Business and Financing Structures for Integrating Campus and Community Energy Programs

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SVP System Development
Ever-Green Energy
Campus Energy System Trends
The Push-Pull Dynamic

Growth and Change
- Technology advancements
- Environmental commitments
  - Decarbonization
  - Water use
- Reliability and resilience goals
- Microgrid initiatives
- Localization of energy supply

Inhibitors
- Constrained capital budgets
- Stagnant or decreasing operating budgets
- Aging infrastructure
- Retiring workforce
Campus Energy System Trends: Privatization
Campus Energy System Trends:
Integration with the Adjacent Community
CASE STUDIES: STRUCTURES FOR INTEGRATING CAMPUSES AND COMMUNITIES
Expanding District Energy in Morris, MN
UMM’s Current Heating System

Four gas-fired steam boilers

Biomass gasifier
Advancing Energy in Morris

Goals

• Reduce overall energy costs
• Localize energy supply
• Resilience
• Carbon neutrality
• Increase efficiency
• Reduce maintenance costs
• Avoid unnecessary capital costs
Aggregated Capacity & Demand
Integration Benefits

• Reduced energy-related costs for the parties by ~10%
• Reduced carbon emissions in Morris by 28%
• Avoids upcoming capital needs at the elementary school and hospital
• Establishes the framework for further growth in Morris
UMM Implementation Structure

1. Establish DES as an independent business
2. Cost-based energy rates
3. DES Governance includes local stakeholders
4. DES buys capacity & energy from UMM to sell to customers
5. UMM Staff operates
6. Long-term contracts secure 3rd party financing
7. No investment from local partners
UMM Implementation Structure

No investment from UMM
Revenue stream for capacity and energy
Revenue stream for operations

Third-Party Financing

U of M Morris

Capacity & Energy
Operations & Maintenance

Energy Payments
O&M Fees

DES

Capacity & Energy

School District

SCMC

Energy Payments

Debt Service
Achieving Carbon Neutrality at Oberlin College
Oberlin’s Opportunity

Reduce current scope 1 and 2 carbon emissions by 73%

• 92% reduction from the 2007 baseline.
• Annual water reduction of 7.5 million gallons
• Annual sewer discharge of 5.8 million gallons
• Implementable without capital investment from Oberlin
Transforming from Steam to Hot Water with Landfill Gas CHP
Projected Scope 1 & 2 Carbon Reductions

**Carbon Dioxide Emissions**
*(As Metric Tons CO₂)*

<table>
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<tr>
<th>Year</th>
<th>Electric</th>
<th>Natural Gas Other</th>
<th>Natural Gas Central Plant</th>
<th>Coal</th>
<th>Total CO₂</th>
<th>2007 Baseline</th>
<th>% Reduction (2007 Baseline)</th>
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<td>20,720</td>
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<td>2013</td>
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<td>13,934</td>
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<td>2015</td>
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<td>2,493</td>
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<td>14,456</td>
<td>44,693</td>
<td>68%</td>
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<td>2020</td>
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<td>1,082</td>
<td>191</td>
<td>0</td>
<td>3,724</td>
<td>44,693</td>
<td>92%</td>
</tr>
<tr>
<td>2025</td>
<td>2,450</td>
<td>1,082</td>
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</tbody>
</table>

Additional steps need to be taken to eliminate these remaining carbon emissions.
Integrating with the Oberlin Community
Advancing Integration with the Community

- Expansion of the Oberlin Project
- Oberlin Community Services collaboration
- Community benefits agreement
- Community engagement forum
Oberlin Implementation Structure

1. Establish DES as an independent business
2. Cost-based energy rates
3. DES governance includes local stakeholders
4. DES purchases campus generation assets from Oberlin College
5. Long-term contracts secure 3rd party financing
   - NO INVESTMENT FROM LOCAL PARTNERS
Oberlin Implementation Structure

- Landfill Operator
  - Energy Payments to Renewable Energy
  - Debt Service from Capacity & Energy Payments

- Third-Party Financing
  - Debt Service to Capacity & Energy Payments

- DES
  - Capital Payment for Boilers
  - Energy Payments to Other Customers
  - Capacity & Energy Payments

- Oberlin College
  - 92% of carbon eliminated
  - Reduced energy costs
  - No investment from Oberlin
  - Retirement of boiler plant debt

- Other Customers
  - Energy Payments from DES
Redeveloping the Towerside District Adjacent to the University of Minnesota
Towerside Partnership
The Initial District Energy System: Wastewater Energy Recovery
Integration with the University of Minnesota

- Heating redundancy and peak
- Cooling redundancy and peak
- Location of energy exchange facility
- Carbon-free energy supply for future buildings
Towerside Implementation Structure

1. Establish DES as a private non-profit business
2. Cost-based energy rates
3. DES governance includes local stakeholders & customers
4. Long-term contracts secure 3rd party financing
5. Structured to be integrated w/ other district systems

NO INVESTMENT FROM LOCAL PARTNERS
Towerside Implementation Structure

- **Met Council**
- **Univ. of Minnesota**
- **Third-Party Financing**
- **DES**
- **System Customers**

**Access to carbon-free energy supply**
- No capital investment
- Energy payments
- Rent payments

- Renewable Energy
- Energy Payments
- Rent
- Capacity & Energy Land
- Debt Service
- Financing
- Energy Payments
- Capacity & Energy

**Notes:**
- Ever-Green Energy Logo
Summary

- Campus system advancement can take many forms and structures – what are your goals?
- Goals can be achieved without capital investment from campuses
- Campuses can be:
  - Developers
  - Operators
  - Energy and capacity sellers
  - Exclusively customers
- Campuses need to be champions of advancement
QUESTIONS?

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