TO: Members of the Board of Trustees

FROM: Linda Flaherty-Goldsmith  
Vice President and Chief Operating Officer  
Lorraine M. Aronson  
Vice President and Chief Financial Officer

RE: Approval of Revised Budget and Funding Plan for the Heating Plant - Upgrade

RECOMMENDATION:

That the Board of Trustees approve the attached resolution providing for a revised budget of $81.9 million for the cogeneration plant project and the associated change to the lease-purchase agreement.

BACKGROUND:

As you may recall from discussions leading to Board approval of this project at its May 7, 2003 meeting, the cogeneration plant is a major component of the University’s efforts to maximize energy efficiency. UConn is constructing this plant as a cost avoidance strategy in a climate of spiraling energy costs. The cogeneration facility is more efficient than other utility plants supplying power to New England because it produces both steam and electricity. This allows the plant to utilize more of the energy released during combustion. The estimated net present value of cost avoided by the construction of this plant is $79.9 million, which is $13.2 million higher than the 2002 estimate. In undiscounted dollars, the cost avoidance is $187 million. Savings will increase after lease payments expire in 20 years. The project will also increase the reliability of campus utilities, and lower emissions.

The complexity of the environmental analysis delayed the air permitting process causing the overall construction period to be extended by four months at a cost of $1.8 million. The exhaust stacks on the existing power plant were unsound; one stack had to be rebuilt and the other demolished at a cost of $1 million. Capitalizing interest expense during the construction period is an economically advantageous decision even though it increases the project cost by $3 million. Inflationary costs of $2.3 million were largely offset by a decision to purchase transportation service on a dedicated line from Connecticut Natural Gas rather than constructing .
the connection previously budgeted at $1.9 million. Finally, the project contingency is being increased by $700,000 to cover unforeseen issues that may arise prior to going live. Total authorization requested for the project is hereby increased from $75 million to $81.9 million.

Caterpillar Financial has agreed to the proposed increase in funding of the lease-purchase agreement to finance the project. The interest rate for the combined financing for the 20 year period is a very favorable 4.5%. Although not financed by UCONN 2000 dollars, the project is a named project (Heating Plant Upgrade) on the law’s project list. As we advised you when this was discussed at the May 7, 2003 meeting, in keeping with the advice of bond counsel, this financing for a project authorized by UCONN 2000 requires Board of Trustees approval equivalent to that exercised over bond issues.
RESOLUTION AUTHORIZING AN INCREASE OF $6,900,000
FOR THE COST OF THE HEATING PLANT UPGRADE AND AN
AMENDMENT TO THE LEASE PURCHASE AGREEMENT
TO FINANCE SUCH INCREASE

WHEREAS, on May 7, 2003, the board of trustees adopted a resolution to authorize a
$75,000,000 lease-purchase agreement to finance the heating plant upgrade (the “Lease”); and

WHEREAS, on May 15, 2003, such resolution was sent to the governor for his approval
and was deemed approved on June 14, 2003; and

WHEREAS, on December 18, 2003, the University of Connecticut (the “University”) entered into the Lease with Caterpillar Financial Services Corporation; and

WHEREAS, the cost of the heating plant upgrade (the “Project”) has been increased to
$81,900,000; and

WHEREAS, the University desires to amend the Lease to finance the increase in the cost
of the Project.

NOW THEREFORE, be it resolved by the board of trustees of the University as follows:

Section 1. The increase in the cost for the Project is hereby approved.

Section 2. An amendment to the Lease to increase the maximum principal amount of
the Lease from $75,000,000 to $81,900,000 (the “Amendment”) is hereby authorized to finance
the increase in the cost of the Project. The rent and other payment obligations of the University
under the Amendment shall be a general obligation of the University and the full faith and credit
of the University is hereby pledged to such payments subject to the existing rights of the
University’s bondholders. The Lease shall be payable out of any revenues or other assets,
receipts, funds or moneys of the University and may be additionally secured by a pledge of
revenues to be derived from the operation of the Project, by assured revenues and by other assets
other than a mortgage, subject only to any agreements with the holders of any other securities
pledging any particular assets, revenues, receipts, funds or moneys.

Section 3. The Amendment shall be dated and shall have a term not longer than thirty
years from the dated date of the Lease, shall carry such interest rate or rates payable at least
semiannually as, the Treasurer of the State (the “Treasurer”) in conjunction with the President or
Vice President and Chief Financial Officer of the University (the “Authorized Officers”) shall
determine is in the best interests of the State and University.
Section 4. The determination of the principal amount of the various rent payments under the Amendment, the term of the Amendment, rental payment dates and amounts, interest rate, terms, form and other details of the Amendment, is hereby delegated to be determined by certificates of the Authorized Officers and the Treasurer in accordance with The University of Connecticut 2000 Act, as amended (the “Act”), such principal amount, rental payment dates and amounts, interest rate, terms, form and other details to be conclusively evidenced by the execution and delivery of the Amendment and a certificate of determination of the Treasurer which shall be filed with the University and the Secretary of the State Bond Commission on or before the date of delivery of the Amendment, or any participations or interests therein, setting forth the details and particulars of the Amendment determined by her in accordance herewith.

Section 5. The Treasurer is further authorized, pursuant to the Act and pursuant to certain provisions of the General Statutes of the State of Connecticut, as amended, the authority to enter into agreements in consultation with an Authorized Officer with respect to the issuance and sale of the Amendment, or any participations or any interests therein, including financial advisory agreements, purchase agreements and investment agreements.

Section 6. The Amendment shall be executed and attested to by the signatures of the Authorized Officers and authenticated manually in accordance with the provisions of the Act and the Connecticut General Statutes.

Section 7. The Treasurer and the Authorized Officers of the University and each of them, are hereby authorized to perform all acts and execute any agreements, instruments and documents which are necessary or appropriate in connection with the execution and delivery of the Amendment, or any participations or interests therein, provided that the proceeds from the Amendment are used for the Project, including distributing an offering statement and entering into continuing disclosure agreements pursuant to the Securities and Exchange Commission Rule 15(c)(2)(12), if necessary, and executing and delivering any acceptance certificates, escrow agreements and related documents.

Section 8. In order to maintain the exclusion from gross income for purposes of federal income taxation of interest on the Lease and the Amendment, the University hereby covenants to comply with the provisions of the Code, and any regulations or rulings issued thereunder, applicable to the Lease or the Amendment. Further, the University covenants that it will not take any action or fail to take any action that would cause the Lease or the Amendment to be "arbitrage bonds" within the meaning of Section 148(a) of the Code. In fulfilling the covenants set forth in this Section, the University hereby agrees to instruct all parties acting by or on behalf of the University or in any manner with respect to the Lease and the Amendment regarding all acts necessary to satisfy and fulfill such covenants. The Treasurer and the Authorized Officers, and each of them, are authorized to bind the University pursuant to such representations and covenants as each of them deem necessary or advisable in order to maintain the continued exemption from federal income taxation of interest on the Lease and the Amendment, including covenants to pay rebates of investment earnings to the United States in future years.
Section 9. The Treasurer and the Authorized Officers, and each of them, hereby is authorized to provide for the security and payment of the Amendment and for the rights of the holders of the Amendment, or any participations or interests therein, to secure such obligations, pledge security and execute such security agreements, reimbursement agreements, instruments, opinions, certificates, affidavits and other documents and to do or cause to be done any and all other acts and things necessary, advisable or proper for carrying out this resolution, the terms, obligations and/or security of the Lease and the Amendment, and the implementation of the Project.

Section 10. The University reasonably expects to incur expenditures (the “Expenditures”) in connection with the capital Project for which a general functional description is provided above. The University reasonably expects to reimburse itself for the costs of the expenditures with the proceeds of the obligations of the University described above. The maximum principal amount of such debt to be issued as a tax-exempt obligation is not expected to exceed $81,900,000 ($75,000,000 previously authorized plus the amount authorized by this resolution). This declaration of official intent is a declaration of official intent made pursuant to Treasury Regulation Section 1.150-2.

Section 11. An Authorized Officer shall cause this resolution of the Board of Trustees approving the Amendment to be submitted to the Governor for her approval in accordance with Section 10a-109f of the Act.
University of Connecticut  
Vice Chancellor for Business and Administration

TO: Members of the Board of Trustees
FROM: Dale M. Dreyfuss, Vice Chancellor for Business and Administration
SUBJECT: RESOLUTION OF THE BOARD OF TRUSTEES AUTHORIZING A $75,000,000 LEASE-PURCHASE AGREEMENT TO FINANCE THE HEATING PLANT UPGRADE

RECOMMENDATION:

That the Board of Trustees approve the attached resolution providing for financing for a cogeneration project in the amount of $75 million, which amount shall constitute a general obligation of the University.

BACKGROUND:

Under the authority of UCONN 2000 to manage all its construction projects, the University will build a 25 megawatt electrical generation facility, the waste heat from which will be captured and employed to produce most of the heating needs and over 50% of the cooling demand at the Storrs campus. Electrical capacity of the plant will satisfy over 90% of campus peak requirements. Energy savings from the plant's combined - heat - and - power cycle are projected in excess of amounts needed to retire the debt. Total project financing will be provided by Caterpillar Financial, an arm of Caterpillar, parent company of the producer of the turbines to be used.

Bond counsel has advised that this financing for a project under the authority of UCONN 2000 requires Board approval equivalent to that exercised over bond issues.

DMD/dc

Attachment

Equal Opportunity Employer

352 Mansfield Road, U-72
Storrs, Connecticut 06269-2072
Telephone: (860) 486-4340
Facsimile: (860) 486-1070
RESOLUTION OF THE BOARD OF TRUSTEES
AUTHORIZING
A $75,000,000 LEASE-PURCHASE AGREEMENT
TO FINANCE THE HEATING PLANT UPGRADE

WHEREAS, The University of Connecticut 2000 Act, Sections 10a-109a to 10a-109y inclusive of the General Statutes of Connecticut, as amended (the "Act"), declares the purpose of the Act is to promote the welfare and prosperity of the people of the State and the continuation and improvement of their educational opportunities by approving a special capital improvement program for the University of Connecticut (the "University") and enabling the University to borrow money and enter into financing transactions in its own name, on behalf of the State, to expand the authority of the University to construct projects and to assure State support for the financing of the acquisition, construction, reconstruction, improvement and equipping of facilities, structures and related systems for the benefit of the educational and economic development needs of the State and the University, all to the public benefit and good, and the exercise of the powers, to the extent and in the manner provided in the Act, which the Act declared to be for a public purpose and to be the exercise of an essential governmental function; and

WHEREAS, the University is empowered by Section 10a-109d of the Act pursuant to a resolution adopted by a majority of its Board of Trustees to borrow money and issue securities to finance the acquisition, construction, reconstruction, improvement or equipping of any one project, or more than one, or any combination of projects and to provide for the security and payment of those securities; and

WHEREAS, the term "securities" is defined in the Act to include bonds, notes and other evidences of indebtedness such as financing leases and lease-purchase agreements and securities issued by the University shall be general obligations of the University payable out of any revenues or other funds or moneys of the University; and

WHEREAS, Section 10a-109f of the Act provides that the Board of Trustees of the University shall submit to the Governor each resolution for the issuance of securities approved pursuant to Section 10a-109f of the Act. The Governor may, not later than thirty days after such submission, disapprove such resolution by notifying the Board of Trustees in writing of his disapproval and the reasons for it. If the Governor does not act within such thirty-day period, the resolution is deemed approved; and

WHEREAS, the University desires to enter into a lease-purchase agreement to finance the Heating Plant Upgrade.
NOW THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE UNIVERSITY AS FOLLOWS:

Section 1. A lease-purchase agreement entitled to the benefit, protection and security of the Act in the maximum principal amount of $75,000,000 plus any amounts for the costs of issuance (the “Lease”) is hereby authorized to finance the Heating Plant Upgrade, a project identified in Section 10a-109e of the Act and approved as a project of UConn 2000 (the “Project”). The Project will include the design and construction of a building on Glenbrook Road, adjacent to the current power plant, to house a combined heat and power (CHP, or “cogeneration”) facility, acquisition and installation of the gas turbines, steam turbine, chillers and all associated equipment, and all alterations, repairs and improvements in connection therewith, all required testing and commissioning to make the plant fully operational in compliance with all relevant permits or licenses as well as, engineering, architectural and temporary and permanent financing costs, including capitalized interest thereon. The rent payments under the Lease include an interest and principal components.

Section 2. The rent and other payment obligations of the University under the Lease shall be a general obligation of the University and the full faith and credit of the University is hereby pledged to such payments subject to the existing rights of the University’s bondholders. The Lease shall be payable out of any revenues or other assets, receipts, funds or moneys of the University and may be additionally secured by a pledge of revenues to be derived from the operation of the Project, by assured revenues and by other assets other than a mortgage, subject only to any agreements with the holders of any other securities pledging any particular assets, revenues, receipts, funds or moneys.

Section 3. The Lease shall be dated and shall have a term not longer than thirty years from its date of date, shall carry such interest rate or rates payable at least semiannually after the first year as, the Treasurer of the State (the “Treasurer”) in conjunction with the President or Vice President for Financial Planning and Management of the University (the “Authorized Officers”) shall determine is in the best interests of the State and University.

Section 4. The determination of the principal amount of the various rent payments under the Lease, Lease term, rental payment dates and amounts, interest rate, terms, form and other details of the Lease is hereby delegated to be determined by certificates of the Authorized Officers and the Treasurer in accordance with the Act, such principal amount, Lease term, rental payment dates and amounts, interest rate, terms, form and other details to be conclusively evidenced by the execution and delivery of the Lease.

Section 5. The terms, time and manner of the sale of the Lease including whether such sale is by competitive bid, negotiation or private placement, and any other conditions of the issuance and sale of the Lease shall be determined by the Treasurer pursuant to a certificate of determination which shall be filed with the University and the Secretary of the State Bond Commission on or before the date of delivery of the Lease or any participations or interests therein setting forth the details and particulars of the Lease determined by her: in accordance herewith. The Treasurer is further authorized, pursuant to the Act and pursuant to certain
provisions of the General Statutes of the State of Connecticut, as amended, the authority to enter into agreements in consultation with an Authorized Officer with respect to the issuance and sale of the Lease, or any participations or any interests therein, including financial advisory agreements, purchase agreements and investment agreements.

**Section 6.** The Lease shall be executed and attested to by the signatures of the Authorized Officers and authenticated manually in accordance with the provisions of the Act and the Connecticut General Statutes.

**Section 7.** The Treasurer and the Authorized Officers of the University and each of them, are hereby authorized to perform all acts which are necessary or appropriate in connection with the execution and delivery of the Lease, or any participations or interests therein, provided that the proceeds from the Lease are used for the Project, including distributing an offering statement and entering into continuing disclosure agreements pursuant to the Securities and Exchange Commission Rule 15(c)(2)(12), if necessary, and executing and delivering any acceptance certificates, escrow agreements and related documents.

**Section 8.** In order to maintain the exclusion from gross income for purposes of federal income taxation of interest on the Lease, the University hereby covenants to comply with the provisions of the Code, and any regulations or rulings issued thereunder, applicable to the Lease. Further, the University covenants that it will not take any action or fail to take any action that would cause the Lease to be “arbitrage bonds” within the meaning of Section 148(a) of the Code. In fulfilling the covenants set forth in this Section, the University hereby agrees to instruct all parties acting by or on behalf of the University or in any manner with respect to the Lease regarding all acts necessary to satisfy and fulfill such covenants. If the Lease or any portion thereof is issued on a tax-exempt basis, the Treasurer and the Authorized Officers, and each of them, are authorized to bind the University pursuant to such representations and covenants as each of them deem necessary or advisable in order to maintain the continued exemption from federal income taxation of interest on the Lease, including covenants to pay rebates of investment earnings to the United State in future years.

**Section 9.** The Treasurer and the Authorized Officers, and each of them, hereby is authorized to provide for the security and payment of the Lease and for the rights of the holders of the Lease, or any participations or interests therein, to secure such obligations, pledge security and execute such security agreements, reimbursement agreements, instruments, opinions, certificates, affidavits and other documents and to do or cause to be done any and all other acts and things necessary, advisable or proper for carrying out this resolution, the terms, obligations and/or security of the Lease and the implementation of the Project.

**Section 10.** The University reasonably expects to incur expenditures (the “Expenditures”) in connection with the capital Project for which a general functional description is provided above. The University reasonably expects to reimburse itself for the costs of the expenditures with the proceeds of the obligations of the University described above. The maximum principal amount of such debt to be issued as a tax-exempt obligation is not expected to exceed $75,000,000. This declaration of official intent is a declaration of official intent made pursuant to Treasury Regulation Section 1.150-2.
Section 11. An Authorized Officer shall cause the resolution of the Board of Trustees approving the Lease to be submitted to the Governor for his approval in accordance with Section 10a-109f.
TO: Members of the Board of Trustees
FROM: Dale M. Dreyfuss
RE: Cogeneration Discussion on January 14

Since our last review of this project on October 1, the University has reviewed a proposal from Caterpillar Financial to finance the entire project – including construction financing – in the amount of $75 million. The expected interest rate at this time is 4.3%. Term of the loan is 20 years, with annual debt service of approximately $5.9 million commencing when the plant is put into service. Net present value benefit of this cogeneration configuration under the proposed terms exceeds $67 million. Pending completion of due diligence, Caterpillar Financial is prepared to make a commitment of funds.

Because the debt will be structured as a tax exempt financing, we have requested assistance of board counsel to assure their comfort in recommending it for approval by the State Treasurer. We expect as well to retain special counsel with expertise in the particular area of power plants and cogeneration, to advise the University over the course of contracting, construction and operation.

Our consultants, Dahlen, Berg & Co., have incorporated the Caterpillar Financial proposal in preparing the accompanying updated analysis of the project. We believe it provides a useful summary to inform the Board’s discussion on January 14.
CONFIDENTIAL

CENTRAL COGENERATION PLANT

PROJECT STATUS

FOR

THE UNIVERSITY OF CONNECTICUT

STORRS CAMPUS

DAHLEN, BERG & CO.

ENERGY SUPPLY MANAGEMENT

January 8, 2003
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Section 1. Project Summary

For the past several years, UConn has been developing a plan to meet the long-term energy needs of the Storrs Campus. This report has been prepared to inform the Board of Trustees on the status of the Cogeneration Power Plant project.

UConn Notified Select That They Were Chosen Proposer
UConn sent a letter to Select Energy Services, Inc. (Select) on October 7, 2002, informing them of UConn’s intent to negotiate an EPC contract for Project BI-900886, Central Cogeneration/Chiller Based Energy Facility.

UConn Is Negotiating With Select
On November 7, 2002, the first meeting was held for the EPC contract negotiation. A subsequent meeting was held on December 12, 2002, to discuss the terms of a Letter of Intent (LOI) and the technical design of the plant. The LOI will enable Select to continue project design efforts.

Select should be prepared to discuss the language revisions and scope of the LOI with UConn later this month.

Project Duration Is Projected to be 2½ Years
The total duration of the Cogeneration Plant project is projected to be 2½ years. If the air emissions permit can be prepared and approved without complications, the plant would be available for operation in early 2005. The project start would coincide with the start of preparation of the air emissions permit this month.

Plant Size Limited to 24.9 MW
Under all conditions, the plant capacity would be limited to 24.9 MW to avoid the need for Connecticut Siting Council review and approval.

The plant capacity would be designed to produce 23.5 MW at 90°F, which is similar to the conditions at which the UConn electrical peak occurs. Although the plant output would be greater at lower ambient temperatures, the output would be limited to 24.9 MW. The full description of the project is included as Appendix A.
Caterpillar Has Offered Financing

Caterpillar (the parent company of Solar Turbines) has extended a financing proposal to UConn at an indicated rate of 4.3% and a term of 20 years.

The indicated financing rate is somewhat lower than the 4.5% used in the September 25, 2002, financial projections, which are included as Appendix B. The projections at 4.5% indicate a NPV savings of $66.7 million compared to the minimum case (no cogeneration).

Project Economics Have Not Changed

The project economics have not changed from the previous financial projections at 4.5%, which are included as Appendix B.

Remaining Sections Describe Status of Cogeneration Project in Specific Areas

The remainder of the report describes the status of the Cogeneration Power Plant project in the following areas:

- Financing,
- Environmental Permitting,
- Natural Gas Procurement,
- Electrical Interconnection, and
- Operation and Maintenance
Section 2. Financing

This section describes the financing activities that have taken place since the October Board of Trustees meeting.

**Caterpillar Provided Indicative Financing Proposal**

Caterpillar Financial Services Corporation (Caterpillar) provided a indicative loan proposal for the Cogeneration Power Plant project on December 6, 2002.

**Financing Would Be A Government Lease Purchase**

The financing would be a government lease purchase for the full amount of the project. The lease has a 20-year term, which would begin once construction is complete.

**Financing Proposal Includes Construction Financing**

The financing proposal also includes construction financing at the same interest rate.

**Proposal Indicated Interest Rate of 4.3%**

Caterpillar’s proposal indicated an annual interest rate of 4.3%. The final interest rate will be determined based on an indexed calculation once the loan is closed. The interest rate of 4.3% is somewhat more favorable than the most optimistic discount rate scenario examined in our September 25, 2002 report (4.5%), attached as Appendix B. That discount rate led to a net present value of $66.7 million for the project.

**UConn is Continuing To Negotiate with Caterpillar**

UConn is continuing to negotiate with Caterpillar and has exchanged information on projected cash flow and modifications and clarifications to the finance agreement terms and conditions.
## Section 3. Environmental Permitting

The Environmental Permits of the Cogeneration Plant include:
- New Source Review Air Emission Permit
- Title V Air Permit Modification
- Water and other waste permits

The New Source Review (NSR) permit is the critical path permit and is the focus of this section. The other permits are not required prior to construction.

| An Environmental Permit Plan Has Been Prepared | An environmental permit plan has been prepared, which outlines the issues, decisions, and information required to prepare the environmental permit applications. This plan outlines the path to determine the permit requirements at different emissions output levels so that actions and strategies can be implemented. The goal is to avoid unnecessary permitting complications, such as the need to perform air dispersion modeling. |
| New Source Review Air Emission Permit Takes Longest | The New Source Review permit has the longest lead time for both preparation and review. This permit is filed with the Connecticut Department of Environmental Protection (CTDEP). |
| Preparation of the NSR Permit Requires 3 to 6 Months | The NSR permit application is projected to take 3 to 6 months for preparation, depending on whether air dispersion modeling is required. The information requirements have been identified and responsibility for supplying the information has been divided between Select and UConn. |
| CTDEP Approval May Take Until 2004 | The review and approval of the NSR permit application by the CTDEP is projected to take up to 12 months. After considering the time to assemble the data and prepare the permit, the permit may not be approved until the 1st quarter of 2004. |
| Construction Can Begin After Issuance of the NSR Permit | Construction can begin after issuance of the NSR permit. This permit is both a permit to construct and a permit to operate. The permit would contain specific language for operation and emissions reporting for the proposed cogeneration plant. |
Section 4. Natural Gas Procurement

Natural gas is projected to supply the majority of fuel to the Cogeneration Plant and represents the highest present value cost for this project.

There are two delivery alternatives for a natural gas interconnection:
- Connection to Algonquin/Duke transmission line
- Connection to Connecticut Natural Gas (CNG) delivery station

There are two supply approaches to providing the natural gas commodity:
- Supply from CNG
- Supply from another gas marketer

---

Algonquin is preparing an interconnection proposal, which will include construction of 8000 feet of pipeline and other infrastructure to deliver gas to the Cogeneration plant. The Algonquin high-pressure gas transmission pipeline runs close to the campus and is owned by Duke Energy.

---

We have started negotiations with CNG regarding a connection to their delivery station (off the Algonquin pipeline). CNG will provide a proposal for the interconnection facilities, delivery charge options, and gas supply options.

---

The natural gas commodity could be supplied by CNG or another marketer. The Cogeneration Plant’s gas requirements will vary with season and temperature, therefore arrangements with CNG may simplify balancing and scheduling of natural gas use. If the natural gas is purchased from a gas marketer, a daily management effort could be required. The management efforts, unscheduled use penalty provisions, and cost of gas will all be considered to determine the preferred supply arrangement.

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Natural gas prices are currently high for a number of reasons. These include drawn down inventories, the possibility of war, and the political crisis in Venezuela. The following chart of average yearly NYMEX futures prices shows that the market expects natural gas prices to decrease from their current levels.
Average Annual NYMEX Futures Natural Gas Commodity Prices

<table>
<thead>
<tr>
<th>Year</th>
<th>Natural Gas Price ($/MMBtu)</th>
</tr>
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<tbody>
<tr>
<td>Feb.-Dec. 2003</td>
<td>$4.899</td>
</tr>
<tr>
<td>2004</td>
<td>4.397</td>
</tr>
<tr>
<td>2005</td>
<td>3.977</td>
</tr>
<tr>
<td>2006</td>
<td>3.828</td>
</tr>
<tr>
<td>2007</td>
<td>3.886</td>
</tr>
<tr>
<td>2008</td>
<td>$3.933</td>
</tr>
</tbody>
</table>

Source: Annual averages of monthly futures contracts as listed on NYMEX.com, January 6, 2003.

Electricity Prices in New England Are Expected To Be Based on Natural Gas Prices

Electricity prices in New England are expected to be based on natural gas prices. This relationship results from the fact that natural gas-fired generators frequently set the price in the New England Power Pool (NEPOOL).

Cogeneration Value Increases as Gas Prices Increase

The following graph shows that, at any one point in time, an increase in natural gas price increases the value of cogeneration.

[Graph: Gas Cost vs. Total Value - 2004 Production Levels]

- Gas Cost
- Total Value
Section 5. Electrical Interconnection

This section addresses the plan for reaching agreement with Connecticut Light & Power (CL&P) on electrical interconnection design.

<table>
<thead>
<tr>
<th>UConn Authorized CL&amp;P to Release Information to Select</th>
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<tbody>
<tr>
<td>In mid-November UConn authorized CL&amp;P to release information and meet with Select regarding the existing substation and interconnection between CL&amp;P and UConn. Coordination with CL&amp;P is necessary to determine the type and design of the Cogeneration Plant’s electrical interconnection.</td>
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<tr>
<th>Select Exchanged Information with CL&amp;P</th>
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<tbody>
<tr>
<td>Select and CL&amp;P discussed the conceptual interconnection design and CL&amp;P indicated that a dedicated substation would be required for this interconnection. Select used the CL&amp;P “Guideline for Cogeneration and Small Power Production” document (that dates to 1986) and preliminary study information to develop their proposed interconnection design.</td>
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<tr>
<th>Select and CL&amp;P Have Made Little Progress</th>
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<tr>
<td>Select has made little progress with CL&amp;P on agreement in the conceptual interconnection design. After the differences in the preliminary interconnection investigation were resolved, it appeared that a dedicated interconnection would not be required. Since then, CL&amp;P has suggested that their “current policy” may still require a dedicated interconnection because CL&amp;P must retain the ability to upgrade its use of facilities in the future.</td>
</tr>
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<thead>
<tr>
<th>UConn and Dahlen, Berg &amp; Co. Will Negotiate With CL&amp;P</th>
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</thead>
<tbody>
<tr>
<td>UConn and Dahlen, Berg &amp; Co. will negotiate with CL&amp;P for the minimum interconnection cost required to import electricity and to protect the CL&amp;P system.</td>
</tr>
</tbody>
</table>
Section 6. Operation and Maintenance

The following section describes the activities undertaken to develop the operation and maintenance (O&M) arrangements for the cogeneration project.

UConn Met with Northeast Generation Services

UConn has met with Northeast Generation Services (NGS) several times over the past three months to discuss current operation of the CUP and the transition to operation of the entire facility by NGS.

NGS’s O&M Costs Are Higher than Original Proposal

NGS’s O&M cost estimate, as presented in their December 19, 2002 “Operations and Maintenance Plan,” is significantly higher than their March, 26, 2002 proposal. This is largely due to an increase in the proposed staffing level for the project.

Two Alternatives Could Lead to Lower Cost than NGS

There are two alternatives that could lead to lower O&M costs than a contract with NGS. They are:

- UConn operation of the project and
- Another O&M contractor
Appendix A. Full Project Description

The following is a reproduction of Section 3.3 (25 MW Cogeneration Case) from the report “Energy Supply Alternatives for the University of Connecticut, Storrs Campus” dated September 25, 2002.

The proposed project is a 25 MW cogeneration facility. This includes the following significant components:

- 6,000 tons of additional central chilling capacity,
- Natural gas bypass pipe to transmission line,
- Metering, and
- 25 MW of electric generation capacity utilizing cogeneration and capturing waste heat for steam generation.

**Plant Would Have 3 Combustion Turbine Generators**

The 25 MW cogeneration alternative consists of three combustion turbine generators, with heat recovery for “base loaded” operation. Supplemental firing shall be provided within the HRSG to provide additional steaming capability. In addition, the plant would include a steam turbine generation for additional electricity production.

Plant capacity, defined in terms of gross plant electrical output, is expected to not exceed 25,000 kW based on ISO conditions.

The plant will be operated as a manned, base loaded plant with capabilities to parallel, and island from the Connecticut Light & Power (CL&P) grid, providing electrical power, steam and chilled water energy to the study area.

The combustion turbine generator will operate on natural gas fuel as the primary fuel with liquid fuel provided as a back-up fuel source.

**Facility Would Also Have a Steam Turbine Generator**

The technology selected to cogenerate electric power and thermal energy in the form of steam is “combined cycle,” where a portion of the total electric power is generated by the use of a combustion turbine generator (CTG). The waste heat from the CTG is captured utilizing a heat recovery steam generator (HRSG) and a steam cycle is established utilizing this waste heat. The steam generated is used to generate additional electrical power in a steam turbine generator (STG) and in the case of this alternative would also be used to drive the additional 6,000 tons of steam drive, centrifugal chillers to make chilled water for distribution to the study area. The combined cycle technology was selected based on the following factors:
• Competitive life cycle costs as compared to other technologies,
• Efficient and clean through use of natural gas as the primary fuel,
• Proven, established track record, and
• Can be accommodated in urban settings (such as a university campus) with minimal disruption.

This alternative has been conceptualized based on the following design criteria:

• Limited physical space available within and adjacent to the existing central utility plant,
• Adequate and fairly new steam generation and chilling capabilities,
• Vibration/acoustical sensitivity of adjoining facilities and mission, and
• Existing central utility operations.

Plant Would Conform to Environmental and Acoustical Regulations

Emissions controls, as required to satisfy regulatory requirements, would be accomplished utilizing the following measures:

• Combustion turbine generators equipped with dry low NOX technology, and
• Selective Catalytic Reduction utilizing NOX and CO catalysts.

The operation of the SCR would require the on-site storage of aqueous ammonia.

Emissions monitoring would be provided using a Continuous Emission Monitoring System (CEMS).

Permissible sound levels would comply with the laws of the UCONN Master Plan and State of Connecticut where this equipment will be installed. The plant would also comply with the laws of the Federal Government (OSHA and EPA) as to noise exposure to personnel within the plant area.

Major rotating equipment installations would be designed and constructed to mitigate the transmission of vibration of the facility’s structure.

Electrical Interconnect Would Use Existing System

The new cogeneration equipment would generate electrical power at a 13.8 kV level and be interconnected to the existing campus 15 kV distribution bus. Paralleling switchgear and the appropriate relay protection systems have been contemplated.
Existing Condensate and Feedwater Systems Would Be Utilized

It has been assumed that the existing condensate, feedwater, and water treatment systems would require minor upgrades to support the new steam cycle.

A Metering System Would Be Installed

Distribution metering of utility services will be installed to provide real time, commercially measurable output for the purposes of cost accounting. This system should measure electric, chilled water, and steam functions.

Existing Water and Waste Water Facilities Would Be Used; New Industrial Waste Equipment Required

Water for the new facility would be furnished by the existing well water system currently serving the campus.

Sanitary waste water would be tied into the existing waste collection system serving the campus for treatment at the on-site treatment facility. Industrial waste would be neutralized and processed through a new oil/water separator at the plant prior to release to the campus waste system for final treatment.

Site Would Be Approximately 13,000 Square Feet in Size

The new cogeneration equipment and chillers would be located in a separate building adjoining the existing Central Utility Plant. This would be a multiple story facility with a footprint of approximately 13,000 square feet.

Gas Turbines Would Be Solar Taurus 70's or Equivalent

The Combustion Gas Turbines would be Solar Taurus 70's or equivalent, equipped with the following attributes:

- Dry Low NO\textsubscript{x} package,
- Dual fuel capability,
- 13.8 kV generator,
- Lube oil coolers (plate frame heat exchangers), and
- Acoustical Enclosure

Heat Recovery Steam Generator Would Be a Deltak or Equivalent

The Heat Recovery Steam Generator would be manufactured by Deltak, ERI, ABCO, or equivalent, equipped with the following attributes:

- Single pressure boiler (600 psig),
- Duct burner for supplemental firing, and
- SCR with NO\textsubscript{x} and CO catalysts.
Steam Turbine
Generator Would Be a GE or Equivalent

The Steam Turbine Generator would be manufactured by GE, Hitachi, or equivalent, equipped with a 600 psig condensing type turbine.
Appendix B. Projected Financial Results

The following is a reproduction of Section 4 (Comparison of Alternatives – Financial) from the report "Energy Supply Alternatives for the University of Connecticut, Storrs Campus" dated September 25, 2002.

This section compares the capital cost, present value operating cost, present value total cost, and net present value (NPV) of the Minimum Configuration, 25 MW Cogeneration alternative, and 50 MW Cogeneration alternative.

<table>
<thead>
<tr>
<th>Minimum Configuration Has the Lowest Capital Cost</th>
<th>The Minimum Configuration has the lowest capital cost of the three alternatives. The following table summarizes the capital cost estimates for each alternative:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Cost Estimates ($ millions)</td>
<td></td>
</tr>
<tr>
<td>Alternative</td>
<td></td>
</tr>
<tr>
<td>Capital Cost</td>
<td></td>
</tr>
<tr>
<td>Minimum Configuration</td>
<td>$ 22.7</td>
</tr>
<tr>
<td>25 MW Cogeneration</td>
<td>75.3</td>
</tr>
<tr>
<td>50 MW Cogeneration</td>
<td>$ 129.6</td>
</tr>
</tbody>
</table>

The 25 MW Cogeneration alternative has the lowest present value operating costs of the three alternatives. The following table summarizes the present value operating cost estimates for each alternative under three different discount rate assumptions:

<table>
<thead>
<tr>
<th>Present Value Operating Cost Estimates – 2004-2033 ($) millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative</td>
</tr>
<tr>
<td>4.5% Discount</td>
</tr>
<tr>
<td>6.5% Discount</td>
</tr>
<tr>
<td>8.5% Discount</td>
</tr>
</tbody>
</table>
### Projected Financial Results

| Minimum | $482.8  
|  | 362.9  
|  | $281.2  
| 25 MW | 363.5  
|  | 273.1  
|  | 211.6  
| 50 MW | $475.6  
|  | 357.9  
|  | $277.7  

---

25 MW Cogeneration Alternative Has Lowest Total Present Value Cost

The 25 MW Cogeneration alternative has the lowest total present value cost of the three alternatives. Total present value cost is equal to capital cost plus present value operating costs. The following table summarizes the total present value cost estimates for each alternative:

#### Total Present Value Cost Estimates

(\$ millions)  
(2002)

| Alternative | 4.5% Discount  
| 6.5% Discount  
| 8.5% Discount  
| Minimum | $505.5  
|  | 385.6  
|  | $303.9  
| 25 MW | 438.8  
|  | 348.4  
|  | 286.9  
| 50 MW | $491.1  
|  | 401.2  

B-2
$340.0

25 MW Alternative Has Highest NPV Compared to Minimum Alternative

At discount rates of 4.5%-8.5%, the 25 MW Cogeneration alternative has the highest NPV, ranging from $17.0 million at an 8.5% discount rate to $66.7 million at a 4.5% discount rate. NPV is the difference in the total present value costs (shown in previous table). The following table summarizes the total NPV estimates for each alternative under three different discount rate assumptions:

Total Net Present Value Estimates
($ millions 2002)

<table>
<thead>
<tr>
<th>Alternative</th>
<th>4.5% Discount</th>
<th>6.5% Discount</th>
<th>8.5% Discount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>$0.0</td>
<td>$0.0</td>
<td>$0.0</td>
</tr>
<tr>
<td>25 MW</td>
<td></td>
<td>66.7</td>
<td>17.0</td>
</tr>
<tr>
<td>50 MW</td>
<td>$14.4</td>
<td>(15.6)</td>
<td>($36.1)</td>
</tr>
</tbody>
</table>

50 MW Cogeneration Alternative Has Negative NPV at Higher Discount Rates

At higher discount rates, the 50 MW Cogeneration alternative has a negative NPV. As the table above shows, at discount rates of 6.5% and 8.5% the 50 Megawatt Cogeneration alternative has NPVs of negative $15.6 million and negative $36.1 million, respectively.

25 MW Cogeneration Alternative Has 11.0% Internal Rate of Return

The 25 MW Cogeneration alternative has an internal rate of return at 11.0%.
Cogeneration Reduces Energy Price Risk

The cogeneration alternatives reduce overall energy price risk because cogeneration is more efficient in jointly producing steam and water than the Minimum Configuration.