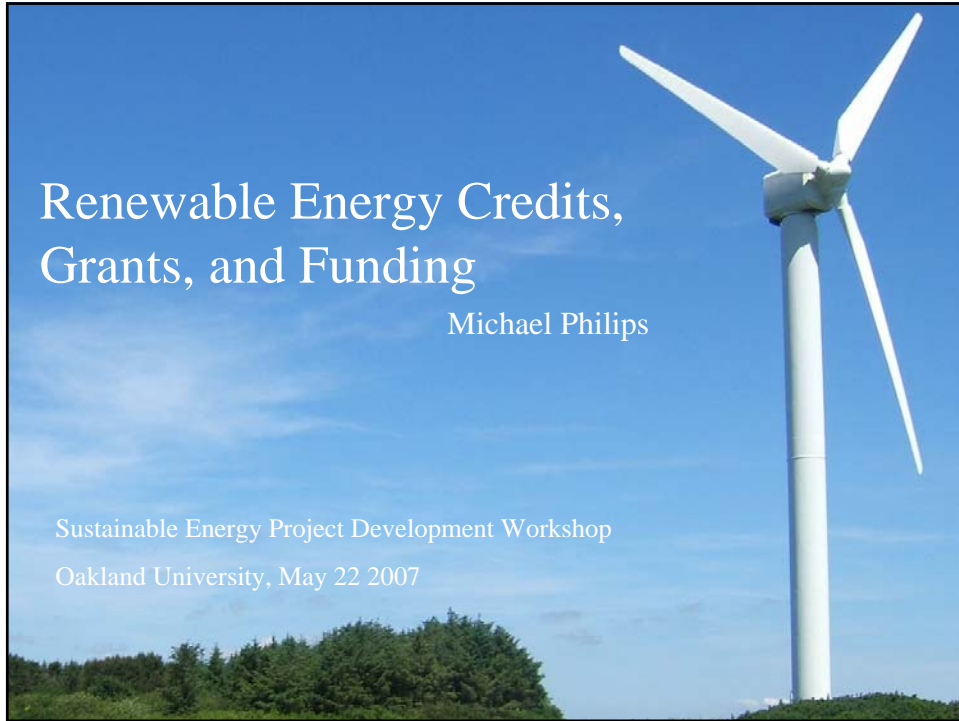


# Renewable Energy Credits, Grants, and Funding

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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

	per installed KW	per kWh generated
• Wind	\$1,700 - \$2,300	4.5¢ - 8.0 ¢
• Biomass	\$1,300 - \$3,000	4.5¢ - 8.0¢
• Solar PV	\$5,500 - \$6,300	30¢ - 80¢



## 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

• <b>Revenues</b>		<b>Assumptions</b>
• Reduced grid purchases	\$38,690	Installed cost: 6.50/watt
• REC sales @ \$.75/kWh	\$ 1,450	Rebates: 3.50/watt
• <b>Total Revenues</b>	\$40,140	Cost: \$325,000
• <b>Expenses</b>		Avg. daily power gen: 650 kWh
• O&M	\$ 3,250	Annual power gen: 193,450 kWh
• <b>Operating Cash</b>	\$36,890	Electric rate: \$.18/kWh
• Debt Service @ 5%, 15 yr	\$31,311	
• Coverage ratio 1.18		
• <b>Project Reserves</b>	<b>\$ 5,579</b>	

## First Year Revenues & Costs for a Small 10 KW Wind Turbine

<ul style="list-style-type: none"> <li>• <b>Revenues</b></li> <li>• Electricity sales/savings \$4,320</li> <li>• <b>Expenses</b></li> <li>• O&amp;M \$ 349</li> <li>• <b>Operating cash flow</b> \$3,970</li> <li>• <b>Debt Service, - 5% int, 5 yr</b> \$3,367</li> <li>• Coverage ratio 1.18</li> <li>• <b>Project reserves</b> \$ 603</li> </ul>	<b>Assumptions</b> Cost: \$34,950 Avg. daily output: 65.76 kWh Annual output: 24,000 kWh Electric rate: \$.18/kWh
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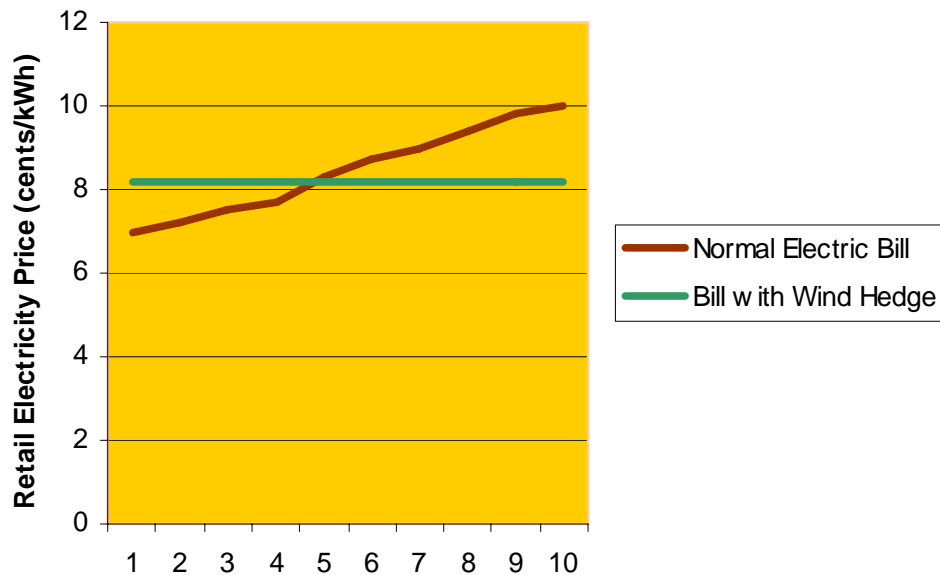
## First Year Revenues & Costs for a 750 KW Wind Turbine

<ul style="list-style-type: none"> <li>• <b>Revenues on 4,700,000 kWh/yr</b></li> <li>• PPA @ \$.035/kWh \$164,500</li> <li>• State prod. pmt @ \$.015/kWh \$ 70,228</li> <li>• <b>Total Revenues</b> \$234,728</li> <li>• <b>Expenses</b></li> <li>• Mgmt fee \$ 22,500</li> <li>• Service warrantee \$ 22,000</li> <li>• Elec. usage \$ 1,000</li> <li>• Land lease \$ 4,000</li> <li>• Insurance \$ 10,000</li> <li>• <b>Total Expenses</b> \$ 59,500</li> <li>• <b>Operating Cash</b> \$175,228</li> <li>• <b>Debt Service</b> \$136,447</li> <li>• Coverage ratio 1.21</li> <li>• <b>Project reserves</b> \$ 38,781</li> <li>• Fed PTC value \$ 79,591 (This value will increase over 10 yrs)</li> <li>• Depreciation value \$105,876 (This value will decrease over 5 yrs)</li> </ul>	<b>Assumptions:</b> Project Cost: \$1,283,334 Debt: \$958,344 @ 7% int, 10 yr term Equity: \$325,000
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## 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

## Contract-For-Differences for Wind Power

