

# Cost of Renewable Energy Spreadsheet Tool (CREST) Webinar: NREL's Finance Team

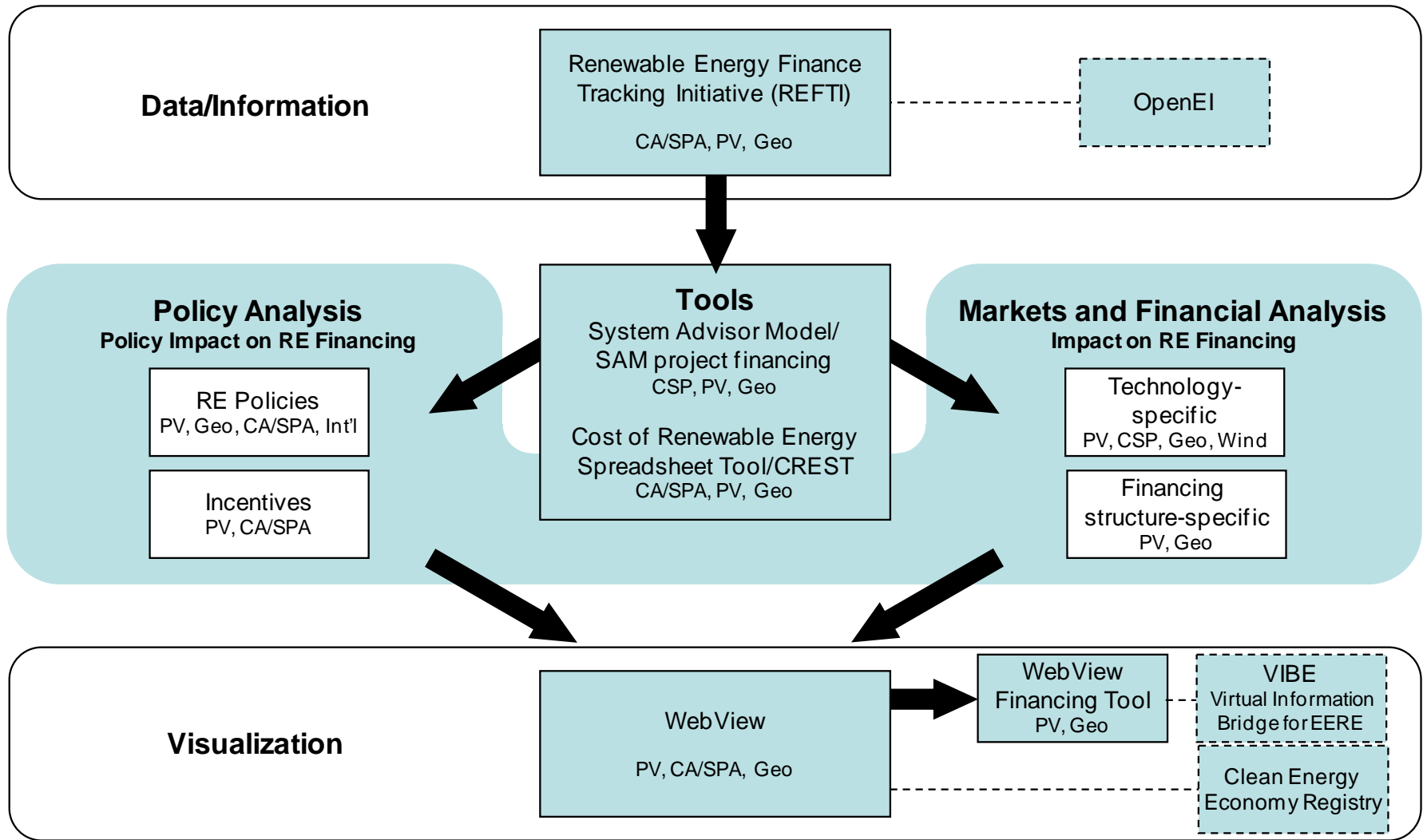


**Clean Energy States  
Alliance Webinar**

**Michael Mendelsohn  
*Senior Financial Analyst***

***February 25, 2011***

# NREL Finance Team Activities, by Activity Type

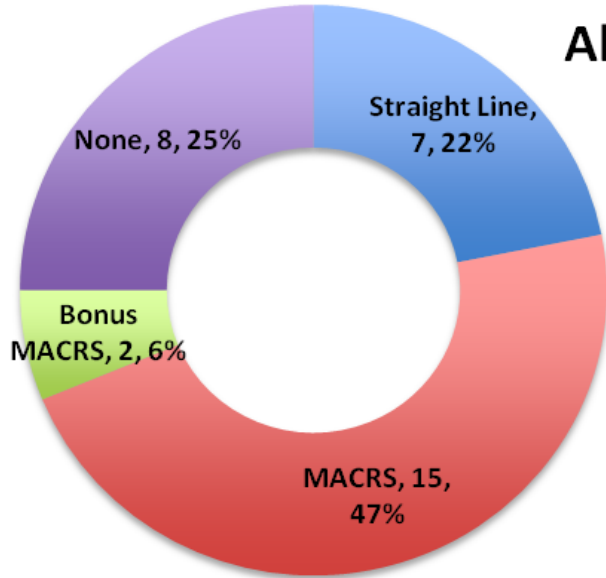


# RE Finance Tracking Initiative (REFTI)

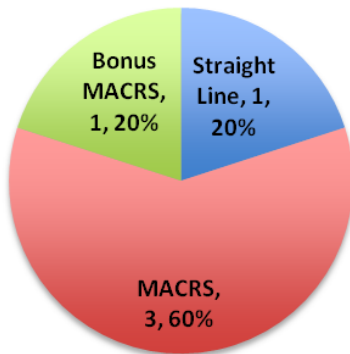
## Form of Depreciation Taken

MACRS depreciation applied in roughly half of projects reported (32 participants responding)

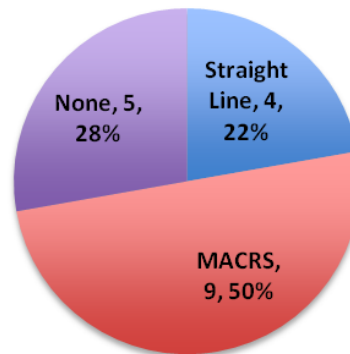
### All Technologies



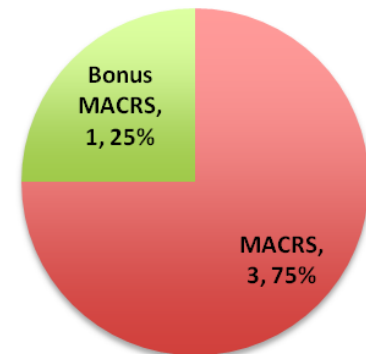
### Wind



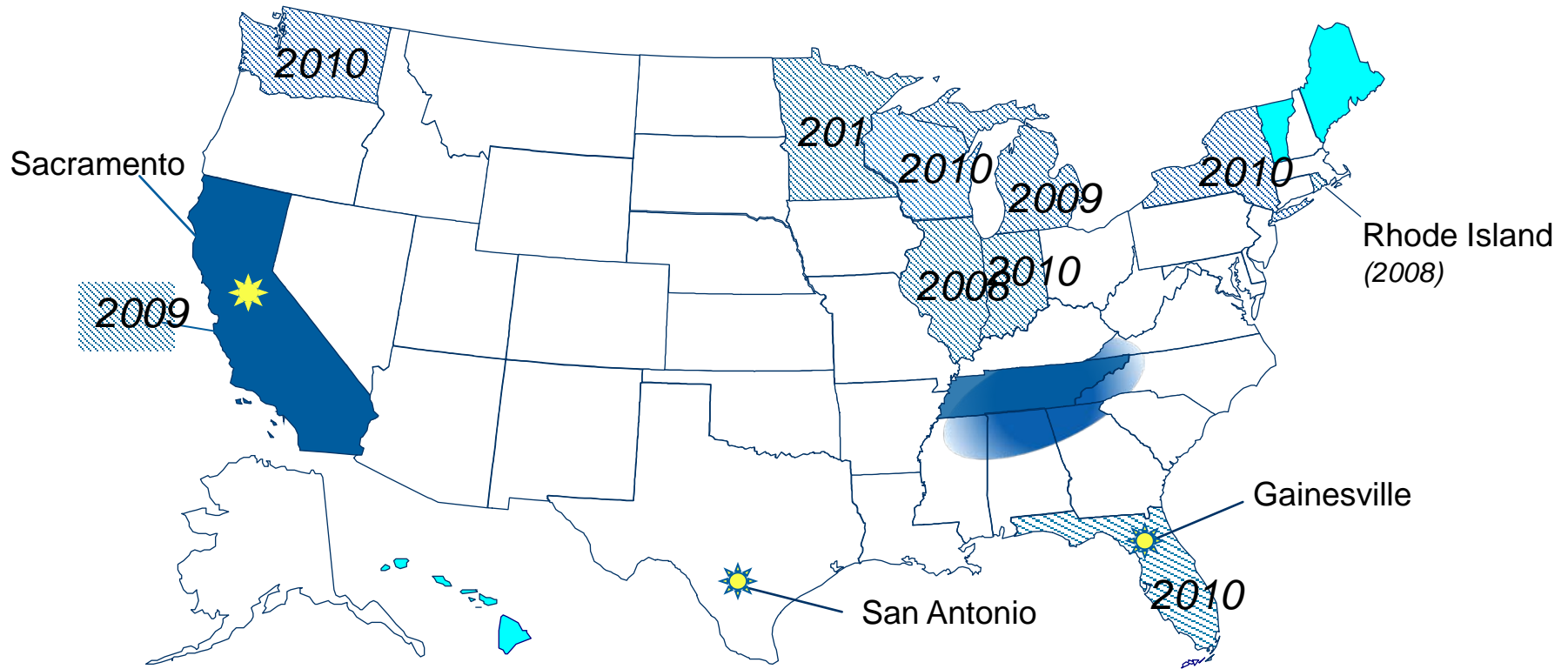
### PV < 1 MW



### PV >= 1 MW



# FIT Policies and Proposals in the U.S.



- 3 states enacted FIT policies based on RE project cost  
(VT, HI, ME (but with a rigid payment level cap))
- 1 state/ 1 federal agency enacted FIT policies based on avoided cost  
(CA, Tennessee Valley Authority)
- 10 states proposed FIT legislation based on RE project cost (CA, FL, IL, IN, MI, MN, NY, RI, WA, WI)  
(Year last proposed)
- Solar FIT policies approved by municipal utilities

Source: Adapted from Gipe 2010, Oregon PUC 2010.

# Tools - System Advisor Model

SAM 2009.10.2: Sample Parabolic Trough Systems.zsam

File Case Results Developer Help

100 MW Baseline w 6hrs TES | 100 MW Baseline w 6hrs - Dry Cooled | 100 MW Baseline - Parameterized Storage

Select Technology and Market... [ CSP Parabolic Trough, Utility IPP ]

**Climate**  
 Location: DAGGETT, CA  
 Lat: 34.9 Long: -116.8

**System Summary**

**Financing**  
 Analysis: 30 years

**Tax Credit Incentives**  
 Fed. ITC

**Payment Incentives**

**Annual Performance**  
 Degradation: 0 %  
 Availability: 94 %

**Trough System Costs**  
 Total: \$ 790,421,119.03

**Solar Field**

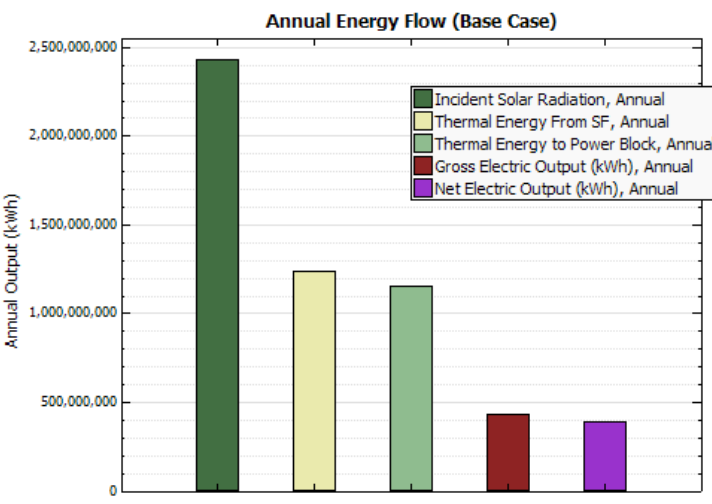
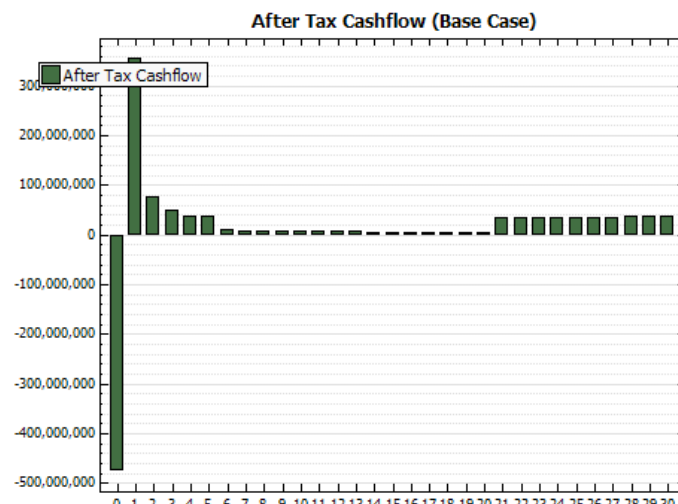
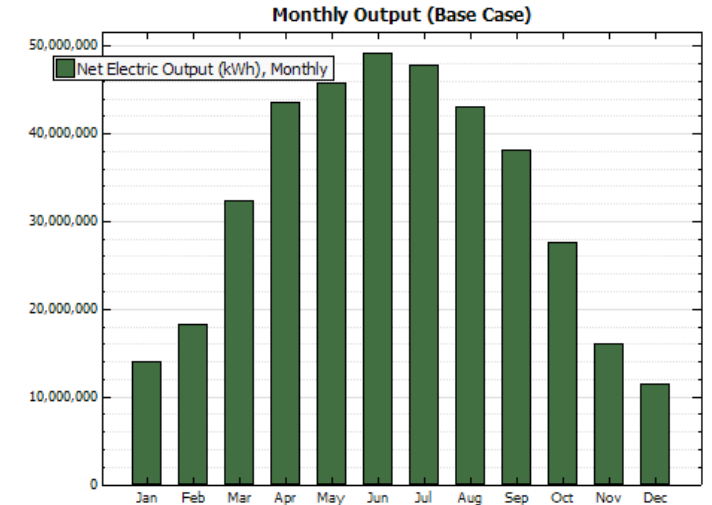
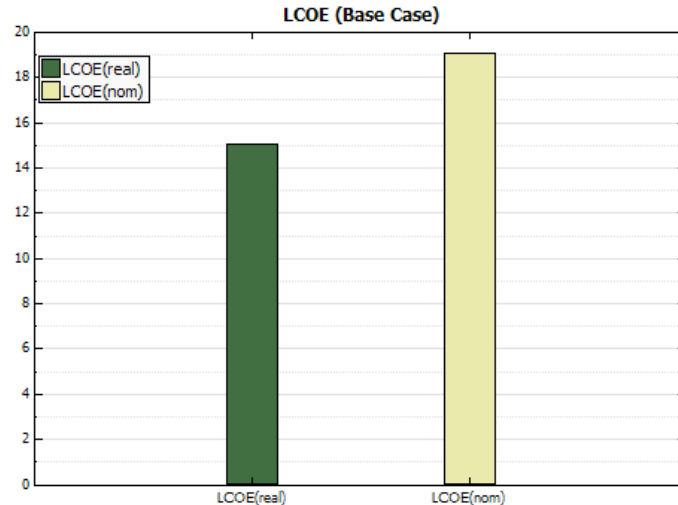
**SCA/HCE**

**Power Block**

**Thermal Storage**

**Parasitics**

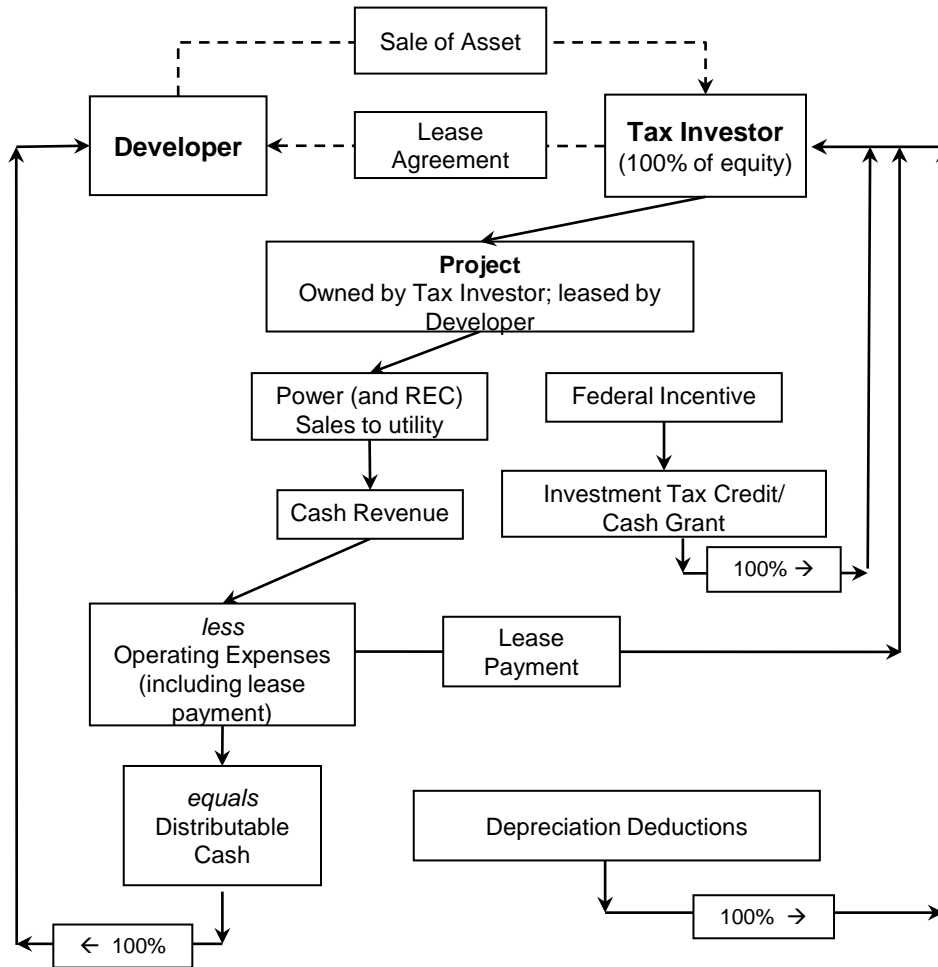
**User Variables**



Navigation icons: Home, Back, Forward, Refresh, Print, Help

# Advanced Financial Structures

## Sale Leaseback



## Structure Details:

- Developer constructs project and sells 100% to Tax Investor.
- Developer (Lessee) leases the project back from Tax Investor (Lessor).
- Lessee operates the project and pays Lessor an annual lease payment. Lease payment sized to provide Lessor with target return.
- Lessee retains free cash flow after lease payments and operating costs.
- Lessor receives annual lease payment from Lessee, and tax incentives and depreciation from ownership of project assets.
- Each party to the transaction has a separate taxable income (project taxable income is not shared as in the Partnership Flip Structures).

# Financial Information Portal

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### Welcome

The Renewable Energy Project Finance community is your guide to project financing, market issues, and policies.

This site features:

- A comprehensive [Resource Database](#) filled with reports, presentations, and tools on financing topics
- Featured [case studies and analysis](#) on the current state of the market
- A [weekly blog](#) highlighting analysis from NREL
- An [upcoming events](#) listing from a variety of conference and Webcast organizers.

Directly below this text, you will find the portal to our Resource Database, which is navigated by selecting the filters or typing keywords that interest you.

### PPA Checklist for State and Local Governments

This fact sheet provides information and guidance on the solar photovoltaic (PV) power purchase agreement (PPA), which is a financing mechanism that state and local government entities can use to acquire renewable energy.



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# CREST - Development

Borne from DOE –  
NARUC Partnership:  
Saw need for simple  
yet robust tool

Simple Total Project Costs	Depreciation Category				
	\$	% Eligible for ITC	A	B	C
Capital Costs	\$ 23,000	95%	90%	5%	5%
Interconnection Costs	\$ 6,000	68%	90%	5%	5%
Development Costs	\$ 7,000	25%	90%	5%	5%
Financing Costs	\$ 24,000	25%	90%	5%	5%
<b>Total</b>	\$ 60,000				
<b>Weighted Average</b>		56%	90%	5%	5%

Total Project Costs Using Worksheets	Depreciation Category				
	\$	% Eligible for ITC	A	B	C
Capital Costs	\$ 23,000	95%	90%	5%	5%
Interconnection Costs	\$ 6,015	95%	90%	5%	5%
Development Costs	\$ 7,021	95%	90%	5%	5%
Financing Costs	\$ 24,276	95%	90%	5%	5%
<b>Total</b>	\$ 60,312				
<b>Weighted Average</b>		95%	90%	5%	5%

Development Costs	Depreciation Category				
	\$	% Eligible for ITC	A	B	C
Contractor's Fees and Profit	\$ 1,000	95%	90%	5%	5%
Permitting Costs	\$ 1,001	95%	90%	5%	5%
Engineering Costs	\$ 1,002	95%	90%	5%	5%
Resource Studies	\$ 1,003	95%	90%	5%	5%
placeholder	\$ 1,004	95%	90%	5%	5%
placeholder	\$ 1,005	95%	90%	5%	5%
placeholder	\$ 1,006	95%	90%	5%	5%
<b>Total Project Capital Cost/Weighted Average</b>	\$ 7,021	95%	90%	5%	5%

Capital Cost Inputs	Depreciation Category				
	\$	% Eligible for ITC	A	B	C
Equipment Costs					
Cost, incl. tower, SCADA, cold weather, commission	\$ 1,000	95%	90%	5%	5%
A	\$ 1,000	95%	90%	5%	5%
Sales Tax, if applicable	\$ 1,000	95%	90%	5%	5%
Lighting	\$ 1,000	95%	90%	5%	5%
Lift	\$ 1,000	95%	90%	5%	5%
Portation to Site	\$ 1,000	95%	90%	5%	5%
Equipment-related Contingency	\$ 1,000	95%	90%	5%	5%
placeholder	\$ 1,000	95%	90%	5%	5%
placeholder	\$ 1,000	95%	90%	5%	5%
placeholder	\$ 1,000	95%	90%	5%	5%
Balance of Plant					
ze	\$ 1,000	95%	90%	5%	5%
Surveys	\$ 1,000	95%	90%	5%	5%
Excavation & Grub	\$ 1,000	95%	90%	5%	5%
Site Preparation	\$ 1,000	95%	90%	5%	5%
Access Road	\$ 1,000	95%	90%	5%	5%
Foundations	\$ 1,000	95%	90%	5%	5%
WTG Installation	\$ 1,000	95%	90%	5%	5%
Engineering	\$ 1,000	95%	90%	5%	5%
Sales Tax, if applicable	\$ 1,000	95%	90%	5%	5%
placeholder	\$ 1,000	95%	90%	5%	5%
placeholder	\$ 1,000	95%	90%	5%	5%
placeholder	\$ 1,000	95%	90%	5%	5%
<b>Total Project Capital Cost/Weighted Average</b>	\$ 23,000	95%	90%	5%	5%