Renewable Energy Credits, Grants, and Funding
Michael Philips

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Introduction

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  Supporting the appraisal, development, and financing of energy efficiency and clean energy projects
Overview

- Grants & Rebates
  - Federal and state
- Production credits
- Environmental credits
  - Renewable Energy Certificates (RECs)
  - NOx allowances
  - Carbon credits
- Financing approaches
  - Bonds, leases, performance contracting, private participation

Grants & Rebates

- Grants & Rebates: [www.dsireusa.org](http://www.dsireusa.org)
- State clean energy funds
- Clean air funds for State Implementation Plan
- Homeland security funds
- EPA Supplemental Environmental Projects
Federal Grants

- No major project grant programs at EPA or DOE
- Small grants ($10,000+) for studies tucked away in various programs – EPA, DOE
- Department of Homeland Security
- Earmarks

USDA Grants

- Renewable Energy Systems & Energy Efficiency Improvements Grant Program
  - Only agricultural producers & rural small businesses eligible.
  - Colleges may join consortia with farmers/small businesses - farmer/small business must be majority owner
  - Project costs covered: 25% max up to $500k
  - Project must be in rural area
USDA Guarantees

- Renewable Energy Systems & Energy Efficiency Improvements Loan Guarantee Program
  - Same eligibility as Grant program
  - Coverage:
    - 85% for projects up to $600k
    - 80% up to $5 million
    - 70% up to $10 million

Energy Security Act of 2007 Section 471

- Technical assistance grants for “a portion” of study costs
- Energy efficiency project grants – on-site renewable energy included
- Grants for “innovative” energy technologies
- **No FY ’08 appropriations or FY ’09 request**
Renewable Energy Production Incentive (REPI)

- Generator receives 1.5 cents/kWh (1993 dollars and indexed for inflation)
- 10 year term
- Eligibility: Public entities and electric coops
- No MSW-powered plants
- Subject to available appropriations

Environmental Credits

- Renewable Energy Certificates
- Carbon Credits
- NOx Allowances
Renewable Energy Certificates

- RECs represent the “environmental attributes” of green power
- Denominated in kWh (or MWh)
- Cost 1¢ - 3¢ per kWh (PV is much higher)
- Linked to actual kWh generated
- Certification
- To sell or not to sell your RECs

Environmental Credits

- Carbon credits
  - Voluntary markets
  - Regional efforts
  - Chicago Climate Exchange
- NOx Allowances
  - SIP compliance
Financing Options

- Short-term debt
  - Bank loan (term loans, lines of credit)
- Long-term debt
  - Loan from operating fund
  - Component of bond issuance
  - Endowment loan

Clean & Renewable Energy Bonds (CREB)

- 0% interest rate paid by borrower
- Bond holders get tax credits in lieu of interest
- Can cover up to 100% of project costs
- Eligibility: Public entities – cities, states, tribes, electric coops, public colleges & universities
- Fully subscribed – more applicants than funds available ($1.2 billion)
More Financing Options

- Lease
- Performance Contract
- Private Ownership
  - Minnesota “Flip” Model – for wind
    - Private owners gets tax credits, gov’t rebates, RECs, PPA, etc.
- PPA - for PV
  - Dependent on state tax incentives

Cost of Renewable Energy

<table>
<thead>
<tr>
<th>Energy Type</th>
<th>per installed KW</th>
<th>per kWh generated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind</td>
<td>$1,700 - $2,300</td>
<td>4.5¢ - 8.0¢</td>
</tr>
<tr>
<td>Biomass</td>
<td>$1,300 - $3,000</td>
<td>4.5¢ - 8.0¢</td>
</tr>
<tr>
<td>Solar PV</td>
<td>$5,500 - $6,300</td>
<td>30¢ - 80¢</td>
</tr>
</tbody>
</table>
**Post-Construction Revenue Streams**

- Electricity sales (or reduced elec. bills)
- Reduced peak demand charges
- REC sales
- Emission reductions
- Production credit
  - Federal & State
- Tax credit
  - Federal & State

**First Year Revenues & Costs for a 100 KW Solar PV System**

<table>
<thead>
<tr>
<th>Revenues</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced grid purchases</td>
<td>$38,690</td>
</tr>
<tr>
<td>REC sales @ $.75/kWh</td>
<td>$ 1,450</td>
</tr>
<tr>
<td><strong>Total Revenues</strong></td>
<td><strong>$40,140</strong></td>
</tr>
<tr>
<td>Expenses</td>
<td></td>
</tr>
<tr>
<td>O&amp;M</td>
<td>$ 3,250</td>
</tr>
<tr>
<td><strong>Operating Cash</strong></td>
<td><strong>$36,890</strong></td>
</tr>
<tr>
<td>Debt Service @ 5%, 15 yr</td>
<td>$31,311</td>
</tr>
<tr>
<td>Coverage ratio 1.18</td>
<td></td>
</tr>
<tr>
<td><strong>Project Reserves</strong></td>
<td><strong>$ 5,579</strong></td>
</tr>
</tbody>
</table>

Assumptions:
- Installed cost: 6.50/watt
- Rebates: 3.50/watt
- Cost: $325,000
- Avg. daily power gen: 650 kWh
- Annual power gen: 193,450 kWh
- Electric rate: $.18/kWh
First Year Revenues & Costs for a Small 10 KW Wind Turbine

<table>
<thead>
<tr>
<th>Revenues</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity sales/savings</td>
<td>$4,320</td>
</tr>
<tr>
<td></td>
<td>Cost: $34,950</td>
</tr>
<tr>
<td></td>
<td>Avg. daily output: 65.76 kWh</td>
</tr>
<tr>
<td>Expenses</td>
<td>$349</td>
</tr>
<tr>
<td></td>
<td>Electric rate: $.18/kWh</td>
</tr>
<tr>
<td>Operating cash flow</td>
<td>$3,970</td>
</tr>
<tr>
<td>Debt Service, - 5% int, 5 yr</td>
<td>$3,367</td>
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<tr>
<td>Coverage ratio 1.18</td>
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<tr>
<td>Project reserves</td>
<td>$603</td>
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</tbody>
</table>

First Year Revenues & Costs for a 750 KW Wind Turbine

<table>
<thead>
<tr>
<th>Revenues on 4,700,000 kWh/yr</th>
<th>Assumptions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPA @ $.035/kWh</td>
<td>$164,500</td>
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<tr>
<td>State prod. pmt @ $.015/kWh</td>
<td>$78,228</td>
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<tr>
<td>Total Revenues</td>
<td>$234,728</td>
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<tr>
<td>Expenses</td>
<td></td>
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<tr>
<td>Mgmt fee</td>
<td>$22,500</td>
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<tr>
<td>Service warranty</td>
<td>$22,000</td>
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<tr>
<td>Elec. usage</td>
<td>$1,000</td>
</tr>
<tr>
<td>Land lease</td>
<td>$4,000</td>
</tr>
<tr>
<td>Insurance</td>
<td>$10,000</td>
</tr>
<tr>
<td>Total Expenses</td>
<td>$59,500</td>
</tr>
<tr>
<td>Operating Cash</td>
<td>$175,228</td>
</tr>
<tr>
<td>Debt Service</td>
<td>$136,447</td>
</tr>
<tr>
<td>Coverage ratio 1.21</td>
<td></td>
</tr>
<tr>
<td>Project reserves</td>
<td>$38,781</td>
</tr>
<tr>
<td>Fed PTC value</td>
<td>$79,591 (This value will increase over 10 yrs)</td>
</tr>
<tr>
<td>Depreciation value</td>
<td>$105,876 (This value will decrease over 5 yrs)</td>
</tr>
</tbody>
</table>
Renewable Energy Hedge

• A way to capture the price stability of renewable energy
• Local utility enters into long-term fixed-price contract with a green power generator
• Utility passes on the contract to consumers
• Example: Austin Energy and Concordia University
• Only affects the generation portion of the utility bill

Using Wind RECs to Hedge Fuel Price Volatility
Contract-For-Differences for Wind Power

- A forward contract between the college/university and a power supplier
- Parties pay each other as the wholesale price of electricity fluctuates above or below a strike price
- Can be undertaken for either conventional power or green power
THANK YOU