
Financing Solar...Hard Times?

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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