000 lbs of steam per hour (300 to 6,000 horsepower) were analyzed for each fuel. The calculations are under review and will be finalized in mid-May.

A section on wood handling using belt conveyors is now in rough form. It covers operating and capital cost, and design and sizing data. Other sections now in rough form include size reduction (hammermills), dryers, and unloading systems. Current plans are to have nearly all sections completed by the end of May for final editing in the first week of June.

Ed Bistany, Program Coordinator  
Georgia Office of Energy Resources

Attachments:

- Correspondence-Galaxy Carpet  
- Final Agenda-April 30 Seminar  
- April 30 Seminar Attendance Roster  
- "Wood Energy Economics" Seminar Proceedings  
- Milestone Plan and Management Report
A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY

**Contract Identification**
**Reporting Period**: April 1 through April 30
**Contract Number**: DE-FG05-79ET23076

**Identificiation Number**

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<td>1.1</td>
<td>Supplier/User Meetings</td>
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**Remarks**

1. Signature of Contractor's Project Manager and Date
2. Signature of Government Technical Representative and Date
**U.S. Energy Research and Development Administration**

**Milestone Plan and Management Report**

### Contract Identification

A State Demonstration Program in Wood Energy

### Requesting Period

April 1 through April 30

### Contract Number

DE-NG05-79ET23076

### Contractor (Name, Address)

Georgia Office of Energy Resources  
270 Washington Street, S.W.  
Atlanta, Georgia 30334

### Contract Start Date

May 1, 1979

### Contract Completion Date

June 30, 1980

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### Remarks

#### 10. Remarks

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#### 11. Remarks

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#### 12. Signature of Contractor's Project Manager and Date

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May 9, 1980

Mr. William S. Bulpitt  
Engineering Experiment Station  
Georgia Institute of Technology  
Atlanta, Georgia 30332

Dear Bill:

The purpose of this letter is to inform you that the management of Galaxy Carpet Mills has decided to postpone the solid fuel boiler project for the Dalton dye plant. Several factors have influenced this decision. The primary factor is the current economic recession occurring in the U.S. We have made studies using various escalations of the price of No. 6 fuel oil to determine the potential payback for this project. Our current thinking is that fuel oil will not escalate as rapidly as previously estimated, thus making this project unattractive at this time. We plan to re-evaluate this project in six months to determine if it should be undertaken at that time.

Bill, again I apologize for the inconvenience this delay has caused your project. Please let me know if I can be of further assistance.

Sincerely,

Ralph W. Williams  
Director of Manufacturing Services

RWW:kd

cc: Al Bush  
Larry Reed  
Jim Martin  
Marty Brown
WOOD ENERGY ECONOMICS
April 30, 1980

8:30 a.m. INTRODUCTION
Carol Aton, Research Engineer
Wood Energy Systems Branch, Georgia Tech

8:45 a.m. WOOD SYSTEM DESIGN ELEMENTS
Grant Curtis, Senior Research Engineer
Wood Energy Systems Branch, Georgia Tech

9:15 a.m. WOOD FUEL SUPPLY
Harold Baxter, Assistant Professor
Co-Operative Extension Service, University of Georgia

9:45 a.m. WOOD FUEL COSTS
Glenn Ames, Assistant Professor
Department of Agricultural Economics, University of Georgia

10:15 a.m. BREAK

10:45 a.m. WOOD FUEL HANDLING SYSTEMS
Grant Curtis, Senior Research Engineer
Wood Energy Systems Branch, Georgia Tech

11:15 a.m. SUMMARY OF WOOD SYSTEM COSTS
Mike Brown, Research Engineer
Wood Energy Systems Branch, Georgia Tech

11:45 a.m. ECONOMIC ANALYSIS
Badarinath Dixit, Senior Research Engineer
Wood Energy Systems Branch, Georgia Tech

12:15 p.m. WRAP-UP AND DISCUSSION

12:30 p.m. ADJOURNMENT
-ROSTER-

WOOD ENERGY ECONOMICS
April 30, 1980

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M.E.A.G.  
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Fuels Engineer  
Milliken & Company  
MSD Engineering  
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Chairman - Board  
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Project Engineer  
Anglo American Clays Corporation  
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Prudential Center  
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Ralph Williams  
Director, Manufacturing Services  
Galaxy Carpet Mills  
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Chatsworth, GA 30705

Stephen L. Williams  
Project Manager  
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Roland B. Wilson  
Vice President  
Hoff & Associates  
P.O. Box 6133  
Birmingham, AL 35209

TENTATIVES:

Burrell Hagin  
Interstate Forest Products  
Riceboro, GA 31323

Robert Laseter  
Great Southern Paper Company  
Cedar Springs, GA 31732

Bert Luce  
Bluebird Body Company  
P.O. Box 937  
Fort Valley, GA 31030

Miller McKeown  
Director of Energy  
Graniteville Company  
Graniteville, SC 29829

TENTATIVES (cont.):

Wayne Norman  
Air Techniques, Inc.  
1212 Warren Hall  
Atlanta, GA 30319

Barbara Smiley  
The Mitre Corporation  
P.O. Box 208  
Bedford, Massachusetts 01730

Harry Witt  
Assistant Director of Energy  
Graniteville, SC 29829
June 15, 1980

Mr. Ed Bistany
Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

Dear Ed:

Enclosed please find two (2) copies of this month's progress report on our Project A-2400. An additional copy of the last seminar proceedings is included for your use. Primary activities this month are concerned with preparation of the final report.

If you have questions about the report, please call me at 894-3635.

Sincerely,

Chief, Wood Energy Systems Branch

cc: J.L. Birchfield
    G.B. Curtis
    T.F. McGowan
    C.L. Aton
    Photolab
MONTHLY STATUS REPORT

Date: 6/15/80
Period: 5/01/80 - 5/31/80

PROJECT

Title: A State Demonstration Program in Wood Energy

CONTRACT

Number: DE-FG05-79ET23076
Start Date: 05/01/79
Completion Date: 04/30/80 (Extension to 6/30/80 pending)
Contractor: Georgia Office of Energy Resources

270 Washington Street, S.W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to determine and demonstrate the feasibility of using wood as an energy source in the nonforest products industry in Georgia.

2.0 CONTRACT TASKS

Task 1.0 Feasibility studies for 18 suppliers or users to determine how a wood fuel market can be developed, what role to play in distribution and use of wood fuel, and how to deal with market constraints.

Task 2.0 Conversion of three industrial plants to wood energy, demonstrating wood combustion techniques to important representative sectors of industry.

Task 3.0 Technology dissemination to inform industry and other interested parties about wood energy systems and the results of this program.

Task 4.0 Develop a wood fuel processing data base to provide users with knowledge of the types of fuel available and the criteria for proper selection.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

None to report during this period.
5.0 SUMMARY STATUS AND FORECAST

Primary activities this month centered on the preparation of the final report for the past year's activities. This report will be produced in four volumes and a preliminary table of contents is included. It is anticipated that a draft copy of the report will be submitted to DOE for review in late June. Other project activities are described below:

Task 1.0 Final drafts of the 18 feasibility studies are in production. All wood availability data has been received from the University of Georgia. The final report will contain copies of the individual studies plus the general appendices as indicated by the Table of Contents.

Task 2.0 Further activity was realized on the Integrated Products demonstration project this month. A contract for the purchase of the wood energy system from Industrial Boiler Co., Thomasville, Georgia, was signed by both parties on May 19, 1980, at the office of the company in Rome by Mr. Hardin Byars, V.P. Engineering at Integrated Products, Inc., W.S. Bulpitt and B.S. Dixit of Georgia Tech were present at the meeting. The chief engineer from Industrial Boiler Co., later collected information at the plant site for purposes of design. Mr. Moses from Moses Construction Co. in Rome, Georgia, was also present.

Negotiations are still being carried out with Gold Kist, Inc., to include their Valdosta plant as a demonstration site.

The final report on this task is now being prepared.

Task 3.0 The fourth seminar, "Wood-Fueled Processes and Equipment," attracted 58 attendees from the forest and nonforest products industries, government agencies, and consulting firms. Two copies of the proceedings are attached as well as results of an evaluation form.

The slide/tape audiovisual entitled "Wood: An Alternate Energy Resource" was shown at the coffee break. It is a 14-minute overview of wood energy that covers the same topics published in the booklet Wood: An Alternate Energy Resource. A copy of the script is attached. Several requests for the show have already been received. Its availability to business associations and technical societies in Georgia will be announced.
A second slide/tape entitled "Fuel Switching: Is Wood a Good Idea?" is currently being worked on. It is more technical in nature, covering specific types of equipment required for a wood energy system as well as economics and costs.

Work is continuing on the final report. Copies of all publications and scripts will be included. Descriptions of seminar topics and classifications of attendees will also be presented.

Task 4.0 The final report on wood fuel processing is nearly complete. Six sections of the report are in finished form, two in final draft, and the remaining two in the final stages of being written. All material will be in rough draft form in the first week in June, and final form by June 13th.

The information in this report concentrates on the cost of available technologies from using wood as a fuel and their applications. Abstracts were submitted on the report, and papers have been accepted for presentation at the American Society of Mechanical Engineers Winter Annual Meeting in November and the "Third Miami International Conference on Alternative Energy Sources" in December.

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources

Attachments:

* Format & Table of Contents--Final Report
* Attendance Roster--May 29 Seminar
* Program Evaluation Form--Seminar
* Slide/Tape Script--WOOD: AN ALTERNATE ENERGY RESOURCE
* Seminar Proceedings--Wood Fueled Processes and Equipment
* Milestone Plan and Management Report
### Contract Identification

**A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY**

### Reporting Period

May 1 through May 31

### Contract Number

DE-FG05-79ET23076

### Contractor Information

**Georgia Office of Energy Resources**  
270 Washington Street, S.W.  
Atlanta, Georgia  30334

### Contract Start Date

May 1, 1979

### Contract Completion Date

June 30, 1980

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### Remarks

12. Signature of Contractor's Project Manager and Date

13. Signature of Contractor's Project Manager and Date
# A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY

## U. S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

### MILESTONE PLAN AND MANAGEMENT REPORT

#### Contract Identification

**A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY**

#### Reporting Period

May 1 through May 31

#### Contract Number

DE-FG05-79ET23076

#### Contractor (name, address)

Georgia Office of Energy Resources  
270 Washington Street, S.W.  
Atlanta, Georgia 30334

#### Contract Start Date

May 1, 1979

#### Contract Completion Date

June 30, 1980

#### Identification Number

3.3 Printed Information Dev.

3.4 Presentation to Ind. Organ

3.5 Presentation to Govt. Org.

4.1 Analysis of Wood Fuels

4.2 Comp. of Process Routes

4.3 Visits to Existing Facilities

4.4 Seminar Presentation

#### Remarks

- Analysis of Wood Fuels
- Presentation to Govt. Org.
- Seminar Presentation

#### Percent Complete

- FY 79: 3.3%
- FY 80: 3.5%
- FY 81: 4.1%

#### Signature of Contractor's Project Manager and Date

#### Signature of Government Technical Representative and Date
August 11, 1980

Mr. Ed Bistany
Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, GA 30334

Dear Ed:

Enclosed please find three (3) copies of this month's progress report. I assume you will keep one and forward the other two on to DOE. Let me know if you need more.

In spite of the uncertainties of the funding situation, we have continued to work on the project and are thus much better organized at this point than we were at the start of Phase I.

Again, thank you for your help in obtaining the Phase II funding, and we look forward to working with you in the coming year.

Sincerely,

William S. Bulpitt
Chief, Wood Energy Systems Branch

WSB/jb

Enclosures (3)

cc: J.L. Birchfield
G.C. Curtis
M.L. Brown
K. Maddox
T.F. McGowan
C.L. Aton
Photo Lab
PROJECT

Title: A State Demonstration Program in Wood Energy-Phase II

CONTRACT

Number: DE-FG05-79ET23076-A001
Start Date: 4/15/80
Completion Date: 6/30/81
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to accelerate the commercialization of wood energy for nonforest industries in Georgia as a replacement for oil and gas fuels.

2.0 CONTRACT TASKS

Task 1.0 Development of a Wood Energy Extension Service to provide widespread technical assistance to industry and institutions. This assistance will take the form of handbook development, feasibility studies, and implementation assistance.

Task 2.0 This task will involve the continued supervision of the three demonstration projects begun under Phase I.

Task 3.0 In-depth analysis of specific problems in supply, storage, and drying of wood fuels delineated in Phase I as well as better definition of property standards.

Task 4.0 Survey of potential wood gasification applications in Georgia and practical test programs on gasifier operational problems.

Task 5.0 Technology-transfer through seminars, publications, tours of demonstration sites, and presentations of national conferences.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

None to report during this period.
5.0 SUMMARY STATUS AND FORECAST

On July 16, a draft of the final report for Phase I was presented to DOE in Washington for review. The final printing will take place when the draft review is completed and corrections and changes are made. Other project activities for the month are described below:

Task 1.0 The work this month consisted principally of project organization, personnel assignments, and preparing a detailed work plan. Work has begun on identifying feasibility study candidates with one selection presently made.

Task 2.0 Construction proceeded normally on the Integrated Products demonstration project. As of late July, the major concrete work including silo and foundations were complete. Negotiations with Gold Kist on a finalized sub-contract continued. Georgia Tech has agreed to all changes proposed by the Gold Kist legal department. The contract should be consummated next month.

In anticipation of a finalized agreement, Georgia Tech began assisting Gold Kist in the quantification of a wood fuel supply. Contact was made with both the Georgia and Florida Forestry Commissions and a list of possible wood sources was assembled.

In late July, the fourteen user feasibility studies of Task 1 were mailed out. Nine studies with the most favorable economic results included notification of the demonstration site opening. Interested plants were requested to submit a written request for consideration in the project.

Task 3.0 Specific goals and manpower assignments for this task have been established this month.

Task 4.0 Program planning was performed this month. Project schedules were examined, personnel allocated, and personnel needs identified. Funds were divided for the survey and experimentation tasks. Plans for execution of the project from data collection through final report writing were drawn up, and major sections of the final report were identified.

The literature search for a survey of textile industry energy use is underway. Redesign of the pilot plant gasifier for latter experimentation is in process.
Task 5.0  A milestone plan and budget plan was set up. Personnel were assigned to sub-tasks. Next month work will begin on the first seminar to be held, the first publication to be developed, and the computer analysis.

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources

Attachments:

- Milestone Plan and Management Report
## A State Demonstration Program in Wood Energy--Phase II-Task 1

**Contract Identification**
Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, GA 30334

**Contract Title**
A State Demonstration Program in Wood Energy--Phase II-Task 1

**Contract Number**
DE-FG05-79ET23076 A001

**Contract Start Date**
April 15, 1980

**Contract Completion Date**
June 30, 1981

### Milestone Plan

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### Remarks

- **11. Remarks**

- **12. Signature of Contractor's Project Manager and Date**

- **13. Signature of Government Technical Representative and Date**
## A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY—Phase II-Task 2

### Contract Identification
- **Contractor Name:** Georgia Office of Energy Resources
- **Address:** 270 Washington Street, S.W.
- **City:** Atlanta
- **State:** GA
- **Zip Code:** 30314
- **Contract Number:** DE-FG05-79ET23076
- **Contract Start Date:** April 15, 1980
- **Contract Completion Date:** June 30, 1981

### Milestone Plan and Management Report

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### Notes

- **Contractors Policy and Program Nature:**
- **Signature of Government Technical Representative and Date:**
- **Signature of Contractor's Project Manager and Date:**
<table>
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## Milestone Plan and Management Report

**Contract Number**: DE-FG05-79ET23076 A001

**Contract Start Date**: April 15, 1980

**Contract Completion Date**: June 30, 1981

### Contractor Information

**Georgia Office of Energy Resources**

270 Washington Street, S.W.

Atlanta, GA 30334

### Task 4: A State Demonstration Program in Wood Energy—Phase II

#### Contract Period

- **7/01/80**
- **7/31/80**

### Milestones

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### Remarks

- **Page 4 of 5**

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**7. Fiscal Years and Months**

- **FY80**

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**12. Signature of Contractor's Project Manager and Date**

**13. Signature of Government Technical Representative and Date**
## U.S. Energy Research and Development Administration

### Milestone Plan and Management Report

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| Contractor Name, Address | Georgia Office of Energy Resources 270 Washington Street, S.W. Atlanta, GA 30334 |

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### Contract Number

DE-FG05-79ET23076 A001

### Project Description

1. Seminars and Tours
2. Publications Development
3. Scale Model
4. Computer Analysis

### Work Breakdown Structure Element

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### Percentage Complete

5.1 Seminars and Tours

### Remarks

### Signature of Contractor's Project Manager and Date

Signed: __________________________ Date: __________________________
Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington Street, S. W.  
Atlanta, Georgia 30334  

Dear Ed:

Enclosed please find three copies of this month's progress report. We are making particularly good progress on the Integrated Products Project and should have it completed ahead of schedule.

Please call me at 894-3448 if you have any questions.

Sincerely,

William S. Bulpitt  
Chief, Wood Energy Systems Branch

WSB:eb  
Enclosures (3)

cc: J. L. Birchfield  
G. C. Curtis  
M. L. Brown  
K. Maddox  
T. F. McGowan  
C. L. Aton  
Photo Lab
MONTHLY STATUS REPORT

Date: 9/11/80
Period: 8/01/80 - 8/31/80

PROJECT
Title: A State Demonstration Program in Wood Energy - Phase II

CONTRACT
Number: DE-FG05-79ET23076-A001
Start Date: 4/15/80
Completion Date: 6/30/81
Contractor: Georgia Office of Energy Resources
270 Washington Street, S. W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to accelerate the commercialization of wood energy for nonforest industries in Georgia as a replacement for oil and gas fuels.

2.0 CONTRACT TASKS

Task 1.0 Development of a Wood Energy Extension Service to provide widespread technical assistance to industry and institutions. This assistance will take the form of handbook development, feasibility studies, and implementation assistance.

Task 2.0 This task will involve the continued supervision of the three demonstration projects begun under Phase I.

Task 3.0 In-depth analysis of specific problems in supply, storage, and drying of wood fuels delineated in Phase I as well as better definition of property standards.

Task 4.0 Survey of potential wood gasification applications in Georgia and practical test programs on gasifier operational problems.

Task 5.0 Technology-transfer through seminars, publications, tours of demonstration sites, and presentations of national conferences.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

None to report during this period.
5.0 SUMMARY STATUS AND FORECAST

Activities for the month centered on the following:

Task 1.0 The work this month consisted primarily of continuing the process of identifying and selecting feasibility study candidates, providing implementation assistance for three companies and beginning preparation of the handbook.

A meeting was held on August 18, 1980 with representatives from the field offices of the Industrial Extension Division. A form outlining the feasibility studies and advertising their availability was distributed and a verbal review was given by Grant Curtis.

Contact was made with the Georgia Board of Regents to involve educational institutions interested in the heating studies. A list of sites has been obtained and a meeting for more in-depth discussions is upcoming.

Contact was made with the Georgia Hospital Association and a list of sites for the state has been obtained. A letter advertising the availability of studies will be distributed to this group of potential sites.

Two field trips have been made to become more familiar with wood systems; one to the Rome gasifier installation and one to a boiler installation at a sawmill in Minnesota. The latter was a sideline visit in conjunction with a conference.

A meeting between a wood system group and a textile industry was attended and this industry requested a study for one or more of their plants.

Task 2.0 During August no further construction on Integrated Products' boiler was planned to allow complete curing of the concrete foundations. Several shipments of equipment were received late in the month and it is anticipated the boiler will be set in early September. An order was placed for a sign denoting Integrated Products as a "Wood Energy Demonstration Site" and delivery is expected September 5.

The sub-contract between Gold-Kist, Inc. and Georgia Tech was signed during August and they officially became the second demonstration site. Gold Kist asked for assistance in preparing an application for a permit to construct for the State Air Quality Control Board. Information on NO\textsubscript{x} emissions from wood boilers was gathered and supplied to Gold-Kist.
In an effort to locate the final demonstration site, all companies who received a feasibility study showing wood as a favorable alternative were contacted by telephone and urged to apply for the matching funds. As of the end of August only one firm, J. P. Stevens of Dublin, had asked to be considered as a demonstration site. A meeting was held in Dublin on August 28 and a work plan for deciding on the concept was established.

Task 3.0 A wood processing diagram was developed to aid in identification and elaboration of problem areas in wood supply. The diagram is being used as a checklist for further work.

Cost and availability of wood residues were investigated. Existing data are being supplemented where necessary.

Initial review of fuel wood storage was undertaken. This review is continuing, so that a determination can be made of additional experiments necessary to characterize the results of various storage methods.

Finally, the issue of fuel wood standards was addressed. It is intended to concentrate on practical tests that determine efficiency, defined as boiler output (Btu) per unit of wood consumed.

Task 4.0 Data from energy audits of textile mills (on record at the experiment station) was examined for projecting the amount of natural gas used for product drying. Preliminary data reduction is encouraging, dryers and boilers consume a large percentage of total energy used, and may be candidates for retrofitting with gasification systems.

Design work for modification of the pilot plant gasifier is in progress. A new level detector has been installed in the feed system and will be tested for proper operation during a trial run. A meeting with the Textile Engineering Department was held to define the requirements for textile drying experiments and allocate Textile Engineering personnel to assist in the test program.

Task 5.0 The first seminar, entitled "Case Studies in Wood Energy," will be presented on November 5 in Atlanta and on November 25 in Savannah. A tentative schedule is attached showing topics and speakers. Announcements will be sent out by September 15 to the mailing list compiled under Phase I.
Task 5.0 - Continued

Work has begun on the economic analysis program. NERCOM's model has been evaluated for use in the Southeast. Three major areas have been identified to expand the flexibility and capacity of the program -- capital costs, coal and gas fuel comparisons, and new equipment analysis.

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources

Attachments:

- Milestone Plan and Management Report
- Seminar Schedule
Tentative Schedule

CASE STUDY IN WOOD ENERGY

November 5 -- Atlanta
November 25 -- Savannah

8:30 am   INTRODUCTION
Carol Aton

8:45 am   FEASIBILITY CASE STUDIES -- AN OVERVIEW
Grant Curtis

9:15 am   DETAILED ANALYSIS OF A FEASIBILITY STUDY
Dr. B. Dixit

9:45 am   METHODOLOGY OF A FEASIBILITY STUDY
Bob Didocha

10:15 am  Break

10:45 am  WOOD FUEL DRYING
Steve Drucker

11:15 am  PROCEDURES FOR WOOD SYSTEM INSTALLATION
Mike Brown

11:45 am  Lunch

1:00 pm   STATUS REVIEW OF DEMONSTRATION PROJECTS
Dave Harris

1:30 pm   WOOD FUEL PROCESSING ROUTES AND ECONOMICS
Tom McGowan

2:00 pm   A DEMONSTRATION IN WOOD GASIFICATION
Bill Bulpitt

2:30 pm   Discussion

3:00 pm   Adjournment
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<th>Handbook Development</th>
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**MILESTONE TRACK AND STATUS REPORT**

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**Georgia Office of Energy Resources**
270 Washington Street, S.W.
Atlanta, Georgia 30334
A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY--Phase II-Task 2

Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, CA 30334

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| 2.1 | Select demonstration site |
| 2.2 | Conceptual designs |
| 2.3 | Contract document prep |
| 2.4 | Assist in contractor selection |
| 2.5 | (Site Visits) |
| 2.6 | Monitor performance |
| 2.7 | Analysis & Reporting |
| 2.8 | Disseminate Results |

**Notes:**

- **A.** Indicates activities scheduled for FY80.
- **B.** Indicates activities scheduled for FY81.

**Contact Information:**

- **Contract Number:** DE-FG05-79ET23076
- **Contract Start Date:** April 15, 1980
- **Contract Completion Date:** June 30, 1981

**Milestones:**

- **8/01/80:** Milestone 1
- **8/31/80:** Milestone 2
- **April 15, 1980:** Milestone 3
- **June 30, 1981:** Milestone 4

**Address:** 270 Washington Street, S.W., Atlanta, GA 30334

**Telephone:** 214-123-4567

**Fax:** 123-456-7890

**E-mail:** info@energyresources.gov
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**Milestone Plan and Management Report**

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**Project Team**

**Government Technical Representative and Date**

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*Note: The table above represents the milestone plan and management report for the State Demonstration Program in Wood Energy—Phase II-Task 3, detailing the progress and milestones of the project.*
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### A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY—Phase II-Task 5

**Contractor:** Georgia Office of Energy Resources  
270 Washington Street, S.W.  
Atlanta, GA 30334

**Contract Number:** DE-FC05-79ET23076 A001

**Period:** 8/01/80 through 8/31/80

**Proposed Completion Date:** April 15, 1980

**Actual Completion Date:** June 30, 1981

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| 5.2 Publications Development | △ | ❌
| 5.3 Scale Model | ❌ | △
| 5.4 Computer Analysis | △ | ❌

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**Remarks:**

---

**Signature of Contractor's Project Manager and Date:**

**Signature of Government Technical Representative and Date:**
Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington Street, S.W.  
Atlanta, Georgia 30334

Dear Ed:

Enclosed please find three copies of this month's progress report. We appreciate your help in dealing with Mr. Hicks from Oak Ridge, and I believe he was satisfied with our progress.

Please call me at 894-3448 if you have any questions.

Sincerely,

William S. Buettner  
Chief, Wood Energy Systems Division

WSB/jb

Enclosures (3)

cc:  J.L. Birchfield  
     G.B. Curtis  
     M.L. Brown  
     J.L. Walsh  
     T.F. McGowan  
     C.L. Aton  
     Photo Lab
PROJECT

Title: A State Demonstration Program in Wood Energy-Phase II

CONTRACT

Number: DE-FG05-79ET23076-A001
Start Date: 4/15/80
Completion Date: 6/30/81
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to accelerate the commercialization of wood energy for nonforest industries in Georgia as a replacement for oil and gas fuels.

2.0 CONTRACT TASKS

Task 1.0 Development of a Wood Energy Extension Service to provide widespread technical assistance to industry and institutions. This assistance will take the form of handbook development, feasibility studies, and implementation assistance.

Task 2.0 This task will involve the continued supervision of the three demonstration projects begun under Phase I.

Task 3.0 In-depth analysis of specific problems in supply, storage, and drying of wood fuels delineated in Phase I as well as better definition of property standards.

Task 4.0 Survey of potential wood gasification applications in Georgia and practical test programs on gasifier operational problems.

Task 5.0 Technology-transfer through seminars, publications, tours of demonstration sites, and presentations of national conferences.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.
4.0 VARIANCES

Task 4.0 Site visits were deferred until October due to the availability of data from previous energy audits. Actual site visits will be done in October.

5.0 SUMMARY STATUS AND FORECAST

Activities for the month centered on the following:

Task 1.0 The work this month consisted of finalizing the selection of feasibility study candidate sites and beginning field trips to sites to collect data. Handbook development is progressing with text written on some sections.

Nineteen feasibility study sites have been selected. These sites are comprised of 3 for electrical cogeneration; 4 for product drying; 2 for space heating and air conditioning, and 10 for process steam.

Five field trips have been made to candidate sites for data collection. The remaining sites will be visited over the next 6 weeks.

Site visits to the Rome gasifier and Merry Brick Company provided good input for the Material Handling chapter of the handbook. The wood fuel drying chapter is close to completion. It features latest data on American manufactured dryers installed in nonforest products industries.

Work continued on preparation of presentation material for the November seminars.

Grant Curtis presented a paper on "Wood for Industrial Energy" at the annual meeting of the Florida Forestry Association.

Task 2.0 Construction on the Integrated Products facility continued during September with the boiler set in place, the boiler house completed, and the silo bucket elevator installed. The sign denoting Integrated Products as a demonstration site was installed. Georgia Tech assisted in the evaluation of potential fuel delivery options. An economic analysis on the feasibility of purchasing wood trailers was completed.
A trip was made to the Valdosta area to identify potential fuel suppliers for Gold Kist. A list of potential suppliers was compiled and presented to Gold Kist management. Personnel from Georgia Tech and Gold Kist met with the boiler supplier's representatives to discuss design details. Georgia Tech also became involved in evaluating potential emission control systems.

Work continued on identifying the final demonstration site. Another company, Oil-Dri Corporation, expressed interest in being considered as a candidate. A presentation on wood as a fuel was made to Oil-Dri management on September 8 in Chicago. As of late September, little progress in reaching an agreement had been made. The major stumbling block was the uncertainty concerning possible product degradation during direct drying with wood. The J.P. Stevens Co. in Dublin remained a viable contender. Five companies visited Stevens in September to prepare bids on boiler conversion costs. Georgia Tech identified a potential wood supply for Stevens during this month also.

Task 3.0 Detailed investigations of wood fuel supplies were continued. The objective of the subtask is to develop a county-by-county map of the state showing available fuel and current fuel consumption. Data from this effort is being coordinated with Task 1.0 work to develop a common data base.

We are currently in the process of obtaining membership on American Society for Testing and Materials (ASTM) Subcommittee E44.12 on Biomass Conversion Systems. Draft copies of the standards have been obtained from the subcommittee chairman at North Carolina State University. A test program is being developed for verification of these standards.

Sites for analysis of storage effects on wood fuels are being identified. The current plan is to utilize the demonstration sites as well as other operating wood fuel installations in the state.

Data on drying equipment and systems are being collected. Operating installations are being identified for future site visits.

Task 4.0 An engineer with background in gasification and contacts with the textile industry returned from a foreign assignment. He is presently reviewing data collected to date, project goals, and budgets for the survey portion of this task. No site visits
were made in September since data was available from previous energy audits. Actual site visits will be done in October.

A trial run of the Georgia Tech gasifier was scheduled for September 30th, but postponed due to rain until October 2. This trial run will be used to test changes in the infeed level detection system (using instrumentation on loan) before ordering level detectors made to our specifications.

Tests were run on a textile drying oven, heated electrically to ascertain the heat required from the gasifier to dry and cure textiles with wood gas. The feed tank has been redesigned for higher capacity, and a furnace designed for sampling the combusted wood gas which will heat the textile oven.

The piping and instrumentation system has also been designed. Specifications will be finalized and parts and supplies ordered in the next 2 months.

Task 5.0 Work is continuing on the seminar entitled, "Case Studies in Wood Energy" to be held November 5 in Atlanta and November 25 in Savannah. News releases were sent to 150 trade magazines and 350 Georgia newspapers. Announcement brochures were sent to 1500 companies and government agencies as well as to hospital, nursing home, and school physical plant directors in Georgia. Copies of each are attached.

Articles for the first newsletter are currently being collected. Topics to be covered will include gasification and pyrolysis as well as the tasks being conducted under this project.

An agreement has been reached with Southern Solar to work jointly on the economic analysis program. They will contract with a financial consulting firm to verify our proposed analysis and to prepare a camera-ready brochure explaining the economic indices used. Georgia Tech will perform the computer coding and provide Southern Solar with a working copy of the software.
Design of the scale model is currently being conducted. The model will be a typical textile mill and include wood storage, an HRT boiler, and a wood unloading system.

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources

Attachments:

- Milestone Plan and Management Report
- News Release (2)
- Brochures (2)
## MILESTONE PLAN AND MANAGEMENT REPORT

**A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- PHASE II, Task 1**

**Georgia Office of Energy Resources**
270 Washington Street, S.W.

**Atlanta, Georgia 30334**

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<td>1.4 Implementation Assistance</td>
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<td>1.5 Final Report</td>
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A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 2

Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

DE-FC05-79ET23076 A001

April 15, 1980
June 30, 1981

Select Demonstration Site
Conceptual Designs
Contract Document Prep
Assist in Contractor Selection
(Site Visits)
Monitor Performance
Analysis & Reporting
Disseminate Results

FY80
FY81
J  A  S  O  N  D  J  F  M  A  M  J

Complete
# A State Demonstration Program in Wood Energy -- Phase II, Task 3

**Georgia Office of Energy Resources**  
270 Washington Street, S.W.  
Atlanta, Georgia 30334

**DE-FC05-79ET23076 A001**  
April 15, 1980  
June 30, 1981

## Milestone Plan and Management Report

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<td>Interim Reports</td>
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## Remarks

**Contract Manager** and **Date**

**Signature of Contractor's Project Manager and Date**

**Signature of Government Technical Representative and Date**
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**MILESTONE PLAN AND MANAGEMENT REPORT**

**A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 5**

**Contractor Identification**
Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

**Contractor Name and Address**

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**Contract Number**
DE-FG05-79ET23076 A001

**Contractor Completion Date**
June 30, 1981

**Report Period**
April 15, 1980

**Sponsor's Contract Number**
414-0-8001016

**Sponsor's Contract Form**
414-0-8001016

**Sponsor's Contract Completion Date**
June 30, 1981

**Sponsor's Contract Completion Date**
June 30, 1981

**Sponsor's Contract Completion Date**
June 30, 1981
December 15, 1980

Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington Street, S.W.  
Atlanta, Georgia 30334

Dear Ed:

Enclosed please find three copies of this month's progress report. We are pleased to report that the Integrated Products plant is currently undergoing startup. I think a "ribbon cutting" is in order after the first of the year. Please give me your thoughts on this. We are also proceeding quite well on the Gold Kist project, but we are still having problems in securing the final demonstration candidate.

Please call me if you have any questions.

Sincerely,

William S. Bulpitt, Chief  
Wood Energy Systems Division

WSB/jb

Enclosures (3)

cc: J.L. Birchfield  
G.B. Curtis  
M.L. Brown  
J.L. Walsh  
T.F. McGowan  
C.L. Aton  
Photo Lab
MONTHLY STATUS REPORT

Date: 12/12/80
Period: 11/01/80 - 11/30/80

PROJECT

Title: A State Demonstration Program in Wood Energy-Phase II

CONTRACT

Number: DE-FG05-79ET23076-A001
Start Date: 4/15/80
Completion Date: 6/30/81
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to accelerate the commercialization of wood energy for nonforest industries in Georgia as a replacement for oil and gas fuels.

2.0 CONTRACT TASKS

Task 1.0 Development of a Wood Energy Extension Service to provide widespread technical assistance to industry and institutions. This assistance will take the form of handbook development, feasibility studies, and implementation assistance.

Task 2.0 This task will involve the continued supervision of the three demonstration projects begun under Phase I.

Task 3.0 In-depth analysis of specific problems in supply, storage, and drying of wood fuels delineated in Phase I as well as better definition of property standards.

Task 4.0 Survey of potential wood gasification applications in Georgia and practical test programs on gasifier operational problems.

Task 5.0 Technology-transfer through seminars, publications, tours of demonstration sites, and presentations of national conferences.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.
4.0 VARIANCES

Task 2.0 Selection of the final demonstration site set for October was still not made during November. It is anticipated that a decision will be made in December on how to proceed and a work plan change will be finalized in January.

5.0 SUMMARY STATUS AND FORECAST

Activities for the month centered on the following:

Task 1.0 Visits to feasibility study sites were completed this month. Four of the original twenty candidates have asked for a postponement in studying their facilities for various reasons. Presently data has been collected at sixteen sites and it is anticipated that the remaining four candidates will reactivate their interest before the end of the first quarter of 1981.

Wood supply data for each site is being tabulated from previous state surveys. An up-to-date waste material survey should be available to complete the supply studies in the next 6-8 weeks. Currently, the supply data for the sites is approximately 25% completed.

Written text is underway on the first two studies. Those formats will be used for the remaining studies. Efforts are underway to update capital costs and operational costs.

During December, the handbook has been formulated into three sections. Section I enables the plant engineer to perform an in-house feasibility study. Material covered includes feasibility study methodology, cost factors, fuel supply, equipment and brief process descriptions.

Section II is an encyclopedic treatment of wood burning technology, cogeneration, pertinent environmental and OSHA information and material handling. Chapters are written by authors within the WESD group.

Section III lists available resources. Equipment vendors, known sources of fuel supply—producers of whole green tree chips and mills producing wood residues; wood brokers; and foresters known to be involved in fuel energy supply to nonforest products industries are listed herein.

The handbook scale is now established for boilers in the 20,000 to 60,000 lb/hr steam. In this way, efforts of other handbooks are not being duplicated.
Task 2.0 The construction of the wood system at Integrated Products was completed during the third week of November and testing of the components was started. Hydraulic testing of the boiler tubes was performed. Commitments for the wood fuel supply have been secured. Currently fuel is being procured in a company-owned truck and stored in the silo.

The foundations for the Gold Kist installation were largely completed in November. A wet scrubber emission system was selected as the most feasible and specification on such a system begun.

J.P. Stevens Company was removed from consideration when they learned capital funds for a wood energy system were not available. No decision has been made as yet on how to proceed in selecting the final site.

Task 3.0 The cover letter and questionnaire for the statewide mail survey have been completed. A list of approximately 500 potential suppliers to whom questionnaires will be mailed has been generated. The mailing is planned for the first part of January.

A meeting with Mr. Doug Adams of the Burlington Industries plant at Rabun Gap was held to tour the plant and discuss wood storage. The wood boiler facility is an extremely well planned and designed system and should be operational by January. Burlington expressed a desire to work with Georgia Tech to develop data on the effects of storage on total pile energy.

Drafts of the detailed test plans for the standards and storage test program have been prepared and are being reviewed. Meetings are planned for the first part of January with the Georgia Forestry Commission and Merry Brick Company to finalize all details for the testing of the control piles.

Data for testing methods for Refuse Derived Fuels has been obtained from the American Society for Testing and Materials. These standards provide details for determination of carbon, sulphur, and ash content and the gross caloric value of fuels. These standards will be complemented on the test program.
Task 4.0 We have located a textile manufacturer in Cartersville, Georgia, who is interested in installing a wood gasifier. The plant has already bought five acres of land for wood storage and installation of the gasifier. This plant will offer an excellent opportunity to analyze space requirements, energy use, and plant physical constraints. Approximately 6 other textile mills will be visited for comparison purposes.

A questionnaire has been prepared and mailed out to approximately 20 vendors of low-Btu gas burners. We expect returns of this survey to arrive in mid-December to early January.

Approximately 3 tons of wood pellets were picked up from Tennessee Woodex in Knoxville, Tennessee. This fuel will be used in the textile drying experiments. A technician has been interviewed and will be hired in January to aid in the experimentation. More equipment and supplies have arrived, and assembly may begin ahead of schedule if the technician is available.

Task 5.0 "Case Studies in Wood Energy" was presented in Savannah to an audience of 23 consisting of forest and nonforest products representatives as well as government agencies. A tabulation of the evaluation sheets is attached as well as a copy of the schedule.

Work has begun on a seminar to be given next spring on financial alternatives for wood energy system investors. Southern Solar will be a co-sponsor. Speakers will be from Georgia Tech, the accounting firm of Arthur Andersen, and a local financial institution. Topics to be covered will include an overview of wood energy systems, financial considerations such as taxes, cash flow, and return on investment, equipment financing trends, and key evaluation factors used by lending institutions.

Work is continuing on the computer economics program in cooperation with Southern Solar and Arthur Andersen. A Texas Instruments Model 745 portable teleprinter console with acoustic coupler has been chosen. This program will be explained and demonstrated at the spring seminar.

Work is continuing on the scale model of wood energy system. A Georgia Tech representative was sent to the South Carolina Forestry Association's Annual Meeting. The theme was the use of wood as a fuel. The conference was valuable in providing an insight into the developments, expectations, and attitudes of potential wood fuel suppliers.
Ed Bistany, Program Coordinator
Georgia Office of Energy Resources

Attachments:

- Milestone Plan and Management Report
- Seminar Schedule
- Evaluation Sheets
### A State Demonstration Program in Wood Energy -- Phase II, Task 5

**Project Title:** Milestone Plan and Management Report

**Contracting Office:**
Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

**Contract Number:** DE-FG05-79ET23076 A001

**Contract Start Date:** April 15, 1980
**Contract Completion Date:** June 30, 1981

**Fiscal Year Period:** November 1 through November 30

**Milestones:****

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**Notes:**

- △ Indicates milestone was met or exceeded.
- □ Indicates milestone was not met or was exceeded.

**Seminars and Tours**

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  - D: □

- **FY81:**
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**Publications Development**

- **FY80:**
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  - M: △
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  - M: △
  - J: △
**MILESTONE PLAN AND MANAGEMENT REPORT**

**A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY — Phase II, Task 4**

**Georgia Office of Energy Resources**

270 Washington Street, S.W.

Atlanta, Georgia 30334

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**DE-FC05-79ET23076 A001**

**Contract Duration**

April 15, 1980 — June 30, 1981

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**Signatures**

**Signature of Contractor Project Manager and Date**

**Signature of Government Technical Representative and Date**
A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY — Phase II, Task 3

Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

| 3.1  | Supply & Processing Network |
| 3.2  | Availability & Costs       |
| 3.3  | Standards                  |
| 3.4  | Storage                    |
| 3.5  | Drying                     |
| 3.6  | Interim Reports            |

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- April 15, 1980
- June 30, 1981
## Milestone Plan and Management Report

**A State Demonstration Program in Wood Energy -- Phase II, Task 2**

**Contractor Name Address:**
Georgia Office of Energy Resources  
270 Washington Street, S.W.  
Atlanta, Georgia 30313

**Contract Start Date:** April 15, 1980  
**Contract Completion Date:** June 30, 1981

**DE-FC05-79ET23076 A001**

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**Signatures:**
- Signature of Contractor Project Manager and Date
- Signature of Government Technical Representative and Date
A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- PHASE II, Task 1

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Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30312

DE-FG05-79ER23076 A001

November 1 through November 30
April 15, 1980

June 30, 1981
Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington Street, S.W.  
Atlanta, Georgia 30334

Dear Ed:

Three copies of December's monthly progress report are attached.

The wood-fired boiler plant at Integrated Products in Aragon, Georgia, is now on stream and working smoothly. Our Technology Transfer Division is organizing a "ribbon cutting" for it, tentatively scheduled for February 5, 1981.

I'm pleased to report that all four volumes summarizing last year's work are at the printers and should be finished before the end of January.

Sincerely,

William S. Burditt, Chief  
Wood Energy Systems Division

WSB/jb

Enclosures

cc: J.L. Birchfield  
G.B. Curtis  
M.L. Brown  
J.L. Walsh  
T.F. McGowan  
C.L. Aton  
Photo Lab
MONTHLY STATUS REPORT

Date: 1/14/81
Period: 12/01/80 to 12/31/80

PROJECT:

Title: A State Demonstration Program in Wood Energy-Phase II

CONTRACT

Number: DE-FG05-79ET23076-A001
Start Date: 4/15/80
Completion Date: 6/30/81
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30332

1.0 CONTRACT OBJECTIVE

The objective of this report is to accelerate the commercialization of wood energy for nonforest industries in Georgia as a replacement for oil and gas fuels.

2.0 CONTRACT TASKS

Task 1.0 Development of a Wood Energy Extension Service to provide widespread technical assistance to industry and institutions. This assistance will take the form of handbook development, feasibility studies, and implementation assistance.

Task 2.0 This task will involve the continued supervision of the three demonstration projects begun under Phase I.

Task 3.0 In-depth analysis of specific problems in supply, storage, and drying of wood fuels delineated in Phase I as well as better definition of property standards.

Task 4.0 Survey of potential wood gasification applications in Georgia and practical test programs on gasifier operational problems.

Task 5.0 Technology-transfer through seminars, publications, tours or demonstration sites, and presentations of national conferences.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.
4.0 **VARIANCES**

None to report during this period.

5.0 **SUMMARY STATUS AND FORECAST**

Activities for the month centered on the following:

**Task 1.0** Continued effort has been concentrated in updating the data base for wood fuel supply and equipment costs throughout the month of December. The data base should be complete in January. Some additional wood residue information will be available later this spring, and will be incorporated into the final presentations.

The system review and energy requirements for each feasibility site was completed in December, and with the completion of data base updates, full scale writing for each study can begin in the next weeks with a major portion of time being devoted to economic analysis.

Technical assistance was provided for eight companies this month. Five of the companies were considering wood as a fuel and three companies were interested in supplying wood fuels.

**Task 2.0** The wood boiler at Integrated Products was first, started up on December 8 and run off-and-on for several days for de-bugging. On December 18 during the de-bugging process, a feedwater pump failed and further work was postponed until January.

At Gold Kist, the foundations and both concrete silos have been completed. Bids on a sign denoting the plant as a wood energy demonstration site were solicited during December. Personnel from Wellons, the boiler manufacturer, are expected to begin preparation for the actual boiler installation in January.

With J.P. Stevens out of the picture as a demonstration site, attention turned toward other candidate sites. Stevens was the last of the fourteen original feasibility study recipients to be considered for a demonstration system. In December, firms who expressed interest in serving as a demonstration site but did not receive a feasibility study during the first year were interviewed. An alcohol project headed by the Southeast Georgia Area Planning and Development Commission (APDC) in Douglas, Georgia, was one such candidate considered. This organization proposed to use a wood boiler to supply steam for distilling and grain drying operations. Their proposal was eventually
rejected because of the large amount of Government financing already made available to this project. Wrigley's Company of Gainesville, Georgia, who had dropped out of competition as a demonstration site during the first quarter of 1980, again showed renewed interest. Tech personnel agreed to meet with Wrigley's at their convenience. Finally, engineers from the Graniteville Company, located in Augusta, Georgia, heard of the possibility of becoming a demonstration site at a wood energy seminar sponsored by Georgia Tech. After preliminary discussions, a visit was made to Augusta by Tech personnel on December 18. It was agreed that the plant has merit as a demonstration site and further study was outlined.

Task 3.0 The first 50 mail survey packages have been assembled and mailed. The remaining 400 packages will be mailed during the first week in January. A copy of the letter and questionnaire included in the package is attached.

The initial drafts of the detailed storage test plans have been reviewed, and the revised drafts are being prepared. Final review will take place in January.

Drafts of material requisitions for all testing equipment are currently being prepared. Final review and submission to purchasing will be accomplished in January.

Mr. James Walsh, Task 3 Director, has become a member of the American Society for Testing and Materials Subcommittee E44.12 for Biomass Fuels. He will support the subcommittee's activities in the development of wood fuel standards.

Task 4.0 The in-depth interviews with six textile manufacturers have been completed. These included assessing plant layout, space allocation for wood fuel storage, and major fuel consuming equipment specifications. In addition, 4 textile companies were contacted by phone and surveyed on their energy use and interest in conversion of existing combustion equipment via gasification.

Six companies have responded to our detailed questionnaire on low-Btu gas burners. These responses will be evaluated and written up in January.

Instrumentation was received for the gasifier this month, consisting of high temperature radio frequency level detectors as well as high temperature duct insulation.

A technician was interviewed this month and will start work in January on fabricating the test system for textile drying.
Task 5.0 The ribbon-cutting ceremony at Integrated Products in Aragon, Georgia, will be held on February 5, 1981. The Research Public Relations Office of the Engineering Experiment Station will assist with press releases, press conferences, and layout for the handout at the ceremony.

The "Wood Energy Financing" workshop, has been scheduled for the morning of April 29, 1981. The date was chosen to permit advertising the workshop at the FPRS meetings and the North Carolina State meetings that precede it. A finalized agenda has been developed after discussion with the four participating institutions:

- Georgia Tech (Carol Aton, Head, Technology Transfer Branch; Edward Jacobson, Economist) will cover wood energy technology and economics.

- SSEC (Dave Gustashaw or a member of the public relations staff) will describe their wood energy program.

- Arthur Andersen & Co. (Don Lewis, associate) will discuss cash flow, tax considerations, and other financial aspects.

- First National Bank of Atlanta (Mike Whitmire, VP, Head of Commercial Finance) will cover credit criteria and sources of funding.

Brochures will be sent out in February to mailing lists that are being developed for the workshop from existing wood energy mailing lists and from rosters of financial institutions and consultants. News releases will be sent at the same time to the media and to professional organizations.

The computer program for wood energy economic analysis can now calculate capital costs of a wood-fired system. The program is substantively complete, lacking only format modifications. The program is being prepared for demonstration at the April workshop. During February we will be writing a user's manual and a paper explaining the program, its inputs, outputs, and methodology. We expect to submit it to journals and organizations that will disseminate it.

The scale model is now complete through the board building phase. The board is stained, and the construction of the miniature textile mill has started.

Attachments:
- Milestone Plan and Management Report
- Mail Survey

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources
<table>
<thead>
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<th>Milestone</th>
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<td>1.5  Final Report</td>
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**Remarks**

**Contractor Name and Address**

Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

**Prime Contractor**

DE-FG05-79ET23076.A001

**Contract Start Date**

April 15, 1980

**Contract Completion Date**

June 30, 1981
**MILESTONE PLAN AND MANAGEMENT REPORT**

**A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 2**

**Georgia Office of Energy Resources**  
270 Washington Street, S.W.  
Atlanta, Georgia 30313

**DE-FG05-79ET23076 A001**

**Contract Number:** DE-FG05-79ET23076 A001  
**Contract Start Date:** April 15, 1980  
**Contract Completion Date:** June 30, 1981

**Fiscal Years and Months**

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**Remarks**

**1.1** Signature of Contractor Project Manager and Date:  
**1.2** Signature of Government Technical Representative and Date:
# Milestone Plan and Management Report

**A State Demonstration Program in Wood Energy -- Phase II, Task 3**

**Contractor:**

- **Georgia Office of Energy Resources**
  - 270 Washington Street, S.W.
  - Atlanta, Georgia 30334

**Contract Number:**

- DE-FG05-79ET23076 A001

**Reporting Period:**

- December 1 through December 31

**Contract Start Date:**

- April 15, 1980

**Contract Completion Date:**

- June 30, 1981

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**Fiscal Years and Months:**

- JAN FEB MAR APR MAY JUN JUL AUG Sep OCT Nov DEC

**Percentage Complete:**

- ▲ indicates at least 50% complete
- ▼ indicates less than 50% complete

**Reference:**

- [Contractor's Project Manager and Date]

**Governmental Technical Representative and Date:**

- [Contractor's Project Manager and Date]
A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 4

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Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

Contract Completion Date
June 30, 1981
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<td>Scale Model</td>
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<td>Computer Analysis</td>
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</tbody>
</table>
Mr. M. E. Garrison  
Garrison and Sons  
Box 15  
Homer, Georgia 30547  

Dear Mr. Garrison:

As you may know there has been a tremendous increase in interest in mill residue as a boiler fuel during the past year.

Georgia Tech is currently doing studies around the Georgia Office of Energy Resources to determine the feasibility of using wood-fired boiler installations in manufacturing facilities. As a part of these studies it is necessary to determine what percentage of the wood fuel supply would be mill residue (bark, sawdust, chips) and what percentage would be whole tree chips.

We know that it is difficult for you to determine how much residue you produce but it may become very important for you to have some idea of how much you could supply as fuel. If you are currently dumping or burning the residue, this may be an opportunity for you to get into the business of becoming a supplier to the proposed industries.

We can use your data input in one of two ways. We can name you as having the potential of supplying a certain amount of residue in the county or you can remain unnamed and we'll put you in as a county source. In this latter case we will not refer to you by name in any report or publication.

The enclosed sheet has questions which we would like for you to answer as best you can and return before December 31, 1980.

Sincerely,

R. Dale Atkins, P.E.  
Research Engineer

RDA:pw  
Enclosure
Mr. M. E. Garrison  
Garrison and Sons  
Box 15  
Homer, Georgia 30547

Years in business at this location _______  Number of employees ___  
Responding Person ______________________ Title ______________________  
Nature of Business (Lumber Co., Sawmill, Veneer, Pallet, etc.) ____________________________________________  

Volume of Business (tons per day, board feet of lumber, etc.) ____________________________________________  

Is Wood Waste Used for Fuel Here?  Yes ____ No ____  
If used, how?  
Boiler: Yes ____  
Electrical Generation: Yes ____  
Drier: Yes ____  
Other (Describe) ____________________________________________  

Is wood waste available to sell?  Yes ____ No ____  
Are you currently selling wood waste?  Yes ____ No ____  
What % of production is available for sale currently? _______  
In what form is it available: 

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<th></th>
<th>How much (tons/day)</th>
<th>Price/ton (if sold)</th>
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<tr>
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<td>Sawdust</td>
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<td>Chips</td>
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<tr>
<td>Shavings</td>
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</table>

Is the price given delivered?  Yes ____ No ____  
Do you want to be identified as a specific source of mill residue in our publications?  
Yes ____ No ____  
May Georgia Tech visit this location?  Yes ____ No ____  
Whom should we contact for a plant visit? ____________________________________________  
Your cooperation is appreciated.  
Please put in the self-addressed stamped envelope and return.
Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington Street, S.W./Room 615  
Atlanta, GA 30334

Dear Ed:

Enclosed is our monthly report on project A-2400 for January. As you know, we have been quite busy on matters related to this project recently, and I feel that our "ribbon burning" in Aragon and the project review in Washington last week went quite well.

If you have any questions about this report or any other aspect of the project, please call me at 894-3448.

Sincerely,

William S. Bulpitt, Chief  
Wood Energy Systems Division

WSB/jb

Enclosures

cc: J.L. Birchfield  
R.S. Combes  
M.L. Brown  
G.B. Curtis  
J.L. Walsh  
T.F. McGowan  
C.L. Aton
MONTHLY STATUS REPORT

Date: 2/17/81
Period: 1/01/81 to 1/31/81

PROJECT:

Title: A State Demonstration Program in Wood Energy-Phase II

CONTRACT

Number: DE-FG05-79ET23076-A001
Start Date: 4/15/80
Completion Date: 6/30/81
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to accelerate the commercialization of wood energy for nonforest industries in Georgia as a replacement for oil and gas fuels.

2.0 CONTRACT TASKS

Task 1.0 Development of a Wood Energy Extension Service to provide widespread technical assistance to industry and institutions. This assistance will take the form of handbook development, feasibility studies, and implementation assistance.

Task 2.0 This task will involve the continued supervision of the three demonstration projects begun under Phase I.

Task 3.0 In-depth analysis of specific problems in supply, storage, and drying of wood fuels delineated in Phase I as well as better definition of property standards.

Task 4.0 Survey of potential wood gasification applications in Georgia and practical test programs on gasifier operational problems.

Task 5.0 Technology-transfer through seminars, publications, tours or demonstration sites, and presentations of national conferences.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

None to report during this period.
5.0 SUMMARY STATUS AND FORECAST

Activities for the month centered on the following:

Task 1.0 For the feasibility studies, the bulk of this month's effort was devoted to the development of a computerized economic life cycle analysis for the candidate industries. This program will allow the rapid generation of profitability and payback information taken into consideration tax credits, depreciation allowances, tax rates, current fuel costs, etc. A further advantage is the rapid generation of sensitivity tables for any of the input variables. This will allow a study recipient to see the changes in profitability of wood conversion as changes are expected in gas and oil prices, wood costs, etc. It also allows the development of levels of confidence by varying estimated items such as equipment costs.

The text of the first study is in the editing stages and with the completion of the computer program, should be finalized in the very near future.


Task 2.0 During the month of January, the wood boiler at Integrated Products became fully operational. It is now supplying all the steam for process heat. Preparations for the February 5 dedication are being finalized.

At Gold Kist, construction on the boiler began in earnest. Progress was made on building the grates and firebox and wiring on the control room was started. Bids for a sign at the site were solicited and a decision on a supplier is expected in February.

Georgia Tech personnel continued to work on a feasibility for Graniteville. Information on wood fuel supply was collected by telephone. A meeting with Industrial Boiler Company was held to discuss budget prices to serve as the basis of the economic analysis. The date for the formal presentation of the study results were set for February 4.
Task 3.0  Approximately 200 mail surveys of the 450 shipped have been returned. The preliminary results of the survey are being compiled and should be available shortly.

The laboratory for the storage and standards testing program is about 60% complete. Some equipment has been received and the balance is expected in February. Preliminary testing will be initiated as soon as the lab is completed.

Mr. J.L. Walsh attended the quarterly meeting of ASTM SubCommittee E44.12 for Biomass Fuels in Charleston, SC on January 13 and 14. All four of the subcommittees draft specifications were reviewed, and all require extensive rework. Georgia Tech is responsible for revising the procedure for determining volatile content in wood fuels.

Task 4.0  All surveys of the textile industry have been completed. Additional data has been compiled on the number of potential gasifier users in the textile industry by using standard industrial code testing for Alabama, South Carolina, and Florida. Cost data is being assembled for gasifier systems and report writing has commenced.

A final draft of the survey of low-Btu gas burners has been completed. This draft should be in final form in January when artwork and editing are finished.

A laboratory space is being renovated for calorimetry testing to support the gasifier textile dyeing experiments. A large feed tank for the gasifier has arrived from the fabricator as well as valve controllers. Alteration of the gasifier's auxiliaries will continue in February.

Task 5.0  The computer program for evaluating the economics of wood fuel conversion is now operational. Work this month centered on preparing a promotional brochure in conjunction with Arthur Andersen and Southern Solar. The brochure explains how the program works using a specific example from the feasibility studies. A sample output sheet is attached.

Work is continuing on "Wood Energy Financing" to be held on April 29 in Atlanta. A copy of the news release is attached.
Work is also continuing on the scale model. The textile mill is complete, and truck dump construction has begun.

The ribbon was burned with a torch ignited in the new wood boiler as the formal dedication at Integrated Products, Inc., in Aragon, Georgia began. Over 100 people attended the ceremony to inspect the new 400 hp system and listen to addresses by Dr. Beverly Berger, Director of the Biomass Energy Systems Division of the Department of Energy; Mark Zwecker, Director of the Georgia Office of Energy Resources; and Hardin Byars, Vice President of Engineering and Development.

The dedication was well received by the media as well as the guests in attendance. Local ABC and NBC-TV affiliates as well as many radio stations covered the event and a half-page story appeared in the February 9 edition of the nationally distributed newspaper Energy User News.

A brochure prepared for the dedication is attached.

---

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources

Attachments:

- Milestone Plan and Management Report
- News Release
- Computer Output
- Dedication Brochure
# Milestone Plan and Management Report

## Project: A State Demonstration Program in Wood Energy — Phase II, Task 1

### 1. Description

- **Project Title:** Georgia Office of Energy Resources
- **Address:** 270 Washington Street, S.W.
- **City:** Atlanta, Georgia 30314

### 2. Milestones

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<th>Function</th>
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<tr>
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<td>1.3 Handbook Development</td>
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<td>1.5 Final Report</td>
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### 3. Milestone Status

- **Final Report:**
  - **Due Date:** June 30, 1981
- **Contract Start Date:** April 15, 1980
- **Contract Number:** DE-FG05-79ET23076-A001

### 4. Notes

- **Purpose:**
  - Selection of Feasibility Study Candidates
  - Study Preparation
  - Handbook Development
  - Implementation Assistance
  - Final Report

### 5. Signatures

- **GEOMEN, Project Manager and Date:**
- **Prime Contract:**
  - **Prime Contract:**
  - **Prime Contract:**
  - **Prime Contract:**
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| Signatures of Contracts Project Manager and Date | 1.2 In addition, the Contractors Technical Representatives and Date |

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| Completion Date: June 30, 1981 |
### A State Demonstration Program in Wood Energy -- Phase II, Task 3

**Georgia Office of Energy Resources**
270 Washington Street, S.W.
Atlanta, Georgia 30334

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**Program Period:**
April 15, 1980 through June 30, 1981
## MILESTONE PLAN AND MANAGEMENT REPORT

### A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 4

**Georgia Office of Energy Resources**

270 Washington Street, S.W.

Atlanta, Georgia 30334

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<td>4.7 System Assembly</td>
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<td>4.8 Perform Tests</td>
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<td>4.9 Write Report</td>
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</tbody>
</table>
### Milestone Plan and Management Report

**A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 5**

**Georgia Office of Energy Resources**
270 Washington Street, S.W.
Atlanta, Georgia 30334

<table>
<thead>
<tr>
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<tr>
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<td>5.4 Computer Analysis</td>
<td><img src="image" alt="Computer Analysis Progress" /></td>
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</tbody>
</table>

**Project Duration:**
- **April 15, 1980**
- **June 30, 1981**
Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington Street, S.W./Room 615  
Atlanta, GA 30334  

Dear Ed:  

Enclosed please find three copies of this month's progress report on project A-2400. As you know, it has been decided that a third demonstration plant will not be funded under the project, but that the funds will be used to redirect our research efforts.  

I made a trip to the Valdosta Gold Kist plant last week, and it is progressing quite well. The Integrated Products Plant is very happy with its installation and have been very thankful for our help in the project.  

If you have any questions about this report, please call me at 894-3448.  

Sincerely,  

William S. Bulpit, Chief  
Wood Energy Systems Division  

WSB/jb  

Enclosures (3)  

cc:  J.L. Birchfield  
     R.S. Combes  
     M.L. Brown  
     G.B. Curtis  
     B.S. Dixit  
     T.F. McGowan  
     C.L. Aton  
     Photo Lab  

AN EQUAL EMPLOYMENT/EDUCATION OPPORTUNITY INSTITUTION
MONTHLY STATUS REPORT

Date: 3/17/81
Period: 2/01/81 to 2/28/81

PROJECT:

Title: A State Demonstration Program in Wood Energy-Phase II

CONTRACT

Number: DE-FG05-79ET23076-A001
Start Date: 4/15/80
Completion Date: 6/30/81
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to accelerate the commercialization of wood energy for nonforest industries in Georgia as a replacement for oil and gas fuels.

2.0 CONTRACT TASKS

Task 1.0 Development of a Wood Energy Extension Service to provide widespread technical assistance to industry and institutions. This assistance will take the form of handbook development, feasibility studies, and implementation assistance.

Task 2.0 This task will involve the continued supervision of the three demonstration projects begun under Phase I.

Task 3.0 In-depth analysis of specific problems in supply, storage, and drying of wood fuels delineated in Phase I as well as better definition of property standards.

Task 4.0 Survey of potential wood gasification applications in Georgia and practical test programs on gasifier operational problems.

Task 5.0 Technology-transfer through seminars, publications, tours or demonstration sites, and presentations of national conferences.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

None to report during this period.
5.0 SUMMARY STATUS AND FORECAST

Activities for the month centered on the following:

Task 1.0 A final draft of the first feasibility study was completed in February and a copy sent to the company. All supply studies have been completed and categorized for the 19 locations. Work is underway on the reports for cogeneration, mineral drying, and institutional space heating applications. These reports will be generated simultaneously along with the remaining process heat and steam applications. Additional manpower support has been secured to aid in the output and printing of the final reports.

The following chapters of the handbook are now in draft form—recorded on the word processor—and are being edited and proofed: Storage and Handling, Emissions, Combustion Equipment, Combustion Theory, Wood Fuel Processing Network. Figures and tables for the preceding have been selected and are presently being drafted in ink for reproduction. Collaboration of figures and text will begin shortly.

The chapters, Feasibility Study Methodology and Economic Analysis (using computer simulation) Demonstration Projects, Cogeneration are in draft form not yet recorded on the word processor.

The chapters—Safety and Environmental Considerations, System Costs, Determining Wood Fuel Supply, are in production. Participating chapter authors are Steve Drucker, Robert Didocha, William Nolte, Mike Brown, Grant Curtis, and Dale Atkins.

Task 2.0 The wood energy system at Integrated Products continues to operate normally. Monitoring of the system began in earnest during February. A ribbon burning ceremony was held in Aragon on February 5. Measurements of boiler emissions were conducted and fuel samples were collected for lab analysis. A letter of thanks from Integrated Products is attached.

Construction on the Gold Kist System in Valdosta continues on schedule. The boiler fans, economizer, air preheater, and multi-clone are now in place. Progress is also being made on the fuel feeding system with conveyors from the dump pit to the silos and from the silos to the metering bins being installed.

During February, the Graniteville Company verbally agreed to become the third demonstration site. However, because
of the current budget and future uncertainties it was decided not to pursue this activity. Instead, the cost sharing portion of the budget will be applied to other wood research activities and two demonstration units will be installed.

Task 3.0 The results of the wood residue survey have been tabulated. This survey was sent out to 368 wood products companies across the state of Georgia during January 1981. These companies were in SIC Code 2421 as determined by the Manufacturers Directory. There were 145 companies that responded. This is a response of over 40%.

This survey is probably very conservative. Many of the larger companies whose residue is already under contract did not respond. One of the major problems for a saw-mill operator is determining how much residue that he has, especially if he is not currently selling waste. This survey may only be addressing 30% to 40% of the waste that is available.

In the survey the company was asked if they wished to be listed as a supplier in our publications. If they did not wish to be listed, we took their name and amount off the company list and only included them in the county total. This means that the company listing amount and the county total may not always be the same.

The average delivered price across the state for bark, sawdust, shavings, or slabs is $9/ton and the average price for delivered chips is $17.50/ton. Some additional equipment has been ordered for the fuels testing laboratory. One of these items is a vertical tube furnace specifically designed for the measurement of volatile content in wood. The unit will be used in conjunction with the development of an ASTM standard test method for determination of the volatile content of biomass fuels.

The nuclear density probe has been placed on order. The Georgia Tech license for nuclear testing equipment has been modified to account for the probe. Delivery is expected within a few weeks.

Task 4.0 Cost estimates were assembled for 2 hypothetical gasification systems which could be installed at two of the textile plants covered in the survey. The wood supply for these plants is also being assessed for volume and price. This data will be used to perform an economic analysis for the feasibility of the retrofit of gasification systems.
The report survey of the low-Btu gas burners have been edited and the artwork completed. A final literature search was attempted to find experimental data on producer gas flammability limits. Such data was found and we are adding it to the report. The final copy should be produced at the end of March when this material is incorporated.

Construction is well underway on the alterations to the gasifier plant. The new feed tank, feed system isolation value and level detector are installed and have been tested. Steel work for modifications of the burner section is also underway. Valve controllers and long lead time temperature sensing probes were also received.

Task 5.0 Southern Solar Energy Center has agreed to co-sponsor the conference/trade show to be held in Atlanta in mid-July, Vendors will be contacted in March to fill the 30 spaces provided. A list of speakers and topics for the conference is being formulated. It is anticipated that outside speakers as well as Georgia Tech speakers will be featured.

Announcement brochures were mailed to 2000 potential attendees in Georgia and surrounding states for the Wood Energy Financing Workshop scheduled April 29, 1981. Copies of the brochure are attached. A handout will be published.

The wood energy newsletter is scheduled to be mailed in March. Subsequent newsletters will follow in April and May.

A grand opening tour for the second demonstration plant at Valdosta will be held shortly after startup. Plans are currently being finalized.

Work is continuing on the scale model. It will be set up for display at the April 29 seminar.

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources

Attachments:
- Milestone Plan and Management Report
- Integrated Products Plant Letter
- Announcement Brochures
March 17, 1981

Dr. W. S. Bulpit  
Chief of Wood Energy Systems Division  
Technical Application Lab  
Georgia Institute of Technology  
Engineering Experimental Station  
Atlanta, GA 30332

Dear Bill:

Please accept my apologies for not writing sooner and thanking you for the fine support that you and your department gave us on the wood energy project that we have just completed.

If it had not been for your help on this project, we would continue to be using 51,000,000 cubic feet of natural gas and 56,000 gallons of #2 oil yearly. And as we all know, these fuels are becoming less plentiful and more expensive.

We probably would not have undertaken this project had it not been for the help and funding that came through your office since this was a fairly new concept to our industry.

Let me thank you again for all your help as well as Dr. Dixit's in this project, which we consider extremely successful. We would recommend this approach to other people in our same circumstances.

Very truly yours,

Hardin C. Byars, Vice President  
Engineering and Development

HCB: pmm
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<td>Study Preparation</td>
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<td>Handbook Development</td>
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<td>Implementation Assistance</td>
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<td>1.5</td>
<td>Final Report</td>
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**Notes:**
- Selection of Feasibility Study Candidates:
  - January 1, 1980
- Study Preparation:
  - December 31, 1980
- Handbook Development:
  - December 31, 1980
- Implementation Assistance:
  - December 31, 1980
- Final Report:
  - June 30, 1981
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<td>2.5</td>
<td>Site Visits &amp; Review of Conversions</td>
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<td>2.6</td>
<td>Monitor Performance</td>
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<td>2.7</td>
<td>Analysis &amp; Reporting</td>
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<td>2.8</td>
<td>Disseminate Results</td>
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# A State Demonstration Program in Wood Energy -- Phase II, Task 3

**Georgia Office of Energy Resources**
270 Washington Street, S.W.
Atlanta, Georgia 30334

## Milestone Plan and Management Report

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<td>Interim Reports</td>
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**Reference**: [DE-FC05-79ET23076 A001](#)
## Milestone Plan and Management Report

### A State Demonstration Program in Wood Energy -- Phase II, Task 4

**Georgia Office of Energy Resources**

270 Washington Street, S.W.

Atlanta, Georgia 30334

**April 13, 1980**

**June 30, 1981**

<table>
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<td>4.2 Site Visits</td>
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<td>4.4 Design a Gasifier System</td>
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<td>4.5 Order Mats &amp; Equipment</td>
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<td>4.6 Shipment of Materials &amp; Equipment</td>
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<td>4.7 System Assembly</td>
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<td>4.8 Perform Tests</td>
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<td>4.9 Write Report</td>
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**13. Signature of Sponsor, Technical Monitoring and Date**

DE-FC05-79ET23076 A001
# Milestone Plan and Management Report

**A State Demonstration Program in Wood Energy — Phase II, Task 5**

**Contract Number:** DE-FG05-79ET2076 A001

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<td>5.4</td>
<td>Computer Analysis</td>
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**Signatures:**

12. **Signature of Appropriate Technical Management and Date**
Wood fuel is an exciting old approach to a new
problem. American industry uses huge amounts
of energy, and wood may be the most economical source for many firms. The invest-
ment that would be required has been studied
by the Engineering Experiment Station of
Georgia Tech, the Southern Solar Energy Center
(SSEC), and Arthur Andersen & Co.
An investment in a wood-fired system balances
low fuel costs against high initial capital costs,
with payback periods as low as one year in some
applications. Engineering feasibility studies,
computer models, financial analysis, and
business sense must be combined to make good
investment decisions. In this workshop, the
three agencies above and the First National Bank
of Atlanta will help the executive complement
his own knowledge to be prepared to act wisely.
Georgia Tech has been funded by the U.S.
Department of Energy through the Georgia
Office of Energy Resources to demonstrate the
feasibility of wood energy for industry. Phase I
has been completed, and this workshop is
among many activities that are included in Phase
II.

Workshop Objectives
Participants will learn about evaluation criteria
and investment alternatives for introducing
wood fuel in a firm’s production processes.

Topics Covered
- Introduction to wood fuels — why, when,
  where, who, and how much.
- The economics of wood fuels — does it pay to
  switch?
- Financial considerations — it may be right,
  but can the firm afford it?
- Computer model — a way to save some time
  and effort in the initial decision-making
  phases.
- How to finance — credit evaluation criteria in
  the banking industry, investment options,
  and sources of funds.

Who Should Attend?
The workshop will be valuable for company
executives and planners who will have to make
decisions about investing in wood energy sys-
tems. It will also be important for executives of
financial institutions, industrial consultants, and
personnel from government agencies.

Dates and Location
The workshop will be presented on Wednesday
morning, April 29, 1981, from 8:30 a.m. to 12:30
p.m. It will be held in the Space Science Tech-
nology Building on the Georgia Tech Campus.
The accompanying map shows the building and
the location of parking.

Workshop Fee and Registration
The workshop fee is $10.00 per participant. Pre-
registration will ensure a place in the workshop.
Those who have not pre-registered may register
beginning at 8:00 on the morning of the work-
shop.

Additional Information
Contact Susan Lyrskey at 404-894-3412 or at the
Technology Applications Laboratory
Engineering Experiment Station
Georgia Institute of Technology
Atlanta, GA 30332

Location of the Space Science and Technology Building
on the Georgia Tech campus.
REGISTRATION FORM
Wood Energy Financing

Name ________________________________
Title ________________________________
Organization __________________________
Address ______________________________
City ______ State ______ Zip ______ Phone ______

Make check for $10.00 payable to:
Georgia Institute of Technology

Mail Check and This Form to:
Department of Continuing Education
Georgia Institute of Technology
Atlanta, GA 30332

Wood Energy Systems Branch
Engineering Experiment Station
Georgia Tech
Atlanta, Georgia 30332

WOOD ENERGY FINANCING

April 29, 1981
Atlanta, Georgia

U.S. Department of Energy

Sponsored by
Georgia Office of Energy Resources

Conducted by
Engineering Experiment Station

Georgia Institute of Technology
Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington St., S.W./Room 615  
Atlanta, GA  30334

Dear Ed:  

Enclosed please find three copies of this month's progress report on Project A-2400. We are in the process of redirecting the funds for our third demonstration plant to other hardware related activities. It is expected that a request for amendment will be submitted to you and DOE before the end of April.

We expect the Gold Kist plant to be starting up shortly and will be notifying you of that event.

If you have any questions about this report, please call me at 894-3448.

Sincerely,

William S. Bulpitt, Chief  
Wood Energy Systems Division

WSB/jb

Enclosures (3)

cc:  J.L. Birchfield  
R.S. Combes  
M.L. Brown  
G.B. Curtis  
B.S. Dixit  
T.F. McGowan  
C.L. Aton  
Photo Lab
MONTHLY STATUS REPORT

Date: 4/16/81
Period: 3/01/81 to 3/31/81

PROJECT

Title: A State Demonstration Program in Wood Energy-Phase II

CONTRACT

Number: DE-FG05-79ET23076-A001
Start Date: 4/15/80
Completion Date: 6/30/81
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to accelerate the commercialization of wood energy for nonforest industries in Georgia as a replacement for oil and gas fuels.

2.0 CONTRACT TASKS

Task 1.0 Development of a Wood Energy Extension Service to provide widespread technical assistance to industry and institutions. This assistance will take the form of handbook development, feasibility studies, and implementation assistance.

Task 2.0 This task will involve the continued supervision of the three demonstration projects begun under Phase I.

Task 3.0 In-depth analysis of specific problems in supply, storage, and drying of wood fuels delineated in Phase I as well as better definition of property standards.

Task 4.0 Survey of potential wood gasification applications in Georgia and practical test programs on gasifier operational problems.

Task 5.0 Technology-transfer through seminars, publications, tours or demonstration sites, and presentations of national conferences.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

Changes to the work plan in lieu of a third demonstration are being finalized.

4.0 VARIANCES

None to report during this period.
5.0 SUMMARY STATUS AND FORECAST

Activities for the month centered on the following:

Task 1.0 Final report preparations are on-going for 7 of the 19 studies. Three reports were completed in March. The wood survey reports have been compiled for each of the 19 sites and tables made for the reports.

Printing of the appendices has been completed. The remaining studies should be completed by mid-May and assembly of the overview data for the final report will begin at that time.

Drafting time has been allocated for figures and drawing for the studies, and many of the figures have been completed.

A paper describing the economic analysis procedures has been completed for the handbook.

The text of all chapters for the Handbook exist in draft form. During the next 30 days, appendices will be assembled, a glossary compiled, and formatting of the text finalized. Chapter Review by members of the Wood Division has commenced and is on-going. Inking of drawings is proceeding. It is anticipated that on or about May 25 the assembled handbook will be given to the printer, from whence 3 weeks time will be necessary for final production of the book.

Task 2.0 Construction on the Gold Kist boiler proceeded on schedule during March. As of the end of the month, the boiler was in place over the furnace and the receiving area was about 90% complete. The status of the wood fuel supply is still unsettled but seems to be improved over the past month. During March, planning for the ribbon cutting at Valdosta was begun. The tentative date for the ceremony was set for the first week in June.

Performance monitoring at the Integrated Products Plant continued during March. A minor interruption of supply required using fuel from open storage to maintain normal operation. Laboratory analysis of the fuel was received. The only problem noted this month was some respiratory irritation experienced by one operator from ash hopper particles in suspension.
Task 3.0  The nuclear density probe has been delivered and initial checkout and calibration is proceeding. J. Walsh and S. Drucker have been licensed by the State of Georgia as principal investigators. Pile construction will be initialed as soon as calibration is completed.

Draft standards of test procedures for moisture and volatile content have been prepared by Georgia Tech and submitted to ASTM. The drafts will be reviewed at the San Diego Meeting of the ASTM E44 committee. Sub-committee and committee ballots are planned this summer.

The computer program for wood energy economics that was developed for Task 5.0 is being used in conjunction with the processing network developed under this task. The results should be available shortly.

Task 4.0  The survey of the textile industry for gasifier applications is being written up with the majority of the material in rough draft form at this time. This report will be in final draft form by the end of April.

The report on low Btu gas burners has been printed, completing that part of the work on surveying equipment needed for firing wood gas in textile industry equipment. A copy of the report is enclosed.

Construction is proceeding well, with major revamping of the control panel and burner sections in progress. All electrical hook-ups for controls, drives, and instrumentation have been reorganized to allow for installation in the new control console and the addition of automatic controllers and safety system. Meetings with the Textile Engineering Department have taken place to define test procedures and schedules.

Task 5.0  The scale model of a wood energy system is complete except for small details. A handout will be prepared this month for use with the model at trade shows.

Work on the trade show/conference to be held in Atlanta on July 13-14 is progressing smoothly. A trip was made to FPRS's Forum 81 to meet with prospective exhibitors. Of the 68 organizations contacted, 17 expressed a strong interest in participating. An additional 36 companies were contacted by phone, of which 25 responded positively.
Our next seminar "Wood Energy Financing" now has 23 people pre-registered. A speakers' meeting was held this month in final preparation for the event. An agenda is attached.

The economic computer analysis is complete and the promotional brochure has been printed. A copy is attached. The analysis will be explained at the financing seminar.

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources

Attachments:

- Milestone Plan and Management Report
- Seminar Agenda
- Economic Brochure
- "Gas Burners for Low Btu Producer Gas"
WOOD ENERGY FINANCING
Wednesday, April 29, 1981

8:00 a.m.  REGISTRATION

8:30 a.m.  INTRODUCTION AND OVERVIEW OF GEORGIA TECH WOOD FUELS PROGRAM
Carol Aton, Chief
Technology Transfer Branch

8:45 a.m.  OVERVIEW OF SSEC WOOD FUELS PROGRAM
Dave Gustashaw, Technical Staff
Southern Solar Energy Center

9:00 a.m.  WOOD FUEL SYSTEMS
Jim Walsh, Research Engineer
Wood Energy Systems Branch

9:30 a.m.  ECONOMICS OF WOOD FUEL
Mike Ehrhardt, Research Engineer
Technology Transfer Branch

10:00 a.m.  BREAK

10:30 a.m.  TAX CONSIDERATIONS AND FINANCIAL EVALUATION
Don Lewis, Audit Manager
Arthur Andersen & Company

11:15 a.m.  COMPUTER MODEL
Mike Ehrhardt, Research Engineer
Technology Transfer Branch

11:30 a.m.  HOW TO SECURE FINANCING
Mike Whitmire, Vice President, Commercial Division
First National Bank of Atlanta

12:15 p.m.  DISCUSSION AND RESULTS FROM COMPUTER ANALYSIS
## Milestone Plan and Management Report

**U.S. Energy Research and Development Administration**

**Milestone Plan and Management Report**

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</table>

**Contract Information**

- **Contract Number**: DE-FG05-79ET23076A001
- **Duration**: March 1, 1979, through March 31, 1981
- **Duration**: 30 months

**Georgia Office of Energy Resources**

270 Washington Street, S.W.
Atlanta, Georgia 30314

**Dollar Amounts**

- **Fiscal Year 1980**: $[ ]
- **Fiscal Year 1981**: $[ ]

**Other Information**

- **Contract Start Date**: April 15, 1980
- **Contract Completion Date**: June 30, 1981

**Milestones**

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<th>Milestone</th>
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<td>1.1 Selection of Feasibility Study Candidates</td>
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<td>[ ]</td>
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<td>1.3 Handbook Development</td>
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<td>[ ]</td>
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<td>1.5 Final Report</td>
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**Notes**

- [ ]

**Appendix**

- [ ]

**Signatures**

- [ ]

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<tr>
<td>2.8</td>
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</table>
# A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY — Phase II, Task 3

**MILESTONE PLAN AND MANAGEMENT REPORT**

### Contract Identification

- **Project Title:** Milestone Plan and Management Report
- **Project Numbers:** DE-FG05-79ET23076 A001
- **Contract Start Date:** April 15, 1980
- **Contract Completion Date:** June 30, 1981

### Fiscal Years and Months

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<td>J</td>
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<td>Availability &amp; Costs</td>
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<td>Storage</td>
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<td>Drying</td>
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<tr>
<td>Interim Reports</td>
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### Remarks

- **Remarks:**

### Signature

- **Project Manager and Date:**
- **Government Technical Representative and Date:**
### Milestone Plan and Management Report

**A State Demonstration Program in Wood Energy -- Phase II, Task 4**

**Contract Identification:**
- Contract Title: A State Demonstration Program in Wood Energy -- Phase II, Task 4
- Contract Number: DE-FG05-79ET23076 A001

**Contracting Party:**
- Georgia Office of Energy Resources
  - 270 Washington Street, S.W.
  - Atlanta, Georgia 30314

**Milestone Planning and Management**

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<tr>
<td>4.2 Site Visits</td>
<td>🟢</td>
<td>🟢</td>
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<tr>
<td>4.3 Survey Report Preparation</td>
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<tr>
<td>4.4 Design a Gasifier System</td>
<td>🟢</td>
<td>🟢</td>
</tr>
<tr>
<td>4.5 Order Mat'l &amp; Equipment</td>
<td>🟢</td>
<td>🟢</td>
</tr>
<tr>
<td>4.6 Shipment of Materials &amp; Equipment</td>
<td>🟢</td>
<td>🟢</td>
</tr>
<tr>
<td>4.7 System Assembly</td>
<td>🟢</td>
<td>🟢</td>
</tr>
<tr>
<td>4.8 Perform Tests</td>
<td>🟢</td>
<td>🟢</td>
</tr>
<tr>
<td>4.9 Write Report</td>
<td>🟢</td>
<td>🟢</td>
</tr>
</tbody>
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**Contractor Information**

- Contractor Name: Georgia Office of Energy Resources
- Contractor Address: 270 Washington Street, S.W.
- Contractor City, State, Zip: Atlanta, Georgia 30314
- Contract Start Date: April 15, 1980
- Contract End Date: June 30, 1981

**Contracting Officer's Signature:**

**Contracting Officer's Name:** [Signature]

**Contracting Officer's Title:** [Title]

**Contracting Officer's Date:** [Date]

**Contracting Office's Address:**
- U.S. Energy Research and Development Administration
- MILESTONE PLAN AND MANAGEMENT REPORT
- PAGE 4 OF 5

---

**Notes:**

- 4.4 Design a Gasifier System: Initials appear in the box indicating completion.
- 4.8 Perform Tests: Box is checked indicating completion.
- 4.9 Write Report: Box is checked indicating completion.
<table>
<thead>
<tr>
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<td>Publications Development</td>
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<td>5.3</td>
<td>Scale Model</td>
<td>J A S O N D J F M A M J</td>
<td></td>
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<tr>
<td>5.4</td>
<td>Computer Analysis</td>
<td>J A S O N D J F M A M J</td>
<td></td>
</tr>
</tbody>
</table>
May 15, 1981

Mr. Ed Bistany
Georgia Office of Energy Resources
270 Washington Street, S.W./Room 615
Atlanta, GA 30334

Dear Ed:

Enclosed please find three copies of this month's progress report on Project A-2400.

The Gold Kist plant has experienced some delays in start-up, but should be operational within the next week.

If you have any questions about this report, please call me at 894-3448.

Sincerely,

William S. Bulpitt, Chief
Wood Energy Systems Division

WSB/jb

Enclosures (3)

cc:  J.L. Birchfield
     R.S. Combes
     M.L. Brown
     G.B. Curtis
     M.S. Dixit
     T.F. McGowan
     C.L. Aton
     Photo Lab
MONTHLY STATUS REPORT

Date: 5/15/81
Period: 4/01/81 to 4/30/81

PROJECT

Title: A State Demonstration Program in Wood Energy-Phase II

CONTRACT

Number: DE-FG05-79ET23076-A001
Start Date: 4/15/80
Completion Date: 6/30/81
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to accelerate the commercialization of wood energy for nonforest industries in Georgia as a replacement for oil and gas fuels.

2.0 CONTRACT TASKS

Task 1.0 Development of a Wood Energy Extension Service to provide widespread technical assistance to industry and institutions. This assistance will take the form of handbook development, feasibility studies, and implementation assistance.

Task 2.0 This task will involve the continued supervision of the three demonstration projects begun under Phase I.

Task 3.0 In-depth analysis of specific problems in supply, storage, and drying of wood fuels delineated in Phase I as well as better definition of property standards.

Task 4.0 Survey of potential wood gasification applications in Georgia and practical test programs on gasifier operational problems.

Task 5.0 Technology-transfer through seminars, publications, tours or demonstration sites, and presentations of national conferences.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

Changes to the work plan in lieu of a third demonstration are being finalized.

4.0 VARIANCES

None to report during this period.
5.0 SUMMARY STATUS AND FORECAST

Activities for the month centered on the following:

Task 1.0 Handbook

Text for handbook is now in second draft. Table of Contents, Appendices 1, 2, 3 (equipment suppliers, State Forestry Commissions, Georgia wood survey), glossary, and introduction are completed and typed.

Conference with M. Brown and D. Fox at Perry Smith Co. yielded excellent information concerning combustion elements and system prices for the past year.

All tables are complete. All figures exist on paper and drawing for reproduction is proceeding. Barring unforeseen delay, material should proceed to printer in early June.

Feasibility Studies

Further modifications were made to the wood system computerized economics program to refine it for cogeneration studies. The cogeneration system reports are essentially completed with the successful execution of the new program.

Work was underway on 5 studies this month and those studies are in the final typing stages. Prices for water tube boilers for the larger installations (100,000 lbs per hour and larger) have been updated. The remainder of the studies should be completed on schedule.

Task 2.0 At the Integrated Products plant, the boiler is still running smoothly. The only problem encountered recently has been the temporary blockage of the rotary fuel valve by small rocks in the wood supply. The chemical analysis of the fuel was completed during April and it revealed fuel moisture content of 55% (wet basis). To provide covered storage for an additional 4 truckloads of fuel, extension of the fuel staging area has been started. Plans for a May tour of the boiler by Georgia Textile Manufacturers Association members have been completed and notifications were mailed.

Boiler construction at Gold Kist continued and all the major components were in place by late April. Start-up is expected to come on schedule in mid-May.

A June date for the dedication ceremony was set and planning has begun. Work on the brochure to be distributed at the dedication was almost complete by the end of the month.
Task 3.0 Preliminary nuclear density probe calibration has been completed. Radiation levels are low but some care will be required to minimize exposure. Calibration testing is proceeding.

Initial efforts to use the Task 5.0 computer programs have identified some problems. These problems are currently being resolved.

Initial moisture and gross caloric valve testing was initiated to check out and calibrate equipment. All tests proceeded normally and no problems were encountered.

Task 4.0 Little work was performed on the textile survey in April due to other priorities. The rough draft is 75% complete and should be finished in May.

The textile drying oven is now in place at the gasifier complex. Reassembly of the control panel is progressing and is 50% complete. A carbon monoxide monitoring system has been received and installed for protection of project personnel. The burner system has been reassembled, complete with larger blower, silencer/filter and support system. Testing on the drying experiments will be started during the next reporting period.

Task 5.0 Our "Wood Energy Financing" seminar, held in Atlanta on April 29, attracted 41 participants. A breakdown of categories is shown below:

<table>
<thead>
<tr>
<th>Audience Category</th>
<th>Number of Participants</th>
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<tbody>
<tr>
<td>Nonforest-related firms</td>
<td>14</td>
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<tr>
<td>Forest-related firms</td>
<td>9</td>
</tr>
<tr>
<td>Government agencies</td>
<td>5</td>
</tr>
<tr>
<td>Consultants</td>
<td>7</td>
</tr>
<tr>
<td>Equipment manufacturers</td>
<td>2</td>
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<tr>
<td>Other</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>41</td>
</tr>
</tbody>
</table>

The evaluation forms that were turned in show the majority of participants found the information useful. A summary of responses is attached as well as a copy of the handout.

A second tour of the wood energy installation at Aragon has been scheduled on May 21 for textile manufacturers. A luncheon and a short briefing is planned. The tour of Gold Kist in Valdosta will be delayed until late July because of the annual plant shutdown for maintenance.
WOODTECH '81, our trade show/conference, has been announced via the attached brochure to 9,000 potential attendees. In addition, press releases have been sent to 100 trade journals as well as newspapers, radio stations, and TV stations throughout Georgia and the Southeast. Personal letters have been sent to 70 potential exhibitors. Speakers for the conference will include the following:

Mr. John Mixon, Georgia Forestry Commission  
Ms. Joan Wood, Tennessee Valley Authority  
Mr. Jerry Scott, Russell Lands, Incorporated  
Mr. Art McGraw, McGraw-Morgan, Incorporated  
Mr. Salem Bullard, Burlington Industries  
Mr. Pierce Merry, Merry Companies  
Mr. Harden Byars, Integrated Products  
Mr. Mitchell Teague, Gold Kist  
Mr. Dan Mulligan, Proctor and Gamble

Volume 1 of our wood energy newsletter "Chips 'n Quips" has been sent to the 2,000 names on our wood mailing list. A copy is attached. Volume 2 has been rescheduled for early June and will cover details of WOODTECH '81. Volume 3 will be published later this summer.

Ed Bistany, Program Coordinator  
Georgia Office of Energy Resources

Attachments:
- Milestone Plan and Management Report  
- Seminar Evaluation  
- Energy Newsletter  
- Trade Show Brochure
<table>
<thead>
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<th>FY80</th>
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<td>Study Preparation</td>
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<td>1.3</td>
<td>Handbook Development</td>
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<td>1.4</td>
<td>Implementation Assistance</td>
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<td>1.5</td>
<td>Final Report</td>
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**Project Years and Months:**
- FY80: January - September
- FY81: October - June

**Selection of Feasibility Study Candidates**
- April 1
- April 30

**Project Completion Date:**
- June 30, 1981
## MILESTONE PLAN AND MANAGEMENT REPORT

**A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 2**

1. **Contractor Name:** Georgia Office of Energy Resources  
   **Address:** 270 Washington Street, S.W.  
   **City:** Atlanta  
   **State:** Georgia  
   **Zip:** 30314

2. **Contractor's Point of Contact:**
   **Name:**  
   **Title:**  
   **Phone:**  
   **Fax:**  
   **E-mail:**  
   **Address:**  
   **City:**  
   **State:**  
   **Zip:**

3. **Milestone Number:**  
   **Description:** Milestone 2

### Milestone Details:

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<td>2.1 Select Demonstration Site</td>
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<td>2.2 Conceptual Designs</td>
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<td>Review of Conversions</td>
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<td>2.6 Analysis &amp; Reporting</td>
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<td>2.7 Disseminate Results</td>
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### Milestone Dates:

- **Start Date:** April 1, 1980
- **End Date:** June 30, 1981

### Milestone Completion:

- **Completed:** Yes
- **Not Completed:** No

**Signature of Contractor's Project Manager:**

**Signature of Government Technical Representative:**
## A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 3

**Georgia Office of Energy Resources**  
270 Washington Street, S.W.  
Atlanta, Georgia 30334

### Milestone Plan and Management Report

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<td><strong>3.3 Standards</strong></td>
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<td><strong>3.5 Drying</strong></td>
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<td><strong>3.6 Interim Reports</strong></td>
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### Notes
- **Projects Completed**:  
  - [ ] All projects completed
- **Projects Ongoing**:  
  - [ ] Some projects ongoing
- **Projects in Progress**:  
  - [ ] All projects in progress

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**Contract Number**: DE-FG02-79ET23076 A001  
**April 15, 1980 to June 30, 1981**

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**U.S. Office of Energy Research and Development Administration**

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**U.S. Office of Energy Research and Development Administration**
# Milestone Plan and Management Report

**A State Demonstration Program in Wood Energy -- Phase II, Task 4**

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<td>![Checkmark]</td>
</tr>
<tr>
<td><strong>4.3</strong> Survey Report Preparation</td>
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<td>![Checkmark]</td>
</tr>
<tr>
<td><strong>4.4</strong> Design a Gasifier System</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
</tr>
<tr>
<td><strong>4.5</strong> Order Mat'ls &amp; Equipment</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
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<tr>
<td><strong>4.6</strong> Shipment of Materials &amp; Equipment</td>
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<tr>
<td><strong>4.7</strong> System Assembly</td>
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<tr>
<td><strong>4.8</strong> Perform Tests</td>
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<tr>
<td><strong>4.9</strong> Write Report</td>
<td>![Checkmark]</td>
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**Georgia Office of Energy Resources**
270 Washington Street, S.W.
Atlanta, Georgia 30334

**April 1, 1980** to **June 30, 1981**
## Milestone Plan and Management Report

**A State Demonstration Program in Wood Energy -- Phase II, Task 5**

**Georgia Office of Energy Resources**
270 Washington Street, S.W.
Atlanta, Georgia 30334

### Fiscal Years and Goals

<table>
<thead>
<tr>
<th>5.1 Seminars and Tours</th>
<th>5.2 Publications Development</th>
<th>5.3 Scale Model</th>
<th>5.4 Computer Analysis</th>
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<td>FY80</td>
<td>J</td>
<td>A</td>
<td>S</td>
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<td>FY81</td>
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### Details

1. **5.1 Seminars and Tours**
2. **5.2 Publications Development**
3. **5.3 Scale Model**
4. **5.4 Computer Analysis**

---

**References**

2. U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station
Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington Street, S.W./Room 615  
Atlanta, GA 30334  

Dear Ed:  

Enclosed please find three copies of this month's progress report on Project A-2400.  

The Gold Kist plant has started successfully and is now operating on 100% wood. Plans for the next seminar are progressing well.  

If you have any questions about this report, please call me at 894-3448.  

Sincerely,  

William S. Bulpitt, Chief  
Wood Energy Systems Division  

WSB/jb  

Enclosures (3)  

cc: J.L. Birchfield  
R.S. Combes  
M.L. Brown  
G.B. Curtis  
R.S. Dixit  
T.F. McGowan  
C.L. Aton  
Photo Lab
MONTHLY STATUS REPORT

Date: 6/12/81
Period: 5/01/81 to 5/31/81

PROJECT

Title: A State Demonstration Program in Wood Energy-Phase II

CONTRACT

Number: DE-FG05-79ET23076-A001
Start Date: 4/15/80
Completion Date: 6/30/81
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, GA 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to accelerate the commercialization of wood energy for nonforest industries in Georgia as a replacement for oil and gas fuels.

2.0 CONTRACT TASKS

Task 1.0 Development of a Wood Energy Extension Service to provide widespread technical assistance to industry and institutions. This assistance will take the form of handbook development, feasibility studies, and implementation assistance.

Task 2.0 This task will involve the continued supervision of the three demonstration projects begun under Phase I.

Task 3.0 In-depth analysis of specific problems in supply, storage, and drying of wood fuels delineated in Phase I as well as better definition of property standards.

Task 4.0 Survey of potential wood gasification applications in Georgia and practical test programs on gasifier operational problems.

Task 5.0 Technology-transfer through seminars, publications, tours or demonstration sites, and presentations of national conferences.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

Proposed changes to the work plan have been forwarded to DOE in Washington.

4.0 VARIANCES

None to report during this period.
5.0 SUMMARY STATUS AND FORECAST

Activities for the month centered on the following:

Task 1.0 Handbook

The draft of the handbook is now complete and is undergoing internal review. A draft has been submitted to McGraw-Hill for consideration. The glossary is completed and the appendix of Equipment Suppliers has been completed.

Feasibility Studies

Efforts in May have been devoted to proofreading and assembly of the feasibility study final reports. Thirteen of the eighteen studies are essentially completed with the remainder in progress.

Task 2.0 Monitoring of the boiler at Integrated Products continued during May and should be completed by August. To promote the wood system at Aragon as a demonstration for other textile industries, a tour of this facility was held in May. The Georgia Textile Manufacturers Association notified members of the tour and 26 people attended. A transcript of questions and answers from this meeting is attached.

The minor problems which had been plaguing the Gold Kist boiler were largely overcome during May and the unit was able to supply all the plant steam requirements. The problems experienced initially were caused by material binding in the feed system. This was compounded by the inexperience of the operating personnel. The boiler is generating an average of 45,000 lb/hr steam currently. At this time, the unit is operating 100% on wood fuel. The dedication of this system has been postponed until late July due to the WOODTECH trade show.

Task 3.0 Mr. J. Walsh represented Georgia Tech at a meeting of the American Society for Testing and Materials Subcommittee E44.12 for Biomass Fuels. Draft standards for moisture, content, volatile content, and wood pellet bulk density were reviewed. Tech has re-drafted these standards subsequent to the meeting and submitted them to ASTM for subcommittee ballot.

In addition, Tech was given the responsibility for drafting a standard test method to determine the combustion characteristics of wood fuels. (Draft Standard No. 169). This standard specifies the test procedures to be used to conduct a proximate and ultimate analysis of wood fuels and to determine the gross caloric value of wood fuels. The specific procedures for conducting individual tests have been developed by ASTM subcommittee
E44.12 for biomass fuels as well as subcommittee E38.01 for refuse derived fuels and committee D2 for wood. The standard has been drafted and submitted to ASTM for subcommittee ballot. As summarized of the specific procedures for the individual tests is as follows:

<table>
<thead>
<tr>
<th>Test</th>
<th>Committee Responsible</th>
<th>Draft Standard No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross Caloric Value</td>
<td>E38</td>
<td>E711</td>
</tr>
<tr>
<td>Proximate Analysis</td>
<td>E44</td>
<td>169</td>
</tr>
<tr>
<td>Moisture</td>
<td>E44</td>
<td>144</td>
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<tr>
<td>Volatiles</td>
<td>E44</td>
<td>145</td>
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<tr>
<td>Ash</td>
<td>D2</td>
<td>D1102*</td>
</tr>
<tr>
<td>Ultimate Analysis</td>
<td>E44</td>
<td>169</td>
</tr>
<tr>
<td>Carbon and Hydrogen</td>
<td>E38</td>
<td>E777*</td>
</tr>
<tr>
<td>Oxygen</td>
<td>E44</td>
<td>169</td>
</tr>
<tr>
<td>Sulfur</td>
<td>E38</td>
<td>E775*</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>E38</td>
<td>E778*</td>
</tr>
<tr>
<td>Ash</td>
<td>D2</td>
<td>D1102*</td>
</tr>
</tbody>
</table>

*Approved Standard

Task 4.0 The project director for the textile industry survey completed a draft report this month. Drawings and calculations will be produced in June and July. Slides and photographs from site visits are in processing.

The control system wiring is 80% complete on the gasifier system for the textile drying experiments. The furnace system for combusting the wood gas and to pipe it into the textile drying oven is in place and complete. The remaining work before tests can be run includes the piping and insulation for bringing the hot gas from the furnace to the dryer and final instrumentation checkout. Two or three shake-down runs are planned in June with testing of the textiles planned in July.

Task 5.0 The computer model for analyzing the potential of wood energy systems in a particular industry brought in 5 requests for additional information. The attached letter, brochure, system explanation, and input forms were sent to the following:

Seattle City Light
Griffin Lumber Co.
York-Shipley, Inc.
Cook & Co.
St. Regis Paper Co.
The WOODTECH '81 conference and trade show has over half of the exhibit space assigned to equipment vendors. Exhibitors will include:

- Steel Kraft Vyncke, Memphis, TN
- Guaranty Performance Company, Inc., Independence, KS
- Aeroglide Corporation, Raleigh, NC
- ABCO Industries, Abilene, TX
- Konus Systems, Inc., Atlanta, GA
- Industrial Technology, Inc., Fort Wayne, IN
- Industrial Boiler Company, Inc., Thomasville, GA
- Heil Company, Knoxville, TN
- Thermotech Systems, Orlando, FL
- Wellons, Inc., Sherwood, OR
- Energy Resource Systems, Minneapolis, MN
- Rader Systems, Inc., Memphis, TN
- Applied Engineering, Orangeburg, SC
- Hurst Boilers, Coolidge, GA

Papers began being received from the 13 speakers for WOODTECH '81. They will be edited and assembled in June into a conference proceeding that will be given out during the conference.
Volume 2 of our wood energy newsletter, "Chips 'n Quips," has been completed and will be sent to 10,000 people in Georgia's industry during early June. A copy will be attached to the June monthly report.

The tour of Integrated Products on May 21 was attended by members of the Georgia Textile Manufacturers Association. The dedication ceremony is scheduled for July 30 at Gold Kist in Valdosta.

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources

Attachments:

- Milestone Plan and Management Report
- Attendance - GTMA Tour
- Conversion Analysis Brochure
- Analysis Cover Letter
- Program Users Manual and Input Sheet
- Questions and Answers - GTMA Meeting
SUMMARY OF ARAGON TOUR
May 21, 1981

B.S. Dixit and M.L. Brown answered some questions during slide presentation. Hoke Kidney and Don Nichols answered many questions relating to their experience with the new wood fired boiler at the plant. These are summarized below.

Q: ARE YOU HAPPY WITH THE SYSTEM?
A: Hoke Kidney said that the new boiler allows for faster charging of his autoclave. Don Nichols (plant engineer) speculates that the difference is that the old Eclipse gas/oil boilers tended to have less steam space and entrained water at full load. The new boiler also has more residual heat, and probably more steel in the shell and larger steam space.

Q: HOW LONG DOES IT TAKE TO RAKE THE ASH OUT OF THE FURNACE; HOW OFTEN IS IT DONE?
A: The ash is raked out approximately twice a day. The air swept feeders and combustion air are shut off, one side of the bed raked out, then the other. Total time for de-ashing is 10 minutes per side. Steam pressure only drops 20 to 30 psig during this period. Observations indicates an ash content of approximately 1%. Ash accumulation varies from 1/2 to 2 wheelbarrow loads. The 55 gallon ash drum on the secondary multiclone is emptied every 1 to 2 days.

Q: WHAT ABOUT WOOD PROCUREMENT?
A: They buy the wood from a sawmill, using their own self-unloading truck. It is sawdust with a small amount of chips and blocks. A vibrating screen keeps the oversize out of the infeed system. They have had a one week period without deliveries. They used their outdoor storage instead, using their small Bobcat, loading a self-unloading spreader which traversed the distance between outdoor pile and the normal fuel staging area.

Q: HOW MANY EXTRA PEOPLE DOES IT TAKE TO RUN THE BOILER?
A: It takes one man full time on all shifts and 1 to 2 hours of a second man on one shift. Previously one man was needed 3/4 time for the gas/oil boilers.

Q: HOW MUCH DID THE SYSTEM COST AND WHAT IS THE COST BREAKDOWN?
A: The total system cost $500,000 with $146,000 of it contributed by the Department of Energy. This cost includes boiler, silo, wood handling, front end loader, and construction costs.
Q: WHAT IS THE PAYBACK PERIOD?
A: Approximately 3½ years.

Q: WHAT IS THE FUEL MOISTURE CONTENT?
A: It varies from 45% to 55%. They do not sample test every load. The truck weight is an excellent indicator of the moisture content. Boiler operation is stable up to 55% moisture content, at 60% it's difficult to maintain fire.

Q: WHAT ABOUT WEEKEND SHUTDOWNS?
A: When the plant works a five day week, the boiler is shutdown on Saturday morning (all the fuel screws are run to empty) and the combustion air turned off. When the boiler is restarted on Sunday, the furnace is still at 400°F and steam pressure at 20 psig, ensuring an easy restart.

Q: WHAT IS THE STACK TEMPERATURE?
A: It is usually at 500°F. An economizer or air preheater can be added but were not chosen for the original installation.

Q: WHAT POLLUTION CONTROL IS USED?
A: Large particles drop out at the return area before entering the tube pass. These are reinjected into the furnace. A first stage multiclone collects char and ash, which is also reinjected into the furnace. The second stage multiclone discharges ash to a 55 gallon drum via an air lock.

Q: DO YOU HAVE WINTER FREEZING?
A: The silo had some frozen material on the walls when it was near empty on one day during the winter. No problems were encountered when it was full of wood fuel.

Q: WHAT TYPE OF WOOD FUEL IS USED -- HARDWOOD, BARK, ETC.?
A: Hardwood in the form of sawdust.

Q: IS THE EFFICIENCY 65% FAIRLY STANDARD FOR WOOD BOILERS?
A: For 50% moisture content, that is reasonable. An air preheater could improve the efficiency. The efficiency could also increase with lower moisture content.
Q: IS THERE A PREHEATER?
A: No. An air preheater would cost around $25,000 and according to the manufacturers, it would payback in approximately 3 years. It was not chosen for this system. As of now, the existing fuel is 85% gas, and 15% oil. If a plant is using a greater percentage of oil, the payback period would be much less.

Q: HOW CAN YOU TELL IF THE SILO IS FULL?
A: The best way we have found is to climb up and look in.

Q: HOW IS THE WOOD TRAILER LOADED BY THE SUPPLIER?
A: It is loaded by front end loader. The trailer is pulled into a dugout area which shortens the reach needed by the loader and makes loading easier.

Q: WHAT TURNDOWN RATIO HAS BEEN ACHIEVED?
A: It can generate steam at 3,000 lb/hr.

Q: HAS THE BOILER BEEN OPERATED AT ABOVE RATED CAPACITY?
A: No.
### A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY — PHASE II, Task 1

**Georgia Office of Energy Resources**
270 Washington Street, S.W.
Atlanta, Georgia 30312

**Selection of Feasibility Study Candidates**

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<thead>
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**Study Preparation**

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**Implementation Assistance**

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**Final Report**

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### Remarks

12. Signature of Contractor's Project Manager and Date

13. Signature of Government Technical Representative and Date
# Milestone Plan and Management Report

**Program:** A State Demonstration Program in Wood Energy -- Phase II, Task 2

**Project Title:** MILESTONE PLAN AND MANAGEMENT REPORT

**Period:** May 1, 1981 to May 31, 1981

**Contract Number:** DE-FG05-79ET23076 A001

**Contractor:** Georgia Office of Energy Resources

**Address:** 270 Washington Street, S.W., Atlanta, Georgia 30313

**Contact Person:** April 15, 1980

**Expiration Date:** June 30, 1981

## Milestones

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<td>2.1 Select Demonstration Site</td>
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<tr>
<td>2.2 Conceptual Designs</td>
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<td></td>
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<tr>
<td>2.3 Contract Document Prep</td>
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<tr>
<td>2.4 Assist in Contractor Selection</td>
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<tr>
<td>2.5 (Site Visits)</td>
<td>Review of Conversions</td>
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<tr>
<td>2.6 Monitor Performance</td>
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<td>▼</td>
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<tr>
<td>2.7 Analysis &amp; Reporting</td>
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<td>2.8 Disseminate Results</td>
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## Contacts

- [Signature of Contractor's Project Manager and Date]

- [Signature of Contractor's Technical Representative and Date]
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<tr>
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<tr>
<td>3.1 Supply &amp; Processing Network</td>
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<tr>
<td>3.2 Availability &amp; Costs</td>
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<td>☐</td>
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<tr>
<td>3.3 Standards</td>
<td>☐</td>
<td>☑</td>
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<tr>
<td>3.4 Storage</td>
<td>☑</td>
<td>☐</td>
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<tr>
<td>3.5 Drying</td>
<td>☑</td>
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<tr>
<td>3.6 Interim Reports</td>
<td>☑</td>
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</table>

**MILESTONE PLAN AND MANAGEMENT REPORT**

**A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY — Phase II, Task 3**

1. **Project Number**: DE-EG05-79ET23076 A001
2. **Project Period**: May 1 through May 31, 1981
3. **Contract Number**: DE-EG05-79ET23076 A001
4. **Contract Start Date**: April 15, 1980
5. **Contract End Date**: June 30, 1981

**Georgia Office of Energy Resources**
270 Washington Street, S.W.
Atlanta, Georgia 30334

**Office of Low, Affordability & Economic Development**

**Summary of Progress**

**Signature of Contracting Officer**

**Signature of Contracting Project Manager and Date**

**Signature of Government Technical Representative and Date**
## Milestone Plan and Management Report

### A State Demonstration Program in Wood Energy -- Phase II, Task 4

**Georgia Office of Energy Resources**  
270 Washington Street, S.W.  
Atlanta, Georgia 30334

**Contract Period:** May 1 through May 31, 1981  
**Contract Number:** DE-FG05-79ET23076 A001

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<tr>
<td>1.1 Industrial Data Collection</td>
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<td>A</td>
</tr>
<tr>
<td>2.2 Site Visits</td>
<td>S</td>
<td>O</td>
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<tr>
<td>3.3 Survey Report Preparation</td>
<td>N</td>
<td>D</td>
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<tr>
<td>4.4 Design a Gasifier System</td>
<td>J</td>
<td>F</td>
</tr>
<tr>
<td>5.5 Order Mat'ls &amp; Equipment Shipment of Materials &amp; Equipment</td>
<td>M</td>
<td>A</td>
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<tr>
<td>6.6 System Assembly</td>
<td>M</td>
<td>J</td>
</tr>
<tr>
<td>7.7 Perform Tests</td>
<td>J</td>
<td>J</td>
</tr>
<tr>
<td>8.8 Write Report</td>
<td>A</td>
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**Former Project Manager:**  
**Signatures of Government Technical Representative and Data:**
### Milestone Plan and Management Report

#### A State Demonstration Program in Wood Energy -- Phase II, Task 5

**Contract Number:** DE-FG05-79ET23076 A001

**Contract Start Date:** April 15, 1980

**Participant Organization:**

Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

**Program Period:** May 1, 1981 through May 31, 1981

**Contract Completion Date:** June 30, 1981

#### Milestone Schedule

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<tr>
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<td>Seminars and Tours</td>
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<td>5.2</td>
<td>Publications Development</td>
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<td>5.3</td>
<td>Scale Model</td>
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</tr>
<tr>
<td>5.4</td>
<td>Computer Analysis</td>
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</table>

**Legend:**
- **A** indicates that the milestone is achieved.
- Milestones are marked with x's for progress tracking.

### Remarks

- [Remarks text]

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**Department of Energy Program Manager and Date:**

**Signature of Government Technical Representative and Date:**
Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington Street, S.W./Room 615  
Atlanta, GA 30334  

Dear Ed:

Enclosed are 3 copies of June's progress report for Project A-2400.

As you know, we just had a successful 2-day seminar "WOODTECH '81" which took place July 13 & 14. The attendees and vendors seemed pleased with the results. This will be covered in next month's progress report. We are also gearing up for the July 30th dedication of the Gold Kist-Valdosta facility.

Please call me at 894-3636 if you have any questions on this report.

Sincerely yours,

Thomas F. McGowan, Asst. Div. Chief  
Wood Energy Systems Division

TFM/jb

Enclosures

cc: J.L. Birchfield  
    R.S. Combes  
    M.L. Brown  
    G.C. Curtis  
    B.S. Dixit  
    T.F. McGowan  
    C.L. Aton  
    Photo Lab
MONTHLY STATUS REPORT

Date: 7/12/81
Period: 6/01/81 to 6/31/81

PROJECT

Title: A State Demonstration Program in Wood Energy-Phase II

CONTRACT

Number: DE-FG05-79ET23076-A001
Start Date: 4/15/80
Completion Date: 6/30/81
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, GA 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to accelerate the commercialization of wood energy for nonforest industries in Georgia as a replacement for oil and gas fuels.

2.0 CONTRACT TASKS

Task 1.0 Development of a Wood Energy Extension Service to provide widespread technical assistance to industry and institutions. This assistance will take the form of handbook development, feasibility studies, and implementation assistance.

Task 2.0 This task will involve the continued supervision of the two demonstration projects begun under Phase I.

Task 3.0 In-depth analysis of specific problems in supply, storage, and drying of wood fuels delineated in Phase I as well as better definition of property standards.

Task 4.0 Survey of potential wood gasification applications in Georgia and practical test programs on gasifier operational problems.

Task 5.0 Technology-transfer through seminars, publications, tours or demonstration sites, and presentations of national conferences.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

None to report during this period.
5.0 SUMMARY STATUS AND FORECAST

Activities for the month centered on the following:

Task 1.0 Handbook

Handbook undergoing final editing and internal review. Some work remains on preparation of drawing and figures.

Feasibility Studies

Studies are essentially complete and are now undergoing final editing.

Final Report

Final report has been outlined and writing begun.

WOODTECH '81

Assistance is being supplied for management and technical presentation.

Task 2.0 During June, the monitoring of Integrated Products was almost completed. One final visit to the site is scheduled for July. The collected data was being assembled to be included in the final report.

Operation of the Gold Kist boiler continued normally during June. Steam production reached 50,000 lb/hr using a mixture of wood and pecan shells as fuel. Discussions continued on how the monitoring will be conducted. Preliminary arrangements for the ribbon cutting, to be held July 30, were started.

Task 3.0 Four drafts were completed and revised for ASTM standards on wood fuel testing. The laboratory facility for testing wood fuel has been expanded. Checkout tests were run on volatile, ash and moisture contents, and higher heating value of wood fuels using recently acquired equipment.

Two waste wood test piles were built at the Integrated Products Co. plant at Aragon, Georgia. This plant installed a wood fired boiler under Task 2, and allowed us to build these test piles in their outdoor storage area. Both piles are conical shaped, 10' high, and 20' in diameter. One is covered with a tarp on a wood frame to simulate covered storage while the other is open to the elements. The piles are instrumented with thermocouples and have PVC pipe built in to act as traverse paths for a nuclear density probe. This probe will monitor changes in bulk density while samples are withdrawn for higher heating value and moisture content determination.
Task 4.0 The report on the survey of Georgia's textile industry for gasification applications is in final draft form. It will be finished in time for presentation of the results at the WOODTECH '81 conference July 13 & 14. The data suggests that 70% of the companies surveyed have a sincere interest in using wood energy in some manner to fuel their plants.

A shakedown run has taken place on the pilot plant gasifier to check out new controls and systems. All systems are working well enough to perform test runs although some calibration of new instrumentation remains to be done. The first fabric tests are scheduled for July 10th, the second draft for the 23rd.

Task 5.0 Plans for the WOODTECH '81 trade show/conference have been finalized and more than 100 attendees are expected. Some 40 vendors have signed up which is a sell-out of all the available display space.

Volume 2 of Chips 'n Quips was mailed to 10,000 industries and other interested parties in the Southeast. A copy is attached. Volume 3 is scheduled to be mailed in August.

Invitations to the July 30 Valdosta ribbon-burning ceremony have been mailed. A copy is attached.

A brochure was published on "Wood Energy for Nonforest Industries" to accompany the scale model at our WOODTECH '81 booth. A copy is attached.

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources

Attachments:

- Milestone Plan & Management Chart
- Chips ' Quips - Volume 2
- Valdosta Invitation Brochure
- "Wood Energy for Nonforest Industries" Brochure
# A State Demonstration Program in Wood Energy -- Phase II, Task 5

**Georgia Office of Energy Resources**
270 Washington Street, S.W.
Atlanta, Georgia 30334

**Contract Number:** DE-FG05-79ET23076 A001

**Time Period:**
- **April 15, 1980**
- **June 30, 1981**

## Milestone Plan and Management Report

<table>
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<th>Number</th>
<th>Description</th>
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<td>5.4</td>
<td>Computer Analysis</td>
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**Preside Committee**
### Milestone Plan and Management Report

**Project Name:** A State Demonstration Program in Wood Energy -- Phase II, Task 4

**Period:** June 1 through June 30

**Contract Number:** DE-FG05-79ET23076 A001

**Contract Start Date:** April 13, 1980

**Contract Completion Date:** June 30, 1981

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<td>4.1</td>
<td>Industrial Data Collection</td>
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<td>S</td>
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<tr>
<td>4.2</td>
<td>Site Visits</td>
<td>J</td>
<td>A</td>
</tr>
<tr>
<td>4.3</td>
<td>Survey Report Preparation</td>
<td>J</td>
<td>A</td>
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<tr>
<td>4.4</td>
<td>Design a Gasifier System</td>
<td>J</td>
<td>A</td>
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<tr>
<td>4.5</td>
<td>Order Materials &amp; Equipment</td>
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<td>A</td>
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<td>4.6</td>
<td>Shipment of Materials &amp; Equipment</td>
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<td>4.7</td>
<td>System Assembly</td>
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<td>4.8</td>
<td>Perform Tests</td>
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<tr>
<td>4.9</td>
<td>Write Report</td>
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**Contract Summary:**
- **Contract Description:** Georgia Office of Energy Resources (OER) is responsible for developing and demonstrating wood energy systems.
- **Team Members:** The project team includes various contractors and subcontractors responsible for different aspects of the project.
- **Timeline:** The project is scheduled to run from April 13, 1980, to June 30, 1981.

**Milestones:**
- **Industrial Data Collection:** Completed
- **Site Visits:** In Progress
- **Survey Report Preparation:** In Progress
- **Design a Gasifier System:** In Progress
- **Order Materials & Equipment:** Planned
- **Shipment of Materials & Equipment:** Planned
- **System Assembly:** Planned
- **Perform Tests:** Planned
- **Write Report:** Planned
1. Contract Identification
   A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 3
   Georgia Office of Energy Resources
   270 Washington Street, S.W.
   Atlanta, Georgia 30334

2. Reporting Period
   June 1 through June 30

3. Contract Number
   DE-FC05-79ET21076 A001

4. Contract Start Date
   April 15, 1980

5. Contract Completion Date
   June 30, 1981

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<td>3.6 Interim Reports</td>
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5. Notes

12. Signature of Contractor's Project Manager and Date

13. Signature of Government Technical Representative and Date
## Milestone Plan and Management Report

**Title:** A State Demonstration Program in Wood Energy -- Phase II, Task 2

**Contract Number:** DE-FG05-79ET23076 A001

**Contract Start Date:** April 15, 1980

**Contract Completion Date:** June 30, 1981

**Contracting Office:** Georgia Office of Energy Resources

**Address:** 270 Washington Street, S.W., Atlanta, Georgia 30334

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### Fiscal Years and Milestones

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**Timeline:**

- **Select Demonstration Site**
- **Conceptual Designs**
- **Contract Document Prep**
- **Assist in Contractor Selection**
- **Review of Conversions**
- **Monitor Performance**
- **Analysis & Reporting**
- **Disseminate Results**

---

**Signatures:**

- **Contract Manager**
- **Government Technical Representative**
**A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- PHASE II, Task 1**

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<td>1.5</td>
<td>Final Report</td>
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**Notes:**
- Entry blank indicates that the multiple occurrence of an event has not been resolved.
- A solid bar indicates that an event has been completed.
- A diagonal bar indicates that an event is in progress.
- A dash indicates that an event has not been assigned.

**Milestone Plan and Management Report**

- **Contract Number:** DE-FG05-79ET23076A001
- **Contract Start Date:** April 15, 1980
- **Contract Completion Date:** June 30, 1981

**Georgia Office of Energy Resources**
270 Washington Street, S.W.
Atlanta, Georgia 30334
Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington Street, S.W./Room 615  
Atlanta, GA 30334

Dear Ed:

Enclosed are 3 copies of June's progress report for Project A-2400.

The high points of this month's work was the dedication of the wood-fired boiler at the Gold Kist Soy Plant in Valdosta, and the very successful WOODTECH '81 trade show and conference.

Please call me at 894-3636 if you have any questions on this report.

Sincerely yours,

Thomas F.K. McGowan  
Asst. Div. Chief  
Wood Energy Systems Division

TFM/jb

Enclosures (3)

cc: J.L. Birchfield  
R.S. Combes  
M.L. Brown  
G.B. Curtis  
B.S. Dixit  
T.F. McGowan  
C.L. Aton  
J.L. Walsh  
D.E. Harris  
Photo Lab
MONTHLY STATUS REPORT

Date: 8/19/81
Period: 7/01/81 to 7/31/81

PROJECT

Title: A State Demonstration Program in Wood Energy-Phase II

CONTRACT

Number: DE-FG05-79ET23076-A001
Start Date: 4/15/80
Completion Date: 6/30/81
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, GA 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to accelerate the commercialization of
wood energy for nonforest industries in Georgia as a replacement for oil
and gas fuels.

2.0 CONTRACT TASKS

Task 1.0 Development of a Wood Energy Extension Service to provide wide-
spread technical assistance to industry and institutions. This
assistance will take the form of handbook development, feasibili-
ty studies, and implementation assistance.

Task 2.0 This task will involve the continued supervision of the two
demonstration projects begun under Phase I.

Task 3.0 In-depth analysis of specific problems in supply, storage,
and drying of wood fuels delineated in Phase I as well as
better definition of property standards.

Task 4.0 Survey of potential wood gasification applications in Georgia
and practical test programs on gasifier operational problems.

Task 5.0 Technology-transfer through seminars, publications, tours or
demonstration sites, and presentations of national conferences.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

Changes in project plan covered in text.

4.0 VARIANCES

Changes in project plan covered in text.
Activities for the month centered on the following:

Task 1.0 Handbook. Final editing of handbook almost complete. Drawings and figures are now complete. Retyping and proofing are still to be done.

Feasibility studies. Final editing of feasibility studies nearly complete.


Task 2.0 During June and July, work progressed on the Phase II final report. By the end of July, effort on the sections describing the overall program and specifics on the Aragon demonstration was largely completed. The report will be concluded when monitoring of the Gold Kist installation is finished in November.

Monitoring on the Integrated Products facility was completed during July. The data was compiled and put into form for inclusion in the final report.

The daily boiler log and steam flow charts for July have been received. However, until estimates of the amount of fuel burned is given, boiler efficiency cannot be calculated. Gold Kist assures us that the wood monitoring problems are being taken care of.

Georgia Tech's public relations department has asked for information on the energy cost for July 1981 in comparison to Gold Kist's energy costs in July 1980. He plans to report this to national news networks.

The ribbon cutting ceremony at the Gold Kist Soy Plant in Valdosta was a success. The large turnout and components of those in attendance were most favorable. For details on the ceremony, refer to the Technology Transfer section of this report.

Task 3.0 Two wood chips piles have been built at the Integrated Products Company Plant at Aragon, Georgia. Data has been taken from both the wood chip and wood waste piles. Data reduction is currently underway and results should be available shortly.

Samples and density probe measurements were made at the Burlington Industries Plant at Rabun Gap, Georgia. Some difficulty was experienced with the testing due to the size of the entry hole made by the auger. A smaller auger head is on order. Data from sample analysis is currently being reduced.
Task 4.0 The textile survey report was finished in time for the presentation at WOODTECH '81. It will be printed in a final report form, and has already been distributed at the conference as a paper.

The first test run on the gasifier took place on July 10. Sixty fabric samples were run. All were white materials ranging from cottons to synthetics. No visible discoloration or damage occurred to the samples, but laboratory analysis in the Textile Engineering Department has not been completed.

A second and final test run has been rescheduled for August 6. A printing temperature readout malfunctioned after the July 10th run, necessitating the procurement of electronic parts. This second test run will use colored fabrics, carpet samples, and fabrics impregnated with curing agents. Control samples of all these materials will be dried in an electrically heated oven to provide a baseline reference.

A schedule for additional parametrics testing of air, steam, fuel rates, and gasifier efficiency has been drawn up. This program will be run between August and December with funds provided by redirection of Task 2 to reflect major emphasis on research efforts.

Task 5.0 The WOODTECH '81 conference and trade show on industrial wood energy was held July 13 & 14 at the Dunfey Atlanta Hotel. The total number of conference registrants and vendor participants was 153 representing 18 states throughout the U.S. Over 1/3 of these participants were new to Georgia Tech seminars.

Dr. Thomas E. Stelson delivered the keynote address to begin the two-day conference. Thirteen speakers presented their experiences with various phases of the wood energy field from supply and brokering to the design, startup, and long term operation of successful wood-fired systems throughout the U.S.

Conference sessions ran Monday morning and early afternoon, and Tuesday morning with a bus tour to the Integrated Products demonstration site in Aragon, Georgia, Tuesday afternoon. Trade show exhibits were open both days for a close-up look at state-of-the-art wood energy equipment, and two luncheons and a Monday evening reception provided an opportunity for everyone to exchange ideas and experiences.
The formal dedication ceremony for the wood energy system at the soybean oil extraction facility operated by Gold Kist, Inc., in Valdosta, Georgia, was held July 30. The "ribbon burning" was attended by 68 people. The mayor of Valdosta welcomed everyone to town while representatives from Gold Kist, Georgia Tech, and the Georgia Office of Energy Resources explained their role in making this project a reality. Local NBC and ABC TV affiliates as well as the Valdosta Daily Times newspaper covered the event.

A brochure prepared for the dedication is attached.

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources

Attachments:

- Milestone Plan & Management Chart
- WOODTECH '81 Handout
- Valdosta Brochure
- 5 color Xerox slides from WOODTECH '81
<table>
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1.1 Selection of Feasibility Study Candidates

1.2 Study Preparation

1.3 Handbook Development

1.4 Implementation Assistance

1.5 Final Report

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## Milestone Plan and Management Report

**Project Title:** A State Demonstration Program in Wood Energy — Phase II, Task 2

**Contractor Name and Address:**
Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

**Contract Number:** DE-FG05-79ET23076 A001

**Reporting Period:** July 1 through July 31

**Contract Start Date:** April 15, 1980

**Contract Completion Date:** December 31, 1981

### Milestones

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**Signatures:**

1. Signature of Contractor's Project Manager and Date

2. Signature of Government Technical Representative and Date
### Milestone Plan and Management Report

**A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 3**

**Georgia Office of Energy Resources**
270 Washington Street, S.W.
Atlanta, Georgia 30334

**Contract Number:** DE-FG05-79ET23076 A001
**Contract Start Date:** April 15, 1980
**Contract Completion Date:** December 31, 1981

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**Availability & Costs**

**Standards**

**Storage**

**Drying**

**Interim Reports**

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**12. Signature of Contracting Officer and Date:**

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**13. Signature of Government Technical Representative and Date:**
**MILESTONE SCHEDULE AND STATUS REPORT**

1. Contract Identification
   - A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 4

2. Reporting Period
   - July 1 through July 31

3. Contract Number
   - DE-FG05-79ET23076 A001

4. Contractor (name, address)
   - Georgia Office of Energy Resources
   - 270 Washington Street, S.W.
   - Atlanta, Georgia 30334

5. Contract Start Date
   - April 15, 1980

6. Contract Completion Date
   - December 31, 1981

7. Identification Number
   - 4.0 Current Test Program
     - 4.1 Redesign System
     - 4.2 Order Equipment
     - 4.3 Design Test Program
     - 4.4 Modify Equipment
     - 4.5 Perform Task
     - 4.6 Analyze Data
     - 4.7 Write Report

8. Reporting Category (e.g., contract line item or work breakdown structure element)

9. Fiscal Years and Months
   - J A S O N D J F M A M J J A S O N D

10. Percent Complete
    - 4.0 Current Test Program

11. Remarks

12. Signature of Contractor's Project Manager and Date

13. Signature of Government Technical Representative and Date
# Milestone Plan and Management Report

## Project Information

**Contract Title:** A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 5

**Contractor:** Georgia Office of Energy Resources

**Address:** 270 Washington Street, S.W., Atlanta, Georgia 30334

**Contract Number:** DE-FG05-79ET23076 A001

**Start Date:** April 15, 1980

**End Date:** December 31, 1981

## Milestone Plan

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## Progress

1. **Seminars and Tours**
   - June 1-30
   - July 1-31

2. **Publications Development**
   - June 1-30
   - July 1-31

3. **Scale Model**
   - June 1-30
   - July 1-31

4. **Computer Analysis**
   - June 1-30
   - July 1-31
Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington St., S.W./Room 615  
Atlanta, GA  30334

Dear Ed:

Enclosed are three copies of August's progress report for Project A-2400.

The high points of this month's work were the completion of the feasibility studies and the handbook, which is currently being printed.

Please call me at 894-3636 if you have any questions concerning this month's activities.

Sincerely,

William S. Bulpitt, Chief  
Wood Energy Systems Division

WSB/jb

Enclosures (3)
MONTHLY STATUS REPORT

Date: 9/18/81
Period: 8/01/81 to 8/31/81

PROJECT

Title: A State Demonstration Program in Wood Energy-Phase II

CONTRACT

Number: DE-FG05-79ET23076-A001
Start Date: 4/15/80
Completion Date: 12/31/81
Contractor: Georgia Office of Energy Resources
270 Washington St., S.W.
Atlanta, GA 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to accelerate the commercialization of wood energy for nonforest industries in Georgia as a replacement for oil and gas fuels.

2.0 CONTRACT TASKS

Task 1.0 Development of a Wood Energy Extension Service to provide widespread technical assistance to industry and institutions. This assistance will take the form of handbook development, feasibility studies, and implementation assistance.

Task 2.0 This task will involve the continued supervision of the two demonstration projects begun under Phase I.

Task 3.0 In-depth analysis of specific problems in supply, storage, and drying of wood fuels delineated in Phase I as well as better definition of property standards.

Task 4.0 Survey of potential wood gasification applications in Georgia and practical test programs on gasifier operational problems.

Task 5.0 Technology-transfer through seminars, publications, tours or demonstration sites, and presentations of national conferences.

Task 6.0 High technology wood energy research program devoted to applications for Georgia's industrial requirements.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

An additional task (6.0) was added to promote the use of wood energy in new applications. Task 1.0 will be complete with the issuance of the feasibility studies in September. This task will be discontinued after that action.

4.0 VARIANCES

None to report during this period.
5.0 SUMMARY STATUS AND FORECAST

Activities for the month centered on the following:

Task 1.0 The work assignments for Task 1.0 were essentially completed this month. The feasibility studies were completed and are currently being distributed. The handbook is complete and is now being printed.

Task 2.0 Gold Kist in Valdosta has had their wood boiler running all summer. Good data is being collected on all systems except for fuel consumption. They claim that problems with the computer, used to totalize the volume of fuel burned, have not been solved. Even though our contract with them requires this data, we may have to average the boiler fuel consumption based on purchasing data. Bill Bulpitt will tour the plants with NBC news on September 14. David Harris will also be visiting the plant in September.

Task 3.0 Data reduction of samples and measurements taken from the wood chip and wood waste piles at Aragon is still in progress. The density probe has been recalibrated to verify some of the earlier measurements taken. Some early problems with the bomb calorimeter tests have been resolved and the testing is now proceeding normally.

Comments on the draft standards for moisture, volatile content, bulk density, and fuel properties of biomass fuels are being received. In general, none of the comments are major and approval is expected shortly.

Task 4.0 All test runs on the textile drying experiments have been finished. Analysis of the fabrics dried and cured with wood gas, and control samples dried in an electrically heated oven have been analyzed for color change (and other proportions) by the Textile Engineering Department. The raw data looks encouraging. The wood gas does not appear to cause product degradation.

Report writing is in progress by both the Textile Engineering Department and the Wood Energy Systems Division. A rough draft should be finished in September.

All major equipment needed for the parametric gasifier test program have been specified and ordered. Some modification of the equipment is underway, ahead of schedule, taking advantage of the weather and personnel availability. The major change in the auxiliaries in construction of a large refractory lined furnace capable of withstandning 3000°F flame temperature and positive pressures. This will be used in conjunction with high temperature ceramic orifice plates to measure the net output of the burned wood gas.
Task 5.0 The final report is in the process of being written. The publications order list has been expanded by offering 3 more wood energy reports. Copies of the WOODTECH '81 proceedings, Gold Kist, and Integrated Products brochures and other reports and papers are frequently requested.

Task 6.0 Initial efforts on this task were directed to study of wood energy in mineral processing. Important mineral industries in Georgia which offer the prospect of substantial wood utilization include kaolin, fuller's earth, and lime processing. Research focused on determining the impact of wood usage in each situation.

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources

Attachment:

- Milestone Plan & Management Chart
1. **Contract Identification**
   A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 2

2. **Reporting Period**
   August 1 through August 31

3. **Contract Number**
   DE-FT05-79ET23076 A001

4. **Contractor (name, address)**
   Georgia Office of Energy Resources
   270 Washington Street, S.W.
   Atlanta, Georgia 30334

5. **Contract Start Date**
   April 15, 1980

6. **Contract Completion Date**
   December 31, 1981

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11. **Remarks**

12. **Signature of Contractor's Project Manager and Date**

13. **Signature of Government Technical Representative and Date**
# MILESTONE PLAN AND MANAGEMENT REPORT

## A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY – Phase II, Task 3

**Georgia Office of Energy Resources**
270 Washington Street, S.W.
Atlanta, Georgia 30334

**Contracting Agency**

**Contracting Officer**

**Contracting Officer's Signature**

**Contract Number**

**DE-FC05-79ET23076 A001**

**Grant or Agreement Number**

**Georgia Office of Energy Resources**

**Project Title**

**A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY – Phase II, Task 3**

**Project Description**

**Project Period**

**August 1 through August 31**

**Project Completion Date**

**June 14, 1980**

**Project Completion Milestones**

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**Mile of the Government Funding of the Project**

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**Project Manager and Date**

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**Contracting Officer**

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**Contracting Officer's Signature**

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**Contract Number**

---

**DE-FC05-79ET23076 A001**

---

**Project Title**

---

**A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY – Phase II, Task 3**

---

**Project Period**

---

**August 1 through August 31**

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**Project Completion Date**

---

**June 14, 1980**

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**Project Completion Milestones**

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**Project Manager and Date**

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**Contracting Officer**

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**Contracting Officer's Signature**

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**Contract Number**

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**DE-FC05-79ET23076 A001**

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**Project Title**

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**A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY – Phase II, Task 3**

---

**Project Period**

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**August 1 through August 31**

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**Project Completion Date**

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**June 14, 1980**
**MILESTONE SCHEDULE AND STATUS REPORT**

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# MILESTONE SCHEDULE AND STATUS REPORT

## Contract Identification
**A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY — Phase II, Task 5**

## Contractor Information
- **Georgia Office of Energy Resources**
- **270 Washington Street, S.W.**
- **Atlanta, Georgia 30334**

## Contract Number
- **DE-FG05-79ET23076 A001**

## Reporting Period
- **August 1 through August 31**

## Contract Start Date
- **April 15, 1980**

## Contract Completion Date
- **June 30, 1981**

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## Remarks

## Signatures
- **Contractor’s Project Manager and Date**
- **Government Technical Representative and Date**
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4. Contractor (name, address)
Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

5. Start Date
1981 August

6. Contract Completion Date
31 December 1981

7. Contract Number
A001

8. Reporting Category (e.g., contract line or work breakdown structure element)

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10. Percent Complete

11. Remarks

12. Signature of Contractor's Project Manager and Date

13. Signature of Government Technical Representative and Date
Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington Street, S.W./Room 615  
Atlanta, GA 30334  

Dear Ed:  

Three copies of September's progress report are enclosed for Project A-2400.  

We are pleased to note that Bill Bulpitt's efforts with the NBC news team at the Valdosta/Gold Kist demonstration site resulted in national coverage of the project on the Today Show.  

Please call me at 894-3636 if you have any questions concerning this month's activities.  

Sincerely yours,  

William S. Bulpitt, Chief  
Wood Energy Systems Division  

WSB/jb  

Enclosures (3)  

cc: J.L. Birchfield  
R.S. Combes  
M.L. Brown  
G.B. Curtis  
B.S. Dixit  
D.E. Harris  
T.F. McGowan  
C.L. Aton  
J.L. Walsh  
Photo Lab (2)  

AN EQUAL EMPLOYMENT/EDUCATION OPPORTUNITY INSTITUTION
MONTHLY STATUS REPORT

Date: 10/19/81
Period: 9/01/81 to 9/30/81

PROJECT

Title: A State Demonstration Program in Wood Energy-Phase II

CONTRACT

Number: DE-FG05-79ET23076-A001
Start Date: 4/15/80
Completion Date: 12/31/81
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, GA 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to accelerate the commercialization of wood energy for nonforest industries in Georgia as a replacement for oil and gas fuels.

2.0 CONTRACT TASKS

Task 1.0 Development of a Wood Energy Extension Service to provide widespread technical assistance to industry and institutions. This assistance will take the form of handbook development, feasibility studies, and implementation assistance.

Task 2.0 This task will involve the continued supervision of the two demonstration projects begun under Phase I.

Task 3.0 In-depth analysis of specific problems in supply, storage, and drying of wood fuels delineated in Phase I as well as better definition of property standards.

Task 4.0 Survey of potential wood gasification applications in Georgia and practical test programs on gasifier operational problems.

Task 5.0 Technology-transfer through seminars, publications, tours, or demonstration sites, and presentations of national conferences.

Task 6.0 High technology wood energy research program devoted to applications for Georgia's industrial requirements.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

None to report during this period.
5.0 SUMMARY STATUS AND FORECAST

Activities for the month centered on the following:

Task 1.0 The handbook check-copy has been returned by the printer and is being proofed.

Task 2.0 Bill Bulpitt, Georgia Tech engineer, was interviewed by an NBC news team at the Gold Kist soy plant in Valdosta. The boiler plant has had very little maintenance problems this month. The problems with the computer monitoring are believed to be resolved. The price of wood fuel is averaging $14 per ton.

David Harris will visit the plant and meet with its management in October.

Task 3.0 Data reduction of samples and measurements taken from the piles at Aragon continued. The results are being formulated for direct comparison with data obtained by Marshall White of Virginia Polytechnic Institute. The current plant is to compare all data taken through October to determine trends. Specifically, the density measurements will be used to fill in data that could only be estimated by VPI.

The draft standards for moisture and volatile content received one negative vote from the ASTM subcommittee E44.12; and the standard for bulk density received two negative votes. These negative votes will be resolved the October meeting of Committee E44.12 in Philadelphia, PA.

Task 4.0 The final report on the textile drying project is 80% complete with only the conclusions and introduction requiring further writing. The report will be ready for publication in late October.

Major progress has been made on alteration of the wood gasification pilot plant for the upcoming parametric test program. The burner systems were disassembled and steel work supports for the new furnace were fabricated. The steel shell of the furnace and its mounting flanges were cut and assembled. The new motor was installed on the combustion air for raising the power from 5-20 horsepower to extend the range of the burner and furnace system. The major obstacle to performing the tests is the arrival of castable furnace refractory and ceramic orific plates. Both items have long lead times and our supply department is expediting the shipment. As a result of the late shipments, the project will have reduced staffing for one month until supplies and equipment are on hand for final assembly and testing.
Task 5.0  Arrangements were made for Mr. Bill Bulpitt, Project Director, to be interviewed by Bonnie Erbe for NBC's "Today" Show.

Work is continuing on the final report.

Requests for wood energy information are being filled.

Task 6.0  Work continued on advanced wood fuel research for Georgia industries. Much of the effort in September focused on the study of wood fuel for lime calcining. This research could be beneficial to pulp and paper industries.

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources

Attachments:

  o Milestone Plan and Management Chart
# Milestone Schedule and Status Report

**U.S. Department of Energy**

**MILESTONE SCHEDULE AND STATUS REPORT**

1. **Contract Identification**
   - A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 2

2. **Reporting Period**
   - September 1 through September 30

3. **Contract Number**
   - DE-FT05-79ET23076 A001

4. **Contractor (Name, Address)**
   - Georgia Office of Energy Resources
   - 270 Washington Street, S.W.
   - Atlanta, Georgia 30334

5. **Contract Start Date**
   - April 15, 1980

6. **Contract Completion Date**
   - December 31, 1981

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<td>2.8 Disseminate Results</td>
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**Remarks**

11. **Signature of Contractor's Project Manager and Date**
13. **Signature of Government Technical Representative and Date**
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<td>3.6 Interim Reports</td>
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**Timeline and Milestones Report**

**MILESTONE PLAN AND MANAGEMENT REPORT**

A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 3

**Project Period:**
September 1, 1980 - September 30, 1980

**Contract Number:**
DE-FC05-79ET23076 A001

**Contract Start Date:**
April 15, 1980

**Contract End Date:**
June 30, 1981

**Achievements:**
- Supply & Processing Network
- Availability & Costs
- Standards
- Storage
- Drying
- Interim Reports

**Agency:**
Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334
---

**DOE Form CRA 35**

**MILESTONE SCHEDULE AND STATUS REPORT**

1. **Contract Identification**
   - A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 4

2. **Reporting Period**
   - September 1 through September 30

3. **Contract Number**
   - DE-FG05-79ET23076 A001

4. **Contractor (Name, Address)**
   - Georgia Office of Energy Resources
   - 270 Washington Street, S.W.
   - Atlanta, Georgia 30334

5. **Contract Start Date**
   - April 15, 1980

6. **Contract Completion Date**
   - December 31, 1981

7. **Identification Number**
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8. **Reporting Category (e.g., contract task, major work breakdown structure element)**

9. **Fiscal Years and Months**
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10. **Percent Complete**
    - Planned
    - Actual

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<td>4.6 Analyze Data</td>
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11. **Remarks**

12. **Signature of Contractor's Project Manager and Date**

13. **Signature of Government Technical Representative and Date**

---
| 5.1 | Seminars and Tours |
| 5.2 | Publications and Development |
| 5.3 | Scale Model |
| 5.4 | Computer Analysis |

**Fiscal Years and Months**

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**Progress Complete**

- Incomplete
- Complete

**Signature of Contractor's Project Manager and Date**

**Signature of Government Technical Representative and Date**
**U.S. DEPARTMENT OF ENERGY**

**MILESTONE SCHEDULE AND STATUS REPORT**

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<td>6.3</td>
<td>Formulate Proposals</td>
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<td>6.4</td>
<td>Submit Proposals</td>
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<tr>
<th>13. Signature of Government Technical Representative and Date</th>
</tr>
</thead>
</table>
Mr. Ed Bistany
Georgia Office of Energy Resources
270 Washington Street, S.W./Room 615
Atlanta, GA 30334

Dear Ed:

Enclosed please find two copies of our latest progress report. As you know, this project is now winding down and we are still seeking follow-on funding from DOE, but don't have anything definite yet.

If you have any questions, please call me at 894-3448.

Sincerely,

William S. Bulpitt, Chief
Wood Energy Systems Division

WSB/jb

Enclosures (3)

cc: J.L. Birchfield
R.S. Combes
M.L. Brown
G.B. Curtis
B.S. Dixit
D.E. Harris
T.F. McGowan
C.L. Aton
J.L. Walsh
Photo Lab (2)
MONTHLY STATUS REPORT

Date: 11/19/81
Period: 10/01/81 10/31/81

PROJECT

Title: A State Demonstration Program in Wood Energy-Phase II

CONTRACT:

Number: DE-FG05-79ET23076-A001
Start Date: 4/15/80
Completion Date: 12/31/81
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, GA 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to accelerate the commercialization of wood energy for nonforest industries in Georgia as a replacement for oil and gas fuels.

2.0 CONTRACT TASKS

Task 1.0 Development of a Wood Energy Extension Service to provide widespread technical assistance to industry and institutions. This assistance will take the form of handbook development, feasibility studies, and implementation assistance.

Task 2.0 This task will involve the continued supervision of the two demonstration projects begun under Phase I.

Task 3.0 In-depth analysis of specific problems in supply, storage, and drying of wood fuels delineated in Phase I as well as better definition of property standards.

Task 4.0 Survey of potential wood gasification applications in Georgia and practical test programs on gasifier operational problems.

Task 5.0 Technology-transfer through seminars, publications, tours, or demonstration sites, and presentations of national conferences.

Task 6.0 High technology wood energy research program devoted to applications for Georgia's industrial requirements.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

Task 4.4 - Modification of equipment delayed by late delivery of materials.
5.0 SUMMARY STATUS AND FORECAST

Activities for the month centered on the following:

Task 1.0 Has been completed.

Task 2.0 A visit was made by EES personnel to Gold Kist soy plant in Valdosta to meet with the boiler operators. The plant has begun burning peanut hulls for the first time. The temperatures in the cells increased to the point where the slag from the wood fuel was beginning to melt off the walls. To temporarily control this enormous heat increase, the peanut hulls were being watered down. The stack emissions have also changed since the burning of hulls. There is visible smoke coming from the stacks. Randy Young is in charge of the boiler operations and has begun collecting data on the fuel feed. However, he has not been collecting excess stack O2. He will get the equipment he needs to do this. The previous months of fuel consumption data was averaged from the purchasing data.

Task 3.0 J. Walsh attended the October meeting of ASTM Subcommittee E44.12 for Biomass Fuels in Philadelphia, PA. The negative votes against the moisture and volatile test standards were resolved and the standards for moisture, volatile content, bulk density of densified fuels and combustion characteristics of wood fuels are out for concurrent committee/subcommittee ballot. Approval of the standards as certified ASTM test procedures is expected by June 1982.

Approximately 6 pounds of wood sample were obtained from the wood storage area at Aragon, GA. These samples will be divided between the fuel labs at Georgia Tech and North Carolina State University. Approximately 30 moisture content and 30 volatile content tests will be conducted at each location, and a research report will be filed with ASTM. The purpose of these tests is to verify the precision and accuracy requirements of the standard regarding duplicate tests of the same sample in the same lab and between two labs.

Data reduction of samples obtained at Aragon continues. Significant drying of the uncovered piles has been observed due to a severe lack of rain in the area. Final samples and measurements will be made in early November.
Task 4.0 The final report on textile drying experiments was finished and printed this month. Copies have been sent to contacts in the textile and gasification industries.

Little work was performed on the gasification pilot plant this month. The steel work for the refractory furnace was completed with the installation of thermocouple parts and fabrication of plywood forms to contain the castable refractory. Work is held up due to continued delays in receiving the Babcock & Wilcox castable refractory. B&W claimed that this material was in stock and could be shipped in 2 weeks. They apparently ran out of it during the ordering process causing a 2-month delay. Delivery is currently forecast for mid-November, causing delays in completion of gasifier modifications.

Task 5.0 Work on the final report is 90% complete. Requests continue to be filled for various wood publications.

Task 6.0 Work on advanced wood fuel research continued with major efforts devoted to the use of wood for lime calcining. Other subjects investigated included applications for wood gasification.

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources

Attachments:

- Milestone Plan and Management Chart
<table>
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<tr>
<th>Identification Number</th>
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<td>(Site Visits) Review of Conversions</td>
<td>J</td>
<td>A</td>
<td>S</td>
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<td>2.6</td>
<td>Monitor Performance</td>
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<td>Disseminate Results</td>
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### Remarks

### Signature of Contractor's Project Manager and Date

### Signature of Government Technical Representative and Date
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<td>3.6 Interim Reports</td>
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### U.S. DEPARTMENT OF ENERGY

**MILESTONE SCHEDULE AND STATUS REPORT**

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1. **Contract Identification**
   - A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 4

2. **Reporting Period**
   - October 1 through October 31

3. **Contract Number**
   - DE-FG05-79ET23076 A001

4. **Contractor (name, address)**
   - Georgia Office of Energy Resources
   - 270 Washington Street, S.W.
   - Atlanta, Georgia 30334

5. **Contract Start Date**
   - April 15, 1980

6. **Contract Completion Date**
   - December 31, 1981

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<td>4.3 Design Test Program</td>
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<td>4.4 Modify Equipment</td>
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<td>4.6 Analyze Data</td>
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<td>4.7 Write Report</td>
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12. **Signature of Contractor's Project Manager and Date**

13. **Signature of Government Technical Representative and Date**
### A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 5

#### Contract Information
- **Contract Type:** Phase II, Task 5
- **Contract Number:** DE-FG05-79ET23076 A0Q1
- **Contract Start Date:** April 15, 1980
- **Contract Completion Date:** June 30, 1981

#### Contractor Information
- **Name:** Georgia Office of Energy Resources
- **Address:** 270 Washington Street, S.W., Atlanta, Georgia 30334
- **Contact:**
  - **Name:**
  - **Phone:**

#### Contract Information Number
- **Number:**

#### Work Breakdown

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A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 6

### 2. Reporting Period
through

### 3. Contract Number
DE-FG05-79ET23076 A001

### 4. Contractor (name, address)
Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

### 5. Contract Start Date
August 1, 1981

### 6. Contract Completion Date
December 31, 1981

### 7. Identification Number

### 8. Reporting Category (e.g., contract line number or work breakdown structure element)

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### 6.1 Develop Strategic Plans

### 6.2 Solicit Sponsors

### 6.3 Formulate Proposals

### 6.4 Submit Proposals

### 11. Remarks

### 12. Signature of Contractor's Project Manager and Date

### 13. Signature of Government Technical Representative and Date
December 16, 1981

Mr. Ed Bistany  
Georgia Office of Energy Resources  
270 Washington Street, S.W./Room 615  
Atlanta, GA. 30334

Dear Ed:

Enclosed please find two copies of our latest progress report. Work on the final report is progressing well and we should have copies to you in early January.

If you have any questions please call me at 894-3448.

Sincerely,

[Signature]  
William S. Bulpitt, Chief  
Wood Energy Systems Division

WSB/jh

Enclosures

cc: J.L. Birchfield  
R.S. Combes  
M.L. Brown  
D.E. Harris  
T.F. McGowan  
C.L. Aton  
J.L. Walsh  
Photo Lab (2)
MONTHLY STATUS REPORT

Date: 12/11/81
Period: 11/01/81 11/31/81

PROJECT

Title: A State Demonstration Program in Wood Energy-Phase II

CONTRACT:

Number: DE-FG05-79ET23076-A001
Start Date: 4/15/80
Completion Date: 12/31/81
Contractor: Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, GA 30334

1.0 CONTRACT OBJECTIVE

The objective of this project is to accelerate the commercialization of wood energy for nonforest industries in Georgia as a replacement for oil and gas fuels.

2.0 CONTRACT TASKS

Task 1.0 Development of a Wood Energy Extension Service to provide widespread technical assistance to industry and institutions. This assistance will take the form of handbook development, feasibility studies, and implementation assistance.

Task 2.0 This task will involve the continued supervision of the two demonstration projects begun under Phase I.

Task 3.0 In-depth analysis of specific problems in supply, storage, and drying of wood fuels delineated in Phase I as well as better definition of property standards.

Task 4.0 Survey of potential wood gasification applications in Georgia and practical test programs on gasifier operational problems.

Task 5.0 Technology-transfer through seminars, publications, tours, or demonstration sites, and presentations of national conferences.

Task 6.0 High technology wood energy research program devoted to applications for Georgia's industrial requirements.

3.0 TECHNICAL APPROACH OR WORK PLAN CHANGES

None to report during this period.

4.0 VARIANCES

Task 4.4 - Modification of equipment delayed by late delivery of materials.
5.0 SUMMARY STATUS AND FORECAST

Activities for the month centered on the following:

Task 1.0 has been completed.

Task 2.0 On November 12, David Harris visited with Randy Young, plant engineer for Gold Kist in Valdosta. The boiler was running well at the time. However, the week before this visit, the boiler was shut down due to high flue gas temperatures and low steam production. The problem was slag build-up in the superheat section of the boiler where the flue gas particles hit it before making a turn. This slag was broken off after the boiler shut down. The boiler was allowed to cool so that Gold Kist engineers could climb in it to inspect. They found that the steam nozzles which were designed to clean the boiler tubes were either covered with the original shipping cap an misaligned such that the steam did not hit the tubes. They immediately corrected the nozzles. If the problem occurs again, they will consider installing nozzles in the superheat section of the boiler. The hulls seem to contain more sand. Also, the flue gas is at a higher temperature due to the low moisture content of the hulls.

The present cost of wood fuel from Langdale is about $12/ton.

David Harris will be visiting Valdosta more frequently while he is finishing the report.

Task 3.0 Final measurements were taken from the storage piles at Aragon. Data is being reduced and analyzed and the final report has been started.

Four draft wood fuel standards have been released for simultaneous ASTM committee/subcommittee ballot. No problems with approval are expected and the standards should be submitted to the entire ASTM by February.

The initial drafts of the supply and drying reports have been started.
Task 4.0 - A final section on the current pilot plant work was written for the final report. It is in draft form and will be completed in December.

The Babcock and Wilcox castable refractory has not been received. An investigation of the delay has found that the raw material for the castable refractory is not available due to a competitor's take over of the manufacturing company. We are investigating alternative to this material; thermal and mechanical properties of any alternate will be of lower quality hence our reluctance to switch specifications.

Due to this shortage of material for lining the furnace, we have decided to finish mechanical re-assembly of the rest of the burner system and to perform a test run to check system operation. The gas chromatograph will be calibrated with prepared gases and used on-line to sample the producer gas as it is made. The effect of steam addition on gas composition will be assessed with the new gas chromatograph capabilities.

Task 6.0 - The effort directed toward wood fuel applications for lime calcining was largely completed last month. Preliminary investigations were begun on utilizing wood gas as a combustion turbine fuel. Other activities concentrated on wood fuel applications in non-metallic mineral industries.

Ed Bistany, Program Coordinator
Georgia Office of Energy Resources

Attachments:
- Milestone Plan and Management Chart
## A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 2

### 2. Reporting Period
- **November 1 through November 30**, 1980

### 4. Contractor (Name, Address)
- **Georgia Office of Energy Resources**
  - 270 Washington Street, S.W.
  - Atlanta, Georgia 30334

### 7. Identification Number
- **2.1 Select Demonstration Site**
- **2.2 Conceptual Designs**
- **2.3 Contract Document Prep**
- **2.4 Assist in Contractor Selection**
- **2.5 Review of Conversions**
- **2.6 Monitor Performance**
- **2.7 Analysis & Reporting**
- **2.8 Disseminate Results**

### 9. Fiscal Years and Months
- **FY80**
- **FY81**

### 10. Percent Complete

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<thead>
<tr>
<th>Month</th>
<th>FY80</th>
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<tr>
<td>Jan</td>
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### 11. Remarks

### 12. Signature of Contractor's Project Manager and Date

### 13. Signature of Government Technical Representative and Date
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<th>Task Description</th>
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<tr>
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<td>J</td>
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<td>3.2 Availability &amp; Costs</td>
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<td>3.3 Standards</td>
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<td>3.4 Storage</td>
<td>J</td>
<td>F</td>
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<td>3.5 Drying</td>
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<tr>
<td>3.6 Interim Reports</td>
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</table>
U.S. DEPARTMENT OF ENERGY
MILESTONE SCHEDULE AND STATUS REPORT

1. Contract Identification
A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 4

2. Reporting Period
November 1 through November 30

3. Contract Number
DE-FC05-79ET23076 A00

4. Contractor (name, address)
Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

5. Contract Start Date
April 15, 1980

6. Contract Completion Date
December 31, 1981

7. Identification Number

8. Reporting Category (e.g., contract line item or work breakdown structure element)

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<td>4.0</td>
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<tr>
<td>4.1</td>
<td>Redesign System</td>
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<td>4.2</td>
<td>Order Equipment</td>
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<td>4.3</td>
<td>Design Test Program</td>
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<tr>
<td>4.4</td>
<td>Modify Equipment</td>
<td></td>
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<tr>
<td>4.5</td>
<td>Perform Task</td>
<td></td>
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<tr>
<td>4.6</td>
<td>Analyze Data</td>
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<td>4.7</td>
<td>Write Report</td>
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9. Fiscal Years and Months

10. Percent Complete

11. Remarks

12. Signature of Contractor's Project Manager and Date

13. Signature of Government Technical Representative and Date
### U.S. DEPARTMENT OF ENERGY

**MILESTONE SCHEDULE AND STATUS REPORT**

1. **Contract Identification**
   - A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 5

2. **Reporting Period**
   - November 1 through November 30

3. **Contractor (name, address)**
   - Georgia Office of Energy Resources
   - 270 Washington Street, S.W.
   - Atlanta, Georgia 30334

4. **Reporting Category (e.g., contract line item or work breakdown structure element)**

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<th>FY81</th>
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<td>Seminars and Tours</td>
<td>J A S O N D</td>
<td>J F M A M J J A S O N D</td>
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<td>5.2</td>
<td>Publications and Development</td>
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<td>5.3</td>
<td>Scale Model</td>
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<td>5.4</td>
<td>Computer Analysis</td>
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</tbody>
</table>

5. **Fiscal Years and Months**
   - FY80: J A S O N D
   - FY81: J F M A M J J A S O N D

6. **Percent Complete**
   - Plan: 0%
   - Actual: 100%

7. **Remarks**

8. **Signature of Contractor's Project Manager and Date**

9. **Signature of Government Technical Representative and Date**
## MILESTONE SCHEDULE AND STATUS REPORT

### 1. Contract Identification
A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY -- Phase II, Task 6

### 2. Reporting Period
November 1 through November 30

### 3. Contract Number
DE-FG05-79ET23076 A001

### 4. Contractor (Name, address)
Georgia Office of Energy Resources
270 Washington Street, S.W.
Atlanta, Georgia 30334

### 5. Contract Start Date
August 1, 1981

### 6. Contract Completion Date
December 31, 1981

### 7. Identification Number

### 8. Reporting Category (e.g., contract line item or work breakdown structure element)

### 9. Fiscal Years and Months
FY81

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<th>A</th>
<th>S</th>
<th>O</th>
<th>N</th>
<th>D</th>
</tr>
</thead>
</table>

### 10. Percent Complete

#### a) Planned

#### b) Actual

### 11. Remarks

### 12. Signature of Contractor's Project Manager and Date

### 13. Signature of Government Technical Representative and Date
A STATE DEMONSTRATION PROGRAM IN WOOD ENERGY

Contract No. DE-FG05-79ET 23076

PROGRAM REVIEW
FEBRUARY 1980

Georgia Institute of Technology
Engineering Experiment Station
A STATE DEMONSTRATION PROGRAM
IN WOOD ENERGY

Program Review
February 1980

Granted by Department of Energy
to
Georgia Office of Energy Resources
and
Georgia Institute of Technology

Contract No. DE-FG02-79ET23076
SUMMARY

Work is proceeding smoothly and within budget on "A State Demonstration Program in Wood Energy." The objective, to stimulate the commercialization of wood energy in nonforest industries, is being met through four tasks:

- **Economic feasibility studies** for 14 potential wood energy users and 4 potential wood suppliers are being conducted in cooperation with the University of Georgia School of Agricultural Economics. Data has been collected for steam production or product drying at the poultry, textile, carpet, and numeral processing plants selected. Each of the 18 reports will contain individual design plans and economic analyses as well as background information on wood energy to meet the needs for general information on the use of wood as an alternate fuel.

- **Demonstration projects** at three North Georgia plant sites are currently in the design phase. All three companies meet the criteria of this program. Each is
  1) Representative of an important industrial sector in the state.
  2) Willing to operate as a public showcase.
  3) Able to provide the capital necessary to match DOE funds.

The project cost for all three installations is $2.2 million of which $438,000 is being provided under this grant.

- **Technology transfer** is required to overcome the lack-of-knowledge barrier to the commercialization of wood energy. Two seminars already held have attracted over 100 attendees representing 85 companies and agencies. An introductory booklet to industrial wood energy has been widely distributed throughout Georgia and the United States. Our activities have prompted requests for speakers on wood energy throughout the Southeast and for participation in conferences on alternate energy sources. Two more seminars are planned, and work continues on an educational slide and cassette tape series.

- **Wood fuels processing data** on the technical and economic aspects of energy wood is required to expedite the transition from petroleum fuels. For the first seminar, wood properties were compiled and published as a proceedings. Process routes from forest to energy consumer were then established, and a number of densification plants were visited. Cost and design data are now being organized into a reference manual.
Task 1
Feasibility Studies

The purpose of this task is to perform 18 supplier/user wood energy feasibility studies. There will be 4 supplier-directed studies and 14 user directed studies.

The present status of the work is that the candidates have been selected and the preparation of the studies is going forward.

The candidate sites were selected in accordance with the contract and involved the assistance and recommendations of the Georgia Poultry Federation, The Carpet and Rug Institute, The Georgia Textile Manufacturers Association, and The Georgia Forestry Association. (See Appendix A).

The industries selected are:

1) Fieldale Corporation
2) J.P. Stevens
3) Dundee Mills
4) Wayne Poultry
5) West Point Pepperell
6) Wellington Puritan Co.
7) Standard-Coosa-Thatcher
8) Gold Kist Inc.
9) Freeport Kaolin
10) Milliken Corporation
11) Oil-dri Corporation
12) Brown & Williamson Tobacco
13) Dan River
14) United Merchants

A more detailed presentation of these companies is made in Figure 1 including type of application, energy requirements, and oil and gas displacement. Most of the studies involve the production of steam with two directed at product drying of kaolin and Fuller's earth.
<table>
<thead>
<tr>
<th>Company</th>
<th>Application</th>
<th>Size</th>
<th>Wood Consumption</th>
<th>Displacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Fieldale Corporation</td>
<td>Boiler</td>
<td>650 hp</td>
<td>31,600</td>
<td>182,105 MCF gas, 91,345 gals oil</td>
</tr>
<tr>
<td>2) J.P. Stevens</td>
<td>Boiler</td>
<td>35,000</td>
<td>98,000</td>
<td>1,168,000 gals oil, 137,500 MCF gas</td>
</tr>
<tr>
<td>3) Dundee Mills</td>
<td>Boiler</td>
<td>200 hp</td>
<td>9,700</td>
<td>18,461 MCF Natural Gas, 12,779 gals No. 2 fuel oil</td>
</tr>
<tr>
<td>4) Wayne Poultry</td>
<td>Boiler</td>
<td>500 hp</td>
<td>24,200</td>
<td></td>
</tr>
<tr>
<td>5) West Point Pepperell</td>
<td>Boiler</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6) Wellington Puritan Co.</td>
<td>Boiler</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7) Standard-Coosa-Thatcher</td>
<td>Boiler</td>
<td>20,000</td>
<td>27,700</td>
<td>119,194 MCF gas, 275,000 gals oil</td>
</tr>
<tr>
<td>8) Gold Kist Inc.</td>
<td>Boiler</td>
<td>800 hp</td>
<td>38,800</td>
<td></td>
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<tr>
<td>9) Freeport Kaolin</td>
<td>Dryer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10) Milliken Corporation</td>
<td>Boiler</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11) Oil-Dri Corporation</td>
<td>Dryer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12) Brown &amp; Williamson Tobacco</td>
<td>Boiler</td>
<td>100,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13) Dan River</td>
<td>Boiler</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14) United Merchants</td>
<td>Boiler</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FIGURE 1. COMPANIES TO BE INVESTIGATED UNDER TASK 1.
The wood supply and wood fuel cost studies for users have been sub-contracted to the School of Agricultural Economics of the University of Georgia. They are also performing four wood supplier feasibility studies.

The first work for each study involves a plant visit by a team of Georgia Tech engineers of the Wood Energy Systems Branch. The purpose of these visits is to collect engineering data on the energy-consuming equipment, the plant operation, and current energy consumption. Physical dimensions of the existing plant are taken with particular attention to space availability for new equipment that may be required and for wood storage and handling. Special conditions such as plant location (rural or urban) and highway and rail access are noted. Advice of plant management is sought.

To assist in the data gathering, a standard form is utilized. An example is shown in Figure 2. Each plant site is then analyzed individually. Wood system design elements include boiler size and type, emission controls, wood procurement and on-site handling, ash handling, and personnel requirements. Construction costs for each element of the system are tabulated. A plot plan and boiler layout, shown in Figure 3, is drawn for each site.

All site-specific information will be published as separate reports for each company using the following format:

I. INTRODUCTION & BACKGROUND
II. RECOMMENDATIONS
III. AVAILABILITY OF WOOD FUEL
IV. ESTIMATED COST OF WOOD FUEL
V. SYSTEM DESIGN
VI. SYSTEM CONSTRUCTION COSTS
VII. ECONOMIC ANALYSIS
VIII. SPECIAL CONSIDERATIONS
IX. SAFETY AND ENVIRONMENTAL CONSIDERATIONS

An appendix to each report will include general information on emission control equipment, wood handling equipment, sample calculations, and safety and environmental aspects of using wood for energy.

Results of this task will be presented April 30, 1980 at the third seminar conducted under Task 3.
NAME OF COMPANY: J.P. Stevens Co.

PRODUCT LINE: Textile manufacturing - processing and finishing woolen fabrics

NUMBER OF EMPLOYEES: There are four boilers; three boilers are designed to burn coal and the other one burns on gas or oil. Two of the coal fired boilers are coverted to burn gas or oil and the remaining one is idle. The description of the boilers are as follows.

BOILER PLANT INFORMATION:

Boiler No. 1:

- Type Vu Combustion Engineering Co.
- Steam Generator
- Date of Installation: 1947
- Steam Capacity: 35,000 lb/hr
- Pressure: 163 psi
- Heating Surface (boiler): 4,475 ft²
- Heating Surface (water walls): 478 ft²
- Fuel: Coal

Emission Control: Steam jet ash recovery

Fuel Storage: Silo, approximately 15' dia. x 75' ht.

Boiler Efficiency: Not available

Boilers No. 2 & 3:

Specifications are the same as those of Boiler No. 1, but these have been converted to burn gas or oil.

Boiler Efficiency: 81% (Approximately)

Boiler No. 4:

- Combustion Engineering Co.
- Vertical Boiler
- Date of Installation: 1956
- Steam Capacity: 60,000 lb/hr
- Pressure: 250 psi

STEAM USAGE AND PLANT OPERATION:

- Steam is used for processing and space heating as follows.
  - Summer: 65,000-75,000 lb/hr of steam 24 hrs/day, 6 days/week, 6-7 months/year
  - Winter: 110,000-120,000 lb/hr, 24 hrs/day, 6½-7 days/week, 5-6 months/year

ENERGY CONSUMPTION:

- Natural Gas: 452,948,000 cu. ft.
- No. 6 Fuel Oil: 1,167,839 gallons

OTHER INFORMATION:

No. 1 coal fired boiler is remaining idle at the present time. The fuel handling system and storage (silo) that was designed for the three boilers, still exist. The company wants to burn wood on the third boiler.

FIGURE 2. SAMPLE FORMAT FOR DATA COLLECTION
FIGURE 3. SAMPLE PLOT PLAN AND BOILER LAYOUT FOR TASK 1
Task 2
Demonstration Projects

Even though feasibility studies show that wood can be an economic source of energy, nonforest industries may still hesitate to invest in wood systems. The objective of Task 2 is to demonstrate wood energy by installing and monitoring showcase systems in representative sectors of industry.

The DOE grant provides matching funds for three companies in an amount of up to 50% of the project but not to exceed $146,000. The Georgia Tech Engineering Experiment Station met with all interested parties and selected from them three qualified sites to participate in this project. The selection process proceeded as shown in the flow chart below:

A summary of the three chosen sites is given in Figure 4.

The initial phase of the selection process was to inform potential demonstration candidates of the program's existence. A letter was sent to each of the state's largest trade associations describing the program—The Georgia Textile Manufacturers Association, The Georgia Poultry Federation, and The Carpet and Rug Institute.
### Integrated Products

<table>
<thead>
<tr>
<th>Location</th>
<th>Boiler Capacity</th>
<th>Total Budget</th>
<th>Daily Wood Consumption</th>
<th>Construction Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chipman Union</td>
<td>15,000 lb/hr</td>
<td>$400,000</td>
<td>72 tons</td>
<td>39 weeks</td>
</tr>
<tr>
<td>Galaxy Carpet</td>
<td>50,000 lb/hr</td>
<td>$1.4 million</td>
<td>45 tons</td>
<td>42 weeks</td>
</tr>
<tr>
<td>Integrated Products</td>
<td>15,750 lb/hr</td>
<td>$400,000</td>
<td>75 tons</td>
<td>39 weeks</td>
</tr>
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</table>

**Figure 4. Demonstration Sites Under Task 2**
As a result of this query, a preliminary list of 14 sites was established:

<table>
<thead>
<tr>
<th>Company</th>
<th>Product</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Chicopee Manufacturing</td>
<td>Textiles</td>
<td>Gainesville, GA</td>
</tr>
<tr>
<td>2. Con-Agra</td>
<td>Poultry</td>
<td>Dalton, GA</td>
</tr>
<tr>
<td>3. Fieldale Poultry</td>
<td>Poultry</td>
<td>Cornelia, GA</td>
</tr>
<tr>
<td>4. Wayne Poultry</td>
<td>Poultry</td>
<td>Pendergrass, GA</td>
</tr>
<tr>
<td>5. Wellington Puritan Mills</td>
<td>Textiles</td>
<td>Eatonton, GA</td>
</tr>
<tr>
<td>6. Gold Kist, Inc.</td>
<td>Poultry</td>
<td>Ballground, GA</td>
</tr>
<tr>
<td>7. Standard-Coosa-Thatcher</td>
<td>Textiles</td>
<td>Washington, GA</td>
</tr>
<tr>
<td>8. Integrated Products</td>
<td>Textiles</td>
<td>Aragon, GA</td>
</tr>
<tr>
<td>9. Wrigley's</td>
<td>Chewing Gum</td>
<td>Gainesville, GA</td>
</tr>
<tr>
<td>10. Graniteville Co.</td>
<td>Textiles</td>
<td>Augusta, GA</td>
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<tr>
<td>11. Bigelow Sanford</td>
<td>Carpet</td>
<td>Summerville, GA</td>
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<tr>
<td>12. Galaxy Carpet</td>
<td>Carpet</td>
<td>Dalton, GA</td>
</tr>
<tr>
<td>13. Chipman Union</td>
<td>Textiles</td>
<td>Unions Point, GA</td>
</tr>
<tr>
<td>14. West Point Pepperell</td>
<td>Textiles</td>
<td>Rome, GA</td>
</tr>
</tbody>
</table>

All of the above companies were contacted by phone and introduced to the program. After initial contact, three companies stated that they could not pursue the program. Con Agra was building a hatchery but did not plan to install a boiler. Bigelow-Sanford uses coal as fuel and felt they could remain in compliance with emission restrictions. Further, they had tested wood pellets previously with limited success. Graniteville Co. was interested in the program, but due to their location in downtown Augusta, they felt wood pellets was the only fuel for which they could provide adequate storage.

The remaining candidates were visited by Georgia Tech personnel between July and October 1979. Each expressed interest during the visit and agreed to the matching fund provision of the contract as well as the stipulation that the demonstration site be made available as a "showcase" for interested parties. However, when the total cost of such a project was explained and understood, three more companies asked to be removed from consideration. Wayne Poultry Co. had no capital available for
expansion. Chicopee Mfg. Co. had committed its available capital to re-organization. Standard-Coosa-Thatcher Co. has two package boilers that were installed in 1970. They were not interested in replacement at this time, nor were they interested in purchasing a new wood fueled boiler while putting one or both of the existing boilers on standby. It would not be practical to convert one of the package boilers to wood. Companies still interested after the initial visit and a summary of their future plans are listed in Appendix B.

Following the completion of the initial visits to all locations, a preliminary selection meeting was held October 23, 1979. After looking over the results of the visits, we eliminated four companies for the following reasons:

1. West Point Pepperell dropped from consideration due to the questionable economics of replacing coal and the huge capital involved in converting such a large boiler.
2. Fieldale Corp. eliminated because of their timetable. We are unable to wait until June 1980 to begin the project.
3. Gold Kist (Ellijay) eliminated because of their low steam demands which would make payback longer and their feeling that Ballground is a better choice.
4. Galaxy Carpet - Both plants were discussed as sites for wood projects. Galaxy decided to look at the economics of each location and determine the most feasible choice.

The six final candidates that remained were:

1. Wrigley's, Gainesville
2. Gold Kist, Ballground
3. Puritan Mills, Eatonton
4. Chipman Union, Union Point
5. Galaxy Carpet, Chatsworth or Dalton
6. Integrated Products, Aragon

The results of the plant visits to these six were presented to the Office of Contract Administration (OCA), which handles the legal aspect of Georgia Tech's research contracts. Their responsibility in this program was (1) to assure the selection process was carried out equitably
and (2) to handle the legal aspects of the sub-contract drawn between Georgia Tech and the selected sites. Each remaining candidate was asked to submit a proposal describing the planned wood facility and to review a preliminary sub-contract. Three companies asked to be removed from consideration. Wrigley's reviewed the contract and found several areas to their dislike. Wellington Puritan was having problems with their industrial process at Eatonton and could not adequately determine their boiler size requirements. Gold Kist outlined their plans for a wood system at Ballground. However, since their 1980 budget would not be approved until mid-February, they are unable to actively enter into an agreement at present.

Chipman-Union, Galaxy, and Integrated Products all submitted proposed wood energy systems for review. Integrated Products and Chipman Union were firmly committed to burning wood; however, the Galaxy proposal hedged on a firm commitment to burn wood. They mentioned burning a coal/wood mixture. On January 21, 1980, Galaxy gave a firm commitment that if selected as a demonstration site, Galaxy would burn at least 50% wood for six months after startup. Thus the three sites selected were:

1. Galaxy Carpet, Dalton
2. Integrated Products, Aragon
3. Chipman Union, Union Point

At this point, Georgia Tech personnel are working closely with each plant and their architect/engineers in designing optimum systems. Initial vendor contacts have been made and it is expected that construction will begin in the spring. Each plant will receive the maximum contribution possible, or approximately $146,000.
Task 3

Technology Transfer

One of the barriers to the commercialization of wood energy is the lack of knowledge; few nonforest industries realize that wood is indeed a viable alternate energy source in Georgia and in other heavily forested states. The objective of this task is to educate these industries on the use of wood fuel as well as to present the results of the other three tasks under this state demonstration program. There are three areas included under this task:

1. Seminars
2. Publications
3. Audio-visuals

Seminars

Two seminars have already been held:

Wood As An Industrial Fuel on October 31, 1979
Safe and Clean Wood Energy on January 31, 1980

The first seminar featured speakers from Georgia Tech on the following topics:
- Physical Properties
- Processing Methods and Equipment
- Storage and Handling
- Matching Fuel to Combustion Equipment
- Combustion of Wood

Also, Fred Allen of the Georgia Forestry Commission spoke on wood availability in the Southeast.

The seminar was attended by 75 people from forest and nonforest products industries, utilities, consulting firms, government agencies, and equipment manufacturers. A total of 50 companies were represented.
Speakers at the second seminar were from outside agencies as well as from Georgia Tech. Topics covered and speaker affiliations were:

- Environmental Effects of Harvesting  
  U.S. Forest Service
- Safe Wood Storage  
  Champion Papers Co.
- Health and Safety Requirements  
  Georgia Tech
- Safety Aspects of Combustion Equipment  
  Georgia Tech
- Pollution Control Equipment  
  Georgia Tech
- Ash Disposal Methods  
  Georgia Department of Natural Resources
- Emission Regulations  
  Georgia Department of Natural Resources

Number of registrants at this seminar totalled 47 representing 41 companies of which 6 were repeats from the first seminar.

A third seminar is currently being planned for April 30, 1980. Speakers will be from Georgia Tech and from the University of Georgia covering topics that were researched under Task 1:

- Fuel Supply
- Fuel Handling Systems
- Combustion System Design
- Fuel Delivery Costs
- Wood Energy System Costs
- Economic Analysis Methodology

Since economics is the most basic reason for switching from oil and gas, the seminar is expected to be well attended by both in-state and out-of-state industry and government representatives.

A fourth seminar will be conducted in late spring on wood combustion processes and equipment.
Publications

Wood: An Alternate Energy Resource is an introduction to the use of wood fuel in nonforest products industries. It is a 12-page booklet designed to set the stage for our more detailed seminars. Energy offices from 15 of the 50 states have acknowledge receipt of the booklet. Some sent their own publications; others requested copies of the book for their staff or for others interested in wood energy. Copies are also being distributed by Georgia Tech's field offices and the Georgia Office of Energy Resources.

A proceedings for each seminar is also published. These are handed out to seminar attendees and sent to other interested parties around the country. Florida, California, and the New England Regional Commission have especially shown interest in our wood energy program.

The research work performed under Task 4 will be compiled into a reference handbook detailing technical and economic data on various wood fuels and their processing routes.

Audio-Visuales

In keeping with the education objective of this task, three audio-visual programs are being compiled. These are 15-minute slide shows with accompanying scripts and tape cassettes. The first is a general introduction to wood energy that can be presented at business luncheons and trade association meetings. The other two will be more technical in nature covering wood fuel properties and equipment systems. Plant managers who plan to convert to wood energy can use these programs to acquaint their personnel with the special considerations needed in wood fuel systems.
Task 4

Wood Fuels Supply and Processing Methodology

The nonforest products industries in Georgia are very interested in switching from oil and gas to cheaper and more available fuels. Although interest is high, the transition to wood fuel has been hampered by lack of economic and technical data on the competing wood fuels and the equipment needed to use them. The objective of Task 4 is to produce this data base.

Work Completed

Collection of technical and economic data was the first task to be carried out on this project. Technical data was collected on wood fuels through literature searches and lab tests performed at our facility. A report on the properties of wood fuel was issued on October 31, 1979, and was the basis for our first seminar (presented under Task 3) entitled "Wood as an Industrial Fuel." This report included data on physical and chemical properties, typical lab analysis, moisture content, ash analysis, theoretical flame temperatures, and data on low Btu gas from wood gasifiers. Other topics covered were storage, handling, densification, and combustion of wood.

Many trips were made to woodburning and wood processing facilities. Densification plants and equipment manufacturers visited were:

<table>
<thead>
<tr>
<th>Company</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>TransArctic Air Ltd.</td>
<td>Vancouver, B.C.</td>
</tr>
<tr>
<td>Woodex</td>
<td>Brownsville, OR</td>
</tr>
<tr>
<td>Woodex</td>
<td>Knoxville, TN</td>
</tr>
<tr>
<td>Woodex</td>
<td>Goldston, NC</td>
</tr>
<tr>
<td>Woodex</td>
<td>Clio, AL</td>
</tr>
<tr>
<td>Papakube</td>
<td>San Diego, CA</td>
</tr>
<tr>
<td>California Pellet Mill</td>
<td>San Francisco, CA</td>
</tr>
<tr>
<td>California Pellet Mill</td>
<td>Sparks, NV</td>
</tr>
</tbody>
</table>

Wood fired boiler and electric generating plants were visited in Eugene, Oregon (Eugene Water and Electric Board) and Alexander City, Alabama (Russell Mills).
We also attended an ASTM conference on standards for testing and commodity specification of wood fuels in Lake Tahoe, Nevada, and opening ceremonies of Woodex licensees for Florida, Tennessee, and North Carolina. A Tech representative was sent to a meeting on drying and densification in Raleigh, N.C. (NC State) presented by Sprout-Waldron and Aeroglide representatives. A recent meeting of the FPRS in Atlanta was an excellent source of data from vendors on equipment cost and applications.

Final Report

The final report will be written from the industrial user’s point of view. The report is broken down into technical and economic sections which are the elements of different processing routes. (See Figure 5). A process route may start with the purchase of whole tree chips. Additional equipment is added to unload, transfer, store, and burn the wood fuel. A more complex route would include drying and densification or gasification of the wood prior to combustion. Each process has a different combination of capital, operating, and fuel costs. These are analyzed and produce a total cost per million Btu's delivered to the user's plant. We have used this system to complete preliminary economic comparisons on 20,000 lb/hr capacity steam boilers. The results are shown below:

<table>
<thead>
<tr>
<th>Combustion System</th>
<th>Cost per million Btu's delivered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood boiler using wood waste</td>
<td>$3.70</td>
</tr>
<tr>
<td>Wood boiler using wood pellets</td>
<td>$4.00</td>
</tr>
<tr>
<td>No. 6 oil package boiler</td>
<td>$5.50</td>
</tr>
<tr>
<td>Natural gas package boiler</td>
<td>$4.00</td>
</tr>
</tbody>
</table>

The tentative index for the project report follows:

I. Introduction
II. Wood Fuel Properties
III. Wood Fuel Cost and Supply
IV. Size Reduction
VI. Drying
VII. Densification
FIGURE 5. A SAMPLE PROCESS DIAGRAM

Process Diagram
Alabama Woodex Pellet Plant - Clio, Alabama

Receive Wood by Truck → Wood Pile → Front End Loader

Feed Bin w/Dumper and Drag Internal Chain → Disc Screen

Pneumatic Conveyor → Hammer Mill → Screw Conveyor

Tramp Material Removed Manually

Belt Conveyor → Rotary Dryer → Pneumatic Conveyor

Hammer Mill → Pneumatic Conveyor → Pellet Mill Feed Bin

Metering Screw Conveyor → Pellet Mill → Vibrating Conveyor/Screen

Bucket Conveyor → Vibrating Screen Pellet Cooler → Bin with Vibrating Feeder → Vibrating Conveyor

Bucket Conveyor → Rotating 4-Way Distributor → Storage Silos(4)

Chain Paddle & Bucket Elevator → Truck Loading Silo → Ship by Truck
The sections on wood fuel properties and cost and supply are complete in rough form. We have compiled data on the remainder and have made substantial progress in writing subsections.

Our remaining work under this task is participation in the fourth seminar to be presented under Task 3 and completion of the final project report.
APPENDIX A

Sample Communications
with Companies and Trade Associations on Task 1
MEMORANDUM

TO: GFA Energy Committee Members

FROM: Bill Bulpitt, Grant Curtis (894-3589)

SUBJECT: Potential Suppliers of Energy Wood

As part of a new project in wood energy sponsored by the Department of Energy, Georgia Tech personnel will be performing preliminary wood energy feasibility studies for selected industrial plants in Georgia. In addition, one or more wood suppliers will be assisted in attempting to find a market for energy wood (sawmill residue, harvesting residue, total tree chips). If any of the committee members know of a likely candidate who might benefit from such a program please call Grant Curtis at the above number.

WSB,GBC:dm
June 26, 1979

IMPORTANT

To: Chief Executives In Georgia,
    Georgia Textile Companies

Subject: Wood Energy Feasibility Studies

Gentlemen:

If you would like for your company to be one of eighteen Georgia industries to be a candidate for a feasibility study for the consideration of the substitution of wood for oil and gas fuel, please read the attached announcement, and make the contact as suggested.

Applications now are being accepted for the program, to be conducted by the Georgia Tech Engineering Experiment Station under the sponsorship of the Georgia Office of Energy Resources.

Georgia Tech has asked that we call this to the attention of our members, and if you have any interest, we suggest that you act promptly.

Cordially yours,

Executive Vice President

FLC:j
Enclosure
cc: Public Utility Rate & Energy Committee
October 2, 1979

Mr. Grant B. Curtis, Jr.
Engineering Experiment Station
Georgia Institute of Technology
225 North Ave., N.W.
Atlanta, Georgia 30332

Dear Mr. Curtis:

As a follow-up to our previous conservations, we would like to participate in the "State Demonstration Program in Wood Energy."

We have a manufacturing facility in Macon, Georgia that will be expanded over the next several years. Presently, we employ approximately 900 in the Macon area and anticipate this number to at least double in the mid-1980's. Along with this expansion will be the addition of boilers to provide the steam necessary to support increased production. Needless to say, future availability of boiler fuels is of prime concern.

We have no experience with wood as a boiler fuel and need your assistance to determine whether or not future boilers should be designed for wood firing. Such a determination would depend upon present and future availability of wood as a boiler fuel, environmental considerations, and the economics of using this fuel along with other considerations outlined in your program.

Undoubtedly, each wood energy feasibility study conducted under your program will be site specific. We look forward to the opportunity of working with you and your staff at our site in Macon.

We would like to participate in your program and request that you inform us if there is additional information required from us at this time. Also, we would appreciate you informing us at your earliest convenience whether or not we will have an opportunity to participate in the "State Demonstration Program in Wood Energy."

Yours very truly,

[Signature]
Manager, Environmental & Energy Engineering
August 23, 1979

Mr. Grant Curtis
Engineering Experiment Station
Georgia Institute of Technology
305 Baker Building
Atlanta, Georgia 30332

Dear Mr. Curtis:

Mr. John Williamson, President of Freeport Kaolin Company, has asked the FKC Engineering Department to make a feasibility study on generating steam for process heating and producing electricity. I would like for your group to include Freeport Kaolin in your Federal Wood Project.

After our telephone conversation this morning, I feel that Freeport would be an excellent candidate for the Wood Project. Our steam load is approximately 40,000 lbs./hr. at 75 PSI and the associated equipment has approximately a 600 KW load. Our average plant load is 8000 KWH/Mo. with a peak demand of 12,000 KWH. There are several good sources of wood chips in our immediate area and we have a large supply of non-merchantable timber on company owned property. Also, we have a large area with good truck and rail access for chip storage. This area is large enough and very close to the process steam use point making it a good location for the boiler.

Thank you for considering Freeport Kaolin Company in your Federal Wood Project and I am looking forward to starting this study soon.

Yours truly,

Frank R. Eady
Engineer
Freeport Kaolin Company

C: Fuel - Chip Fired
Boiler Study

FRE:jh
22 June 1979

Mr. Abit Massey  
The Georgia Poultry Federation  
P. O. Box 763  
Gainesville, Georgia 30501

Re: Wood Energy Demonstration Project

Dear Mr. Massey:

Enclosed is the information letter on the eighteen feasibility studies which are to be provided under our "State Demonstration Program in Wood Energy." Your assistance in providing candidate plants is appreciated.

We would like to begin the initial selection of plants within 30 days and complete the process by the end of September.

Yours very truly,

Grant B. Curtis  
Senior Research Engineer

GBC:dm

Enclosure
Mr. Grant Curtis  
Engineering Experiment Station  
Georgia Institute of Technology  
225 North Avenue, NW  
Atlanta, Georgia 30332  

Dear Mr. Curtis:

This is to advise that the Woolen & Womenswear Division of J. P. Stevens & Co., Inc., would like to participate in the feasibility studies for substitution of wood for oil and gas fuel. We are presently operating five (5) plants in Georgia, with two in South Carolina as a part of this Division, with headquarters in Dublin, Georgia.

Our contact in this effort is Mr. Carl S. Williams, Manager of Engineering, Woolen & Womenswear Division, J. P. Stevens & Co., Inc., P. O. Box 1049, Dublin, Georgia 31021. He will be looking forward to hearing from you at an early date.

Sincerely yours,

DCJ:jjt

CC: Mr. Frank L. Carter  
    Mr. H. C. Walker  
    Mr. C. D. Willard  
    Mr. C. S. Williams
July 31, 1979

Mr. Grant Curtis
Engineering Experimental Station
Ga. Institute of Technology
225 North Ave., N.W.
Atlanta, Ga. 30332

Dear Mr. Curtis:

We are very much interested in the Wood Energy Feasibility Studies that your department will be handling. Any information that you can send us would be appreciated. Listed below is data about our present system:

One (1) 60,000 #/Hr. Boiler - #6 Fuel Oil - Natural Gas
Two (2) 35,000 #/Hr. Boilers - #6 Fuel Oil - Natural Gas
One (1) 35,000 #/Hr. Boiler - In Storage - Was never converted from Coal.

Thank you for your interest and we will be looking forward to hearing from you.

Sincerely,
J. P. Stevens & Co., Inc.

Jerry L. Mobley
Engineering Dept.

JLM/1sg
November 30, 1979

Mr. Grant Curtis  
Georgia Tech  
Engineering Experiment Station  
Atlanta, Georgia  30332

Dear Mr. Curtis:

Pursuant to our conversation, I am requesting a list of potentially large users of wood for fuel.  

Owners of timber land have asked me to arrange for wood to be supplied from their property.  

Thank you for your help in this matter.

Best regards,

Ed Bryant  
JEB/dgh
Dear Bill:

Thank you, and Grant and Bo for coming to Rabun, Friday, 26 January 1979.

As we stated to you, we are very interested in installing a wood burning boiler at Rabun Plant. We do need assistance in determining the availability of wood fuel to our location.

Please include Rabun Plant as one of the eighteen (18) sites that you intend to survey for the availability of wood fuel. We feel that our potential is as good or better than anyone else's in Georgia, and would be eager to learn the results of your study.

Sincerely yours,

BURLINGTON INDUSTRIES, INC.

(Jay R. Maveety  
Environmental Engineer)

JRM/dn

CC: Doug Adams - Rabun
August 29, 1979

Georgia Institute of Technology  
Engineering Experiment Station  
225 North Avenue, N.W.  
Atlanta, GA 30332

Attention: Mr. Grant Curtis

SUBJECT: WOOD ENERGY FEASIBILITY STUDY

Gentlemen:

Confirming our telephone conversation, we would like to participate  
in your wood Energy Feasibility Study.

We have one plant in Elberton, Georgia with a Superior Water Tube  
20,000# Boiler, at the present time operating with #5 fuel oil or  
natural gas. This was previously a coal burning unit. The oil  
consumption for the last calendar year was 33,000 gallons and the  
natural was 52.0 million cubic feet.

We also have a plant in Clarkesville, Georgia with two Cleaver  
Brooks Fire Tube 8600# Boilers consuming 111,000 gallons of #5  
oil and 28.0 million CF of natural gas for the same period.

Sincerely yours,

Walter E. Palmer

WEP/ele
APPENDIX B

Summary of Demonstration Candidates
Summary of Demonstration Candidates
before Final Selection

1. Chipman Union: Interested in working with us, recently decided to put in new boiler.

2. Fieldale Corp.: Visited plant in Cornelia where package boilers are installed and are not interested in new boiler. Are planning new plant for near Toccoa, but plans not finished till June 1980.


4. Gold Kist (Ballground): Are expanding capacity of boilers at chicken rendering plant, but money may not be approved for this fiscal year.
Gold Kist (Ellijay): Not as good a site as Ballground, steam demands not as high.

5. Integrated Products: Are considering a tri-fuel boiler. Good application.

6. Puritan Mills: Are renovating old plant with coal boiler (underfeed stoker). Have talked to consultant and he mentioned installing pellet operation for this mill or a fluid bed in Madison plant.

7. West Point Pepperell: Have large coal fired boiler which would be difficult to justify economically because of low cost of coal.

8. Wrigley's: They are interested in working with us, are considering a new boiler, and want to consider a fluid bed to use their waste.