DOE Technical Assistance Program

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

The Parker Ranch installation in Hawaii

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Rick Toyle, Talbot County MD
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Exploring Power Purchase Agreements -The Basics Part 1

July 27, 2011

1:00 PM- 2:30 PM EST

What is TAP?

DOE's Technical Assistance Program (TAP) supports the Energy Efficiency and Conservation Block Grant Program (EECBG) and the State Energy Program (SEP) by providing state, local, and tribal officials the tools and resources needed to implement successful and sustainable clean energy programs.

How Can TAP Help You?

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TAP offers:

- One-on-one assistance
- Extensive online resource library, including:
  - Webinars
  - Events calendar
  - TAP Blog
  - Best practices and project resources
- Facilitation of peer exchange

On topics including:

- Energy efficiency and renewable energy technologies
- Program design and implementation
- Financing
- Performance contracting
- State and local capacity building

The TAP Blog

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Access the TAP Blog!

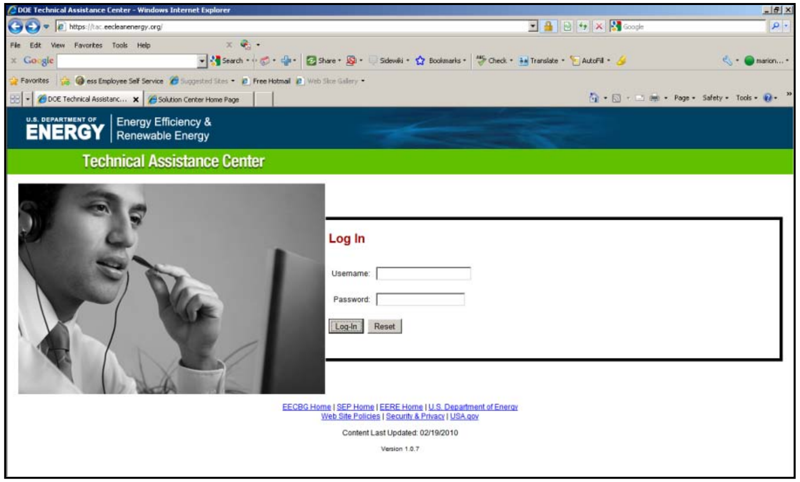
http://www.eereblogs.energy.gov/tap/

Provides a platform for state, local, and tribal government officials and DOE's network of technical and programmatic experts to connect and share best practices on a variety of topics.

We encourage you to:

1) Explore our online resources via the Solution Center

2) Submit a request via the Technical Assistance Center



3) Ask questions via our call center at 1-877-337-3827 or email us at solutioncenter@ee.doe.gov

Upcoming Webcasts

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Webcast	Date	Time
Introduction to Using Community - Wide Behavior Change Programs to Increase Energy Efficiency – Part 1	July 28, 2011	3:00 – 4:15 EST

For the most up-to-date information and registration links, please visit the Solution Center webcast page at www.wip.energy.gov/solutioncenter/webcasts

Agenda

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- **PPA Overview:** Darin M. Lowder, Ballard Spahr, LLP
- Case Studies:
  - **Salt Lake County UT**, Greg Folta , Fiscal Administrator, Kimi Barnett , Environmental Coordinator
  - **Talbot County MD**, Rick Towle, Director of Parks & Recreation

  - **Q & A**

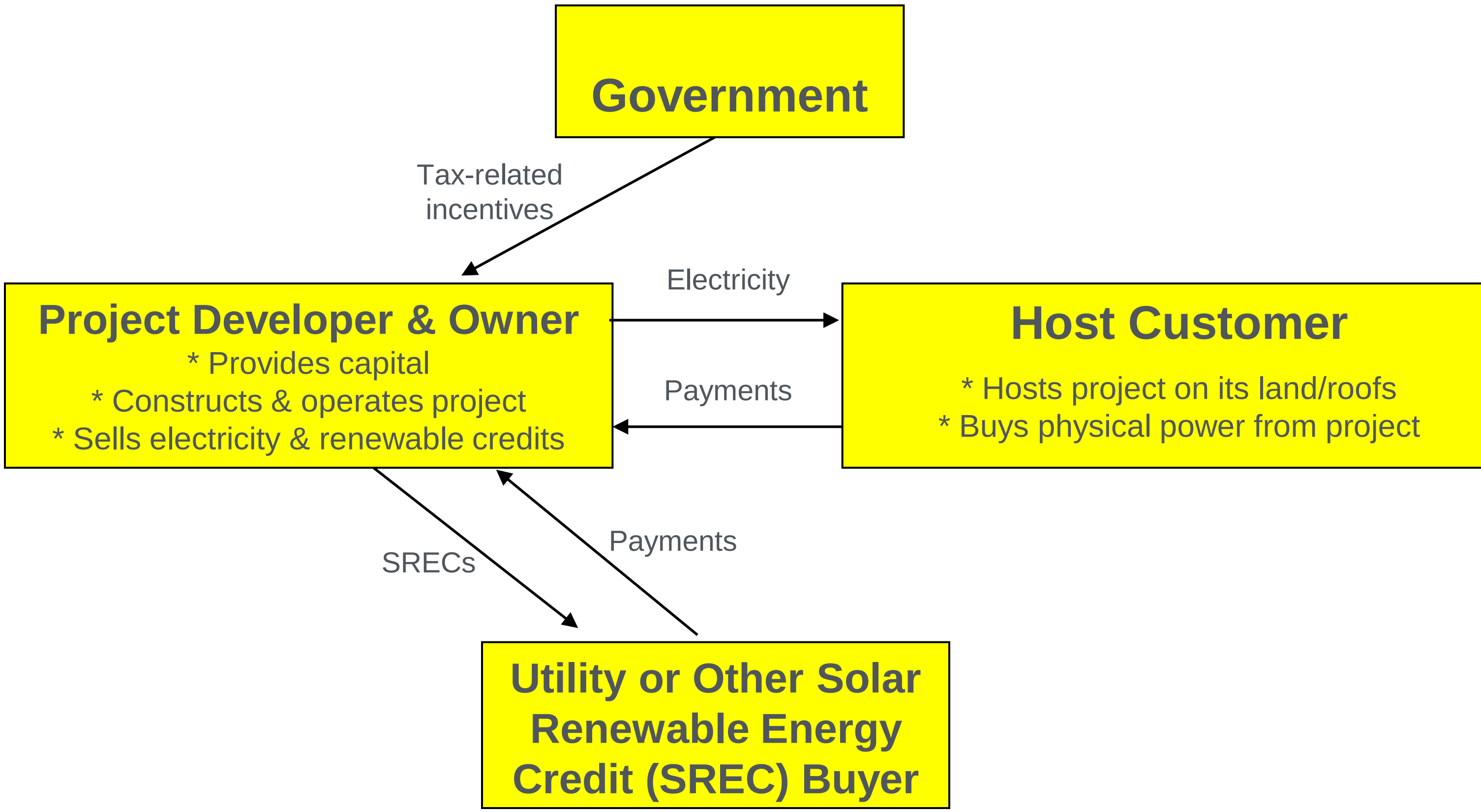
Renewable Energy Power Purchase Agreement (PPA) Background

Power Purchase Agreements: What is it?

Description of PPA

- Under a power purchase agreement, a private entity (or group of developers, construction contractors, and finance companies) typically installs, owns, operates and maintains a renewable energy project “behind the meter” on a customer’s site.
- Customer purchases electricity or thermal energy through a long-term contract with fixed energy pricing (either fixed for the term, or rising each year at a pre-determined rate). Payment is only made for thermal or electric energy actually delivered.
- Private ownership of the renewable energy equipment enables the project to qualify for federal and state tax incentives unavailable to non-taxpaying entities.

Incentives / Flow of Funds



Power Purchase Agreements: What is it?

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Obligations

- Provider typically has obligation to finance and construct project, operate, and deliver energy
- Minimum outputs may be specified (failure to deliver results in penalties or “make whole” provisions)
- Customer has obligation to take and pay for all power delivered
- Ownership of renewable energy attributes (RECs or SRECs) is negotiable, and may be sold separately from energy output

Power Purchase Agreements: Why and How?

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Why

- Moves construction, development, operations & financing burden to third-party
- Maximizes financial and tax incentives
- Public-private collaboration possible
- Facilitates renewable energy development that may not otherwise occur, providing environmental, educational, financial, economic development (e.g., green jobs) benefits to the community

How

- Competitive procurement (RFP or RFQ/RFP)
- Specific project or open invitation to bid
- Add-on through master energy performance contracts
- Alternatives: customer may propose key terms or seek form PPA from provider

Risk-Sharing

- Risk to public property
- Project completion risk
- Schedule risk
- Losing financial incentives (grants, rebates)
- Change in law
- Loss of use of project site by Customer (convention center)
- Decrease in solar resources (allowing a building to block sun)
- PPA must continue through financing term
- Risk of lower future power prices

Power Purchase Agreements: Unique Issues

Specific Requirements for Public Customers

- Open records laws
- Boilerplate (EEO, Political Contributions, Local Hiring)
- Limits on long-term contractual commitments
- Non-appropriation risk
- Waiving sovereign immunity
- Taxation – of real & personal property (abatement?)
- Limits on leasing project site
- Insurance requirements (self-insured?)
- Approvals (City/County Council, Committee, Resolution)

Tax Issues

- Deadlines:
  - For 1603 Grant (big issue), construction must "commence" no later than 2011 and be completed by the end of:
    - 2012 for Wind
    - 2013 for Biomass, Landfill Gas, Waste-to-Energy
    - 2016 for Solar, Small Wind
- Who owns the system (according to the IRS)?
  - Control, risk of damage, benefits & burdens of ownership
- Risk of Recapture of federal tax benefits

Power Purchase Agreements: Financing Issues

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Financing

- Step-in rights for lenders to operate project
- Consent to assignment of PPA
- Results of customer default (requirement to remain in place or be removed – at whose cost?)
- Financing lien on system property (the project – not the underlying real property, land, or other improvements)
- Documents recorded in full or in memorandum form

Power Purchase Agreements: Business Terms

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Business Terms

- Energy pricing – output guarantee?
- System size variation
- PPA lease renewal (beyond normal 15-20 year initial term)
- Purchase option pricing & timing
- Performance / completion bonds (construction, removal)
- Costs of interconnection
- Customer-caused temporary outages (roof replacement)
- Billing and payment
- Claiming/promoting green attributes of system

Public-Private Partnership: Salt Lake County As An Example of the Possible

Salt Lake County's PPA Experience - Solar

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Challenges

- Pricing
  - Low power costs
  - Low solar subsidies
  - Political gatekeepers
- Regulatory Structure
  - No 3rd-Party Ownership initially
  - Utility pricing insufficient

Salt Lake County

Assets

- AAA Credit Rating
- $6 mm in QECB allocation
- $1.8 mm in DOE Grants
- Convention Center located in New Market-eligible location
- Avid Political Support

First: the Financing Study (2008)

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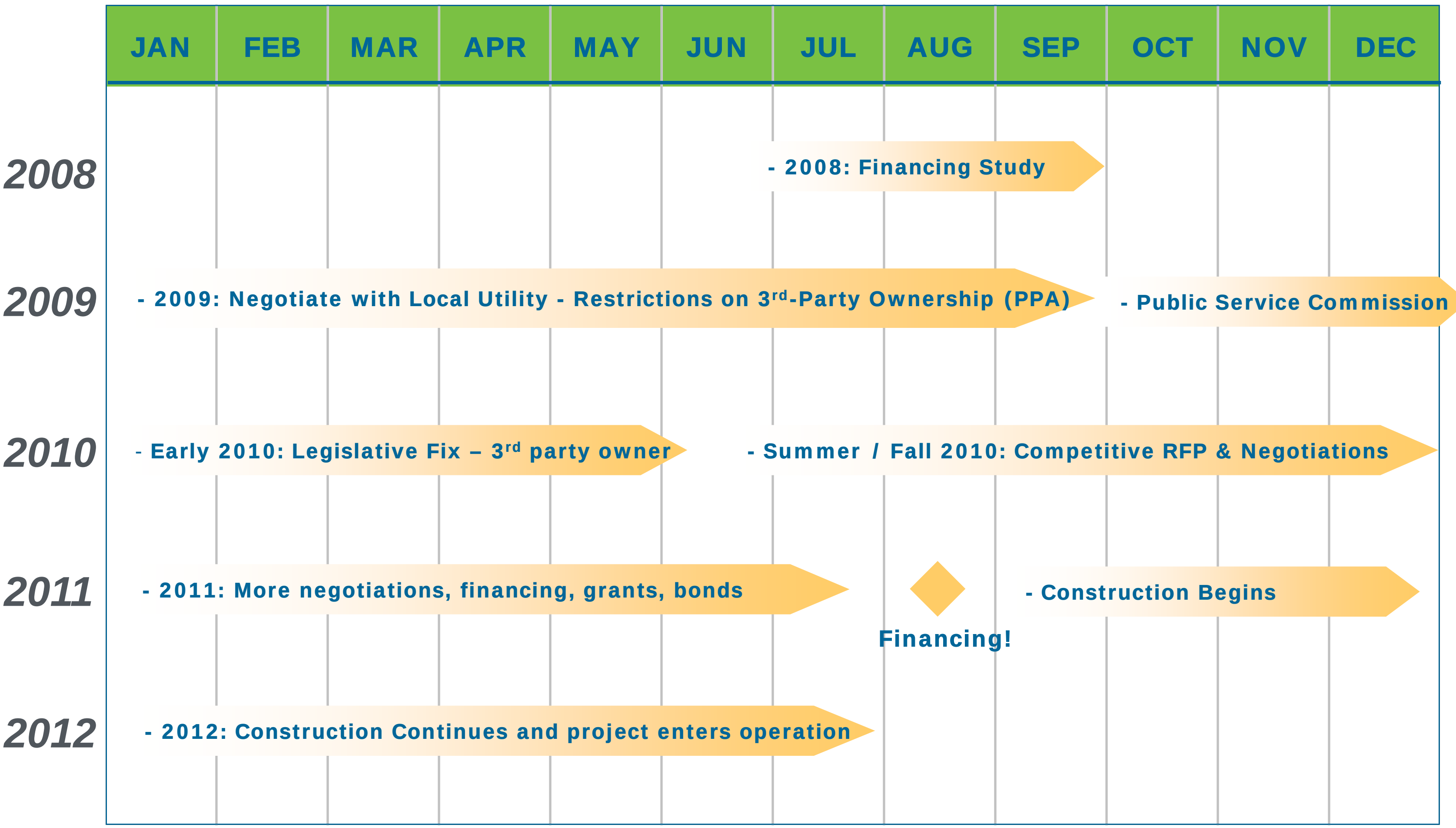
Financing Options	Construction Cost per watt installed		
	Base Case** ($8.50 / watt)	Lower-cost $7.00 / watt	Lowest-cost $6.00 / watt
CREBs	$0.29 / kWh	$0.22 / kWh	$0.17 / kWh
Tax-exempt financing	$0.38	$0.29	$0.23
Private owner with ITC	$0.23	$0.17	$0.13
NMTC – no ITC (3.75% debt)	$0.29	$0.22	$0.17
NMTC – with ITC	$0.19	$0.13	$0.10

*These costs represent the additional levelized net costs of power per kilowatt-hour over the expected life of the system (above current electricity costs), incorporating the value of future carbon credits, costs of personal property taxes, the value of solar RECs (a value of zero is assumed for Utah solar RECs because Utah currently has no mandatory RECs market), a 10% state renewable corporate tax credit capped at $50,000, and power cost savings, assuming that utility rates increase at 3.5% per year.
**At a cost of $6.00 per installed watt, installing a 1 MW system would cost roughly $6.0 million.

Timeline: It’s a Marathon



It Gets Better With Age

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Since the project started in 2008:

- Costs of solar panels dropped by 40%+
- Rules against subsidized energy financing were removed
- Qualified Energy Conservation Bonds were created and expanded
- ARRA provided Salt Lake County with energy efficiency and conservation block grant funds
- New markets credits were expanded

Results

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Successful Project RFP in Summer 2010, incorporating:

- 1603 Grant in lieu of credit (assumed)
- New market tax credit debt / financing structure
- Qualified Energy Conservation Bond proceeds lent to private developer (up to $1.9 mm)
- US DOE grant funds
(EECBG and other funds totaling $1.8 mm)
- **Resulting in:** 2.65 MW system at $0.075 / kWh first year, purchase option in future years (offset by County loan to project)
- Project financing to close in August 2011
- Construction begins in August/September and project will be completed in 2012

Renewable Energy Financing Fundamentals

Providers: Sources of Financing

- Debt
- Equity
- Tax equity
- Monetizing federal incentives
- Public-private partnerships
- State, local governments, and utility incentives

Financing Future Benefits – Solar Example

- Since about 40%-55% of a solar project's value represents the value of future electric generation, these benefits are often financed with long-term debt (10+ years).
- About 40% or more of a solar project's value represents tax benefits that may be realized from between 60 days (in the case of the federal grant in lieu of ITC) to 5 years (in the case of accelerated depreciation) from the date the system becomes operational; projects are often financed through equity investments or short-term debt.
- State incentives such as rebates or renewable energy certificates are often received when the system becomes operational, and may represent 5-20% of a project's value (or much more in the case of states with very high incentives such as NJ, PA, MD, OR, or CA).

Availability of Incentives to Non-Taxpayers

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Incentive	Available to non-taxpayer?	When Available?
State Rebate	Yes	At Project Completion
State Tax Credit	No	At Project Completion
Federal 30% Investment Tax Credit	No	At Project Completion
Federal Accelerated Depreciation	No	Over First 5 Years
Value of Electricity (low or high)	Yes	Life of Project
State Solar REC	Yes	Life of project

Talbot County Project Sunburst

Talbot County Department of Parks & Recreation
Private/Public Partnership
July 12, 2011

Talbot County Information

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Local Climate

- Population of 37,000
- Greater than national average in income
- Demographics have a greater than national average in median age.
- Fiscally conservative
- Tax Cap

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Buy or Sell?

Power Purchase Agreement

Create A Power Source

Hybrid Situation

Clean, Green, and Sustainable

RFP for Me?

- Green approach
- Financial advantages
- Competitive process
- Creates PPA demand
- First time experience
- Community Buy In
- Long-term relationship

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Talbot County RFP AD

TALBOT COUNTY, MARYLAND PUBLIC NOTICE
INVITATION TO SUBMIT PROPOSALS

TITLE: Power Purchase of Renewable Energy (Photovoltaic) Contract Project Sunburst Grant

BID NO.: 10-18

Sealed Proposals shall be accepted by the County Manager of Talbot County, Courthouse, 11 N. Washington Street, Easton, Maryland, 21601 until 10:00 a.m. on Wednesday, July 7, 2010, at which time they shall be opened and read aloud.

The Scope of Work consists of the design, preparation of construction plans and specifications, construction supervision, etc. related to the proposed solar photovoltaic system at the Talbot County Community Center. The work shall be performed under the direction of a County Council approved firm(s) with specified documented experience in the design of similar systems placed at public facilities. The scope of the work and schedule is specifically defined in the solicitation documents. Potential bidders must adhere to all conditions and requirements of the American Recovery and Reinvestment Act of 2009. Design and preparation of construction plans and specifications shall be performed and completed within specified deadline of a fully functional system no later than April 1, 2011 once given the Notice to Proceed.

The Request for Proposal and Other Contract Documents may be obtained at the Talbot County Depart-ment of Parks & Recreation, 10028 Ocean Gateway, Easton, Maryland 21601 [(410)770-8050]; at a nonrefundable cost of $25.00 per set (payable to the Talbot County Finance Office).

Talbot County, Maryland reserves the right to reject any or all proposals or to accept any proposal, or portions thereof, when in their judgment, the public will be better served.

TALBOT COUNTY DEPARTMENT OF PARKS & RECREATION

TALBOT COUNTY PARKS & RECREATION DEPARTMENT OF

Picking Your Partner

- Experience
- Ability
- Financial Stability
- Legal Background
- Team Approach
- Communication

Maryland Energy ADMINISTRATION
Powering Maryland's Future

NautilusSolar

MERCURY SOLAR SYSTEMS

TALBOT COUNTY DEPARTMENT OF PARKS & RECREATION

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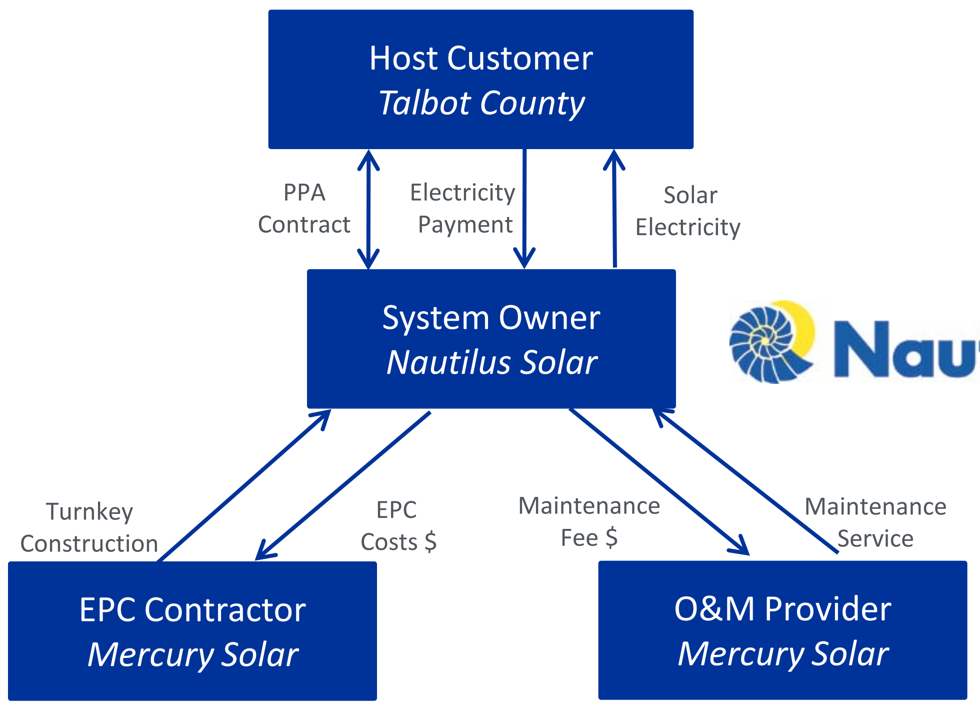
Talbot Project Team Roles

- Nautilus Solar is the system owner and is responsible for executing the PPA and financing the project
- Mercury Solar Systems is the turnkey EPC contractor and will also be under contract for the operations & maintenance

Talbot County PPA Structure



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Talbot Solar Layout

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NOTES:
Ground-mounted System
- Panel Type and Quantity: (2,392) Schott Poly 230
- Racking System: Schletter FS-2V
- Recommended Inverter(s): (2) PV Powered PVP 260kW
- DC Power Output: 550.16 kW
- Panel Tilt: 30°
- Azimuth: 180°
- Array Area: 88,500 sqft

TALBOT COUNTY PARKS & RECREATION DEPARTMENT OF

MERCURY SOLAR SYSTEMS
36 Midland Ave
Port Chester, NY 10573
(P) 914-637-9700
(F) 914-637-9713

Talbot County Community Center
10028 Ocean Gateway
Easton, MD 21601

Drawn By: WC	Date: 7/30/2010
Checked By: ---	LAYOUT
Scale: N.T.S.	Rev. #12
Project # 008957	Rev Date: 12/13/2010

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Talbot System Design Summary

- 550 kW DC PV System
- 2,392 Schott 230-watt modules
- 184 strings
- 2 PV Powered Inverters (2x 260kW)

Station Identification	
City:	Baltimore
State:	Maryland
Latitude:	39.18° N
Longitude:	76.67° W
Elevation:	47 m
PV System Specifications	
DC Rating:	550.2 kW
DC to AC Derate Factor:	0.824
AC Rating:	453.3 kW
Array Type:	Fixed Tilt
Array Tilt:	20.0°
Array Azimuth:	180.0°
Energy Specifications	
Cost of Electricity:	7.8 ¢/kWh

Results			
Month	Solar Radiation ($kWh/m^2/day$)	AC Energy (kWh)	Energy Value ($)
1	2.91	41566	3242.15
2	3.87	49986	3898.91
3	4.57	62943	4909.55
4	5.24	68759	5363.20
5	5.65	74136	5782.61
6	6.25	76118	5937.20
7	6.08	76003	5928.23
8	5.50	68664	5355.79
9	4.84	59241	4620.80
10	4.40	58231	4542.02
11	3.06	40217	3136.93
12	2.38	32932	2568.70
Year	4.57	708797	55286.17

NautilusSolar | Maryland Energy Administration — Powering Maryland's Future | Mercury Solar Systems | Talbot County Department of Parks & Recreation

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<u>Anticipated Results</u>

- $1 to $1.6 Million in savings
- Second Project worth additional $1-1.2 Million
- Community growth in Green Industry
- Project will outlast political climate
- Ancillary Grants will be gained

Results Driven Approach

Lessons Learned

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- RFP's are the foundation for the final result
- PPA's are unique for governmental agencies
- Sharing information works wonders
- Plan out your roles prior to committing
- Develop a timeline for final product
- Require project management meetings in RFP
- Require experience as a factor of award
- Make sure the interconnection is executed
- PARTNERS GIVE to GET EQUALLY

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PPA Alternatives

Typical Applicable Ownership Structures

- If a non-taxpaying entity owns its own buildings, its options would include the following:
  - **Rooftop Lease:** Lease the rooftop to a third party that would own the system and use the power. Customer would receive lease payments for the use of the rooftop space. The income may present some tax issues for the governmental customer.
  - **Rooftop Lease with Power Purchase:** Lease the rooftop to a third party that would own the system, but the Customer would purchase the power from the system at a pre-determined price, often at rates below what the Customer currently pays for power.

Typical Applicable Ownership Structures

- **Public (non-taxpayer) Ownership of System:** The non-taxpayer could purchase the system, place the system on its roof or on adjacent property (such as a parking lot) and receive the power for the life of the system, offsetting current electrical purchases.
- **Energy Savings Performance Contract:** Third-party, private solar project ownership bundled with energy efficiency or other measures.

PPA / Ownership Options Analysis

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Option	Pros	Cons
Rooftop Lease	• Low-risk, no capital requirements • Positive intangible "green" benefit	• non-taxpayer not eligible for solar tax incentives • No asset ownership • No power savings or price hedging • Reduced "green" claims allowed since system not owned
Rooftop Lease with Power Purchase	• Low-risk, no capital requirements • Price hedging or power price savings due to long-term power purchase agreement • Positive intangible "green" benefit	• non-taxpayer not eligible for solar tax incentives • No asset ownership • Reduced "green" claims allowed since system not owned
non-profit Ownership of System	• Higher risk from system ownership / operation • System purchase price requirement • May receive some state incentives (rebates, solar RECs) • Price hedge, "green" benefits	• non-taxpayer not eligible for solar tax incentives • Less likely to see power cost savings due to inability to claim solar tax benefits
Energy Performance Contract	• Rapid procurement rules if master contract already established • Performance guaranteed	• Adds another layer of rules to comply with • Complicates PPA terms (does guarantee period match PPA term?)

Structuring/Financing Options for the Non-taxpayer

- In addition to the typical ownership structures just described, the non-taxpayer also has additional options:
  - **Rooftop Lease with Power Purchase and System Ownership by Related For-Profit Entity with No Debt Financing:** Lease the rooftop to a related third party (for-profit entity related to the non-taxpayer Customer) that would own the system and take advantage of tax credits, but the non-taxpayer would purchase the power from the system at a pre-determined price, often at rates below what the Customer currently pays for power.

Structuring/Financing Options

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– **Rooftop Lease with Power Purchase and System Ownership by Related For-Profit Entity with Innovative Financing:** Using low-cost financing options available under certain circumstances, such as New Markets Tax Credits or low-interest bonds, a related for-profit entity could purchase the system, place the system on the non-profit roof or adjacent property (such as a parking lot) and sell the power to the non-profit building for the life of the system, offsetting current electrical purchases.

Impact of Federal Tax Innovations

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- Ability to elect ITC instead of PTC
- 1603 grant in lieu of ITC extended through 2011
- Under new ITC rules, no penalty for “subsidized energy financing”
- Equipment leases to non-profits allowed under 1603 grant
- New Market Tax Credits extended through 2011
- Accelerated depreciation extended through 2012

Thank You!