
Financing Solar...Hard Times?

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Electricity Markets and Policy Group • Energy Analysis Department



Background on LBNL Team

- The Electricity Markets & Policy Group works collaboratively with the DOE, other Labs, state and federal policymakers, electric suppliers, renewable energy firms, and others to:
 - Ø evaluate state and federal renewable energy policies and provide expert assistance in policy design
 - Ø analyze the markets for and economics of various renewable energy sources
 - Ø examine the benefits and costs of increased market penetration of renewable energy technologies
- Our emphasis is on renewable generation, with a primary focus on wind and solar power
- Core Staff: Ryan Wiser, Mark Bolinger, Galen Barbose, Andrew Mills, and Ben Hoen

Recent Finance Publications



ERNEST ORLANDO LAWRENCE
BERKELEY NATIONAL LABORATORY

Wind Project Financing Structures: A Review & Comparative Analysis

John P. Harper, Birch Tree Capital, LLC
Matthew D. Karcher, Deacon Harbor Financial, L.P.
Mark Bolinger, Lawrence Berkeley National Laboratory

Environmental Energy
Technologies Division

September 2007

September 2007 wind finance report
available at:

<http://eetd.lbl.gov/EA/EMP/reports/63434.pdf>

January 2009 PV finance report
available at:

<http://eetd.lbl.gov/ea/emp/reports/lbnl-1410e.pdf>



ERNEST ORLANDO LAWRENCE
BERKELEY NATIONAL LABORATORY

Financing Non-Residential Photovoltaic Projects: Options and Implications

Mark Bolinger, Lawrence Berkeley National Laboratory

Environmental Energy
Technologies Division

January 2009



Presentation Outline

1) Looking Back – Two Recent Victories

- **September 2008:** The end of a good run....
- **October 2008:** The Energy Improvement and Extension Act of 2008 (part of the TARP bill)
- **February 2009:** The American Recovery and Reinvestment Act of 2009 (the “stimulus bill”)

2) Looking Ahead – Remaining Issues

September 2008 Finance Outlook: Rather Bleak

Federal Incentives:

- Looming end-of-2008 expiration of residential ITC and 30% commercial ITC
- Residential ITC capped at \$2000
- Commercial ITC unavailable to utilities
- Both ITC's subject to the AMT
- Both ITC's reduced for "subsidized energy financing"

State Incentives:

- State PV rebate programs out of funds, and/or raided to fill state budget gaps

Equity:

- Commercial (and increasingly residential) market highly dependent upon passive third-party tax equity investors
- Credit crisis causing tax equity investors to flee the market, or else charge significantly more for their equity capital

Debt:

- Relatively little project-level debt used, due to incentive structure (hard to leverage) and preference of tax equity investors to avoid "inter-creditor" issues

October 2008 Finance Outlook: Good News (But Barriers Remain)

Federal Incentives:

- End-of-2008 expiration of residential ITC and 30% commercial ITC **NOW THRU 2016!**
- Residential ITC capped at \$2000 **\$2000 CAP REMOVED (FOR PV)**
- Commercial ITC unavailable to utilities **UTILITY PROHIBITION REMOVED**
- Both ITC's subject to the AMT **FULL AMT RELIEF**
- Both ITC's reduced for "subsidized energy financing"

State Incentives:

- State PV rebate programs out of funds, and/or raided to fill state budget gaps

Equity:

- Commercial (and increasingly residential) market highly dependent upon passive third-party tax equity investors
- Credit crisis causing tax equity investors to flee the market, or else charge significantly more for their equity capital

Debt:

- Relatively little project-level debt used, due to incentive structure (hard to leverage) and preference of tax equity investors to avoid "inter-creditor" issues

February 2009 Finance Outlook: Nirvana (?)

Federal Incentives:

- End-of-2008 expiration of residential ITC and 30% commercial ITC **NOW THRU 2016!**
- Residential ITC capped at \$2000 **\$2000 CAP REMOVED (FOR PV AND SHW)**
- Commercial ITC unavailable to utilities **UTILITY PROHIBITION REMOVED**
- Both ITC's subject to the AMT **FULL AMT RELIEF**
- Both ITC's reduced for "subsidized energy financing" **PENALTY REMOVED**

State Incentives:

- State PV rebate programs out of funds, and/or raided to fill state budget gaps **\$3.1 BILLION TO STATE ENERGY PROGRAMS**

Equity:

- Commercial (and increasingly residential) market highly dependent upon passive third-party tax equity investors **FEDERAL 30% GRANT PROGRAM**
- Credit crisis causing tax equity investors to flee the market, or else charge significantly more for their equity capital **5-YEAR CARRY-BACK (FOR SOME)**

Debt:

- **Relatively little project-level debt used, due to incentive structure (hard to leverage) and preference of tax equity investors to avoid "inter-creditor" issues STILL HARD TO LEVERAGE, BUT INTER-CREDITOR ISSUES LESS IMPORTANT**



Remaining Issues (I)

Federal Grant Program:

- **Only available to commercial projects:** Residential projects must still take the ITC
- **Only temporary:** Available to projects that commence construction in 2009 or 2010 (and become operational prior to 2017)
- **Only converts about half of a solar project's tax benefits into cash:** Tax appetite still needed to take advantage of accelerated tax depreciation (5-year MACRS)

Equity:

- **Will tax equity investors participate just for depreciation benefits?**
- **What will replace (or augment) tax equity?**
 - For all its shortcomings, tax equity has been cheap equity (6%-7% after-tax, historically)
 - Other sources – e.g., private equity, utility – may be more expensive

Debt:

- **Still difficult to use much project-level debt:** ~25% leverage possible in CBI states, ~40% possible in PBI states

Remaining Issues (II)

Utilities:

- **What role will utilities play, now that they can use the ITC?**
- **Electric rate design:** PV-friendly tariffs (e.g., based more on energy than demand charges) can maximize the value of behind-the-meter PV

State PV Programs:

- **Zero-Sum Game:** Will states reduce incentive levels in response to enhanced federal incentives?
- **Low-Interest Loans:** Look very attractive now that double-dipping penalty for “subsidized energy financing” has been removed

Transmission: Not just a wind issue; transmission constraints impacting CSP projects in the Southwest

Grid Integration: At higher penetration levels, solar may have more integration challenges than does wind