



Tinton Falls

Analysis of Solar Options

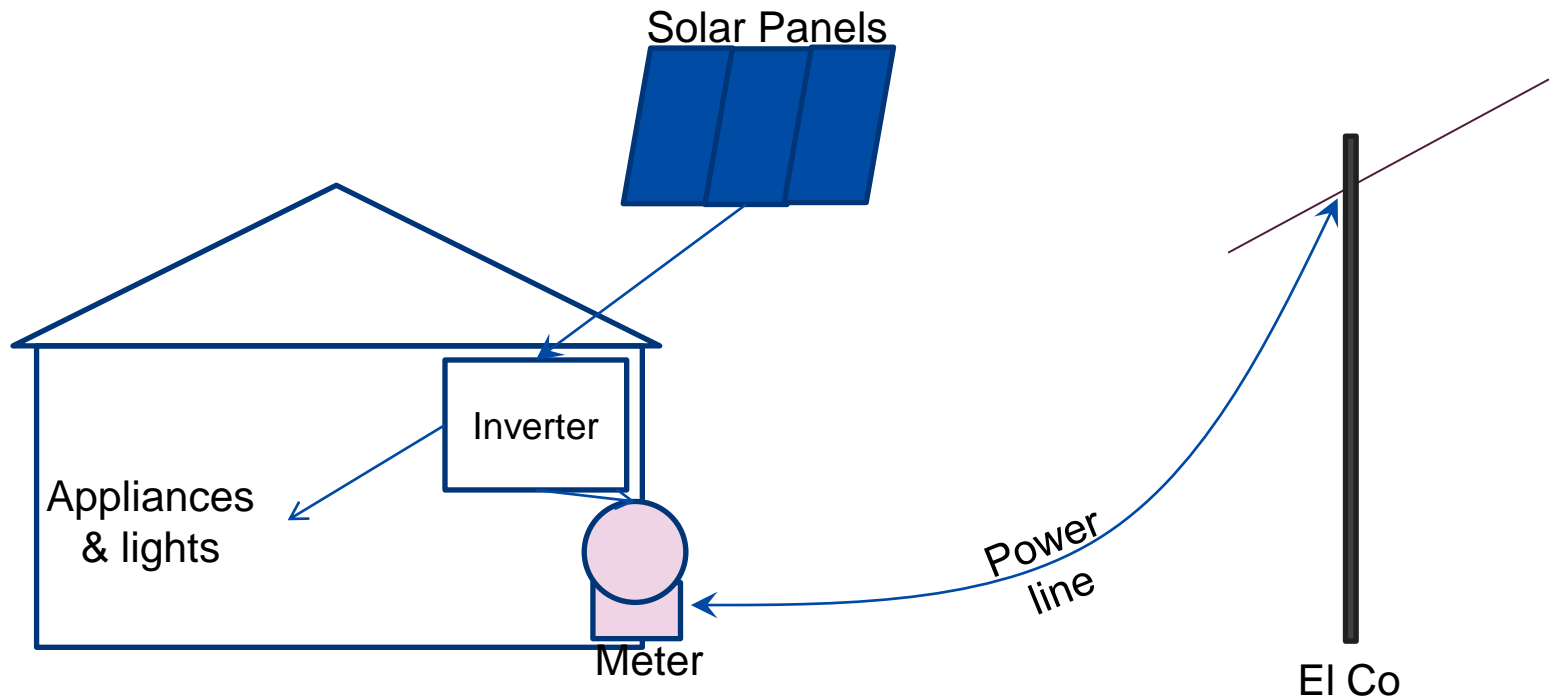
Mr. Rob Mauro, TAC Vice Chair

Mr. Jon Cohan, EC Chair

Dr. Andy Mayer, Council Liaison

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Solar Power Basics



- System Installation Costs
 - \$4.50 - \$5.25 / watt (excl. structural upgrades)
 - Largest component – panel costs
 - panels ~ 50% project cost
 - panel costs - decreased 30% in 2009



Renewable Portfolio Standard (RPS)

- ❖ Signed by Governor; administered by BPU
- ❖ **Goal:** 30% of electricity to be generated from “clean” source by 2025
 - ❖ 2800 megawatts (MW) from solar
 - ❖ As of 5/31/10, over 6,032 New Jersey residential, commercial, public, and non-profit entities have installed a solar electric system
- ❖ Approximately 55 MW behind goal at close of 2009
 - ❖ As a result energy providers were required to pay \$40M in penalties
- ❖ State and Federal financial Incentives have been established to facilitate adoption



Financial Incentives

1. Solar Renewable Energy Credits (SRECs)

- Established by Renewable Portfolio Standard (RPS)
- Sold to state electric suppliers to meet solar RPS requirements
- Provides a means for inclusion of non-utility owned solar panels in state minimum clean energy source requirement
- Increases economic value of investment
- Bundled in minimum denominations of one megawatt hour (MWh)
- Price fluctuates based on market supply and demand
 - Not dependent on value of electricity
 - Traded as high as \$680 in NJ in 2009
 - Guaranteed 15 year life

2. Federal Investment Tax Credit

- 30% of system cost is issued by the Federal Government as a tax credit

3. Accelerated Depreciation

- 5 years



Solar Financing Models

- Purchase
 - Requires Bond, or Capitol Outlay
- Lease
 - Held by Finance Company
- Power Purchase Agreement (PPA)
 - Long-term legal contract between an electricity generator and a site owner to provide solar electricity at guaranteed long-term rates.
 - PPA provider secures funding for the project, maintains and monitors the energy production and sells the electricity to the host at a contractual price for the term of the contract – 10 to 25 years.



Financing Alternatives

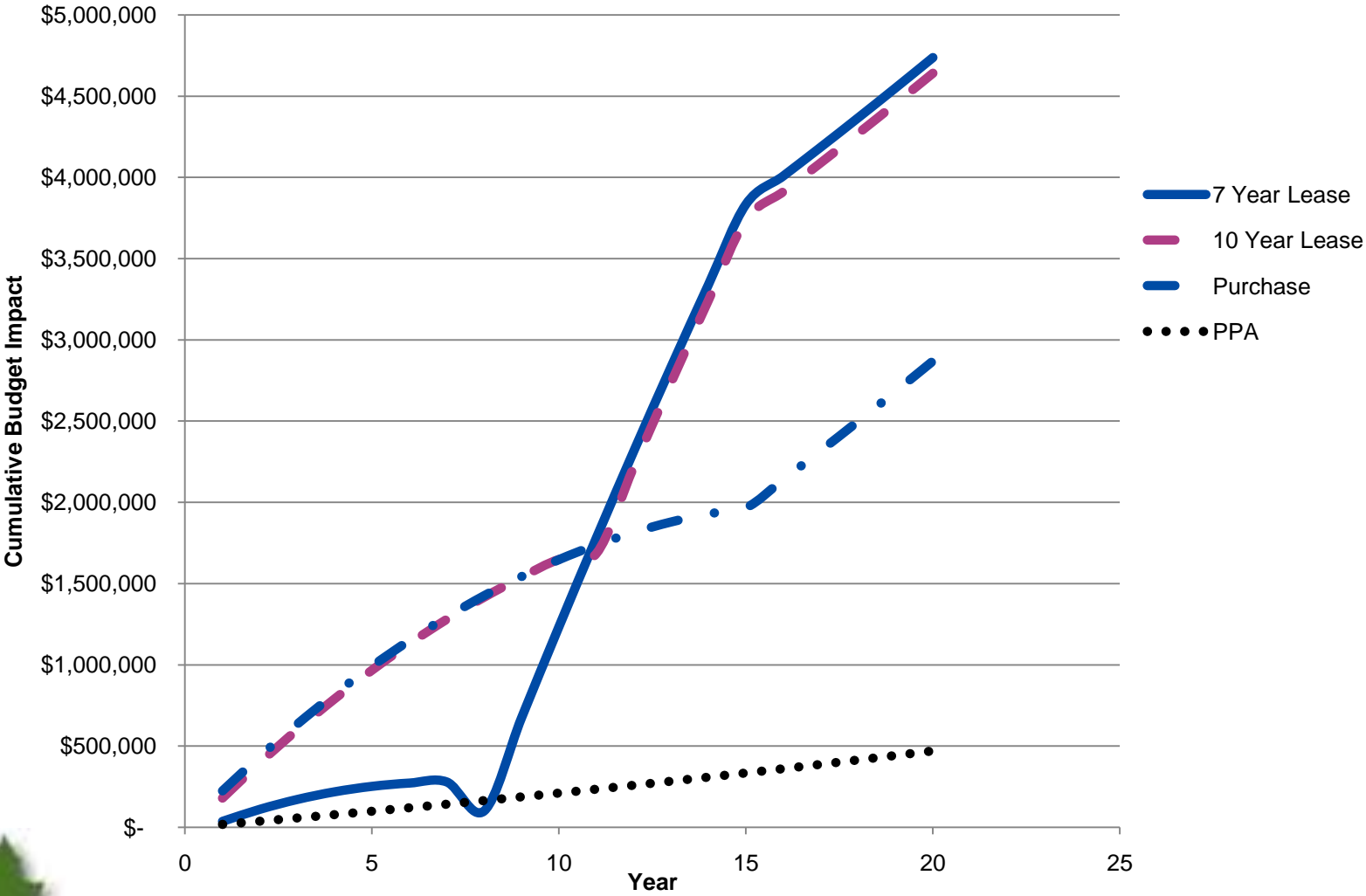
Financing Method	Pros	Cons
Purchase	<ul style="list-style-type: none">•Significant reduction of electric bill starting year 1•Cost of money today is cheap	<ul style="list-style-type: none">•Initial capitol outlay•Cost of financing•No benefit of tax incentives•Operation & maintenance Costs
Lease	<ul style="list-style-type: none">•No upfront costs•Significant reduction of electric bill starting year 1•Indirect benefit of tax incentives	<ul style="list-style-type: none">•Potential for large buyout at end of lease•Operation & maintenance costs
Power Purchase Agreement (PPA)	<ul style="list-style-type: none">•No upfront costs•No operation & maintenance costs•No insurance costs•Indirect benefit of tax incentives	<ul style="list-style-type: none">•Reduced but <i>non-zero</i> cost of electricity

Financial Analysis

<u>Assumptions</u>			
Current Usage (Borough Hall + PW)			1,090,000 KWH
Total Cost		\$	157,000
Electric cost per KHR		\$	0.1440
Size of Installed System (proposed)			1,000,000 W
Installation Cost per Watt		\$	5.10
Total Installation Cost of System		\$	5,100,000
Total Yearly Electric Demand			1,100,000 KWh
Total Supplied by Solar (80%)			880,000 KWh
Total Supplied by Utility (20%)			220,000 KWh
Electric Rate per KWh today		\$	0.144
Expected Annual increase in Electric Rate			2.5%
SRECs @ 1 SREC/1000 KWh of Generated Electricity			880
Today's Average SRES Sale Price		\$	650
Expected Yearly Decrease in SREC Value			3%
Broker Fee			3%
Life of SREC Program			15 yrs



Cumulative Budget Impact

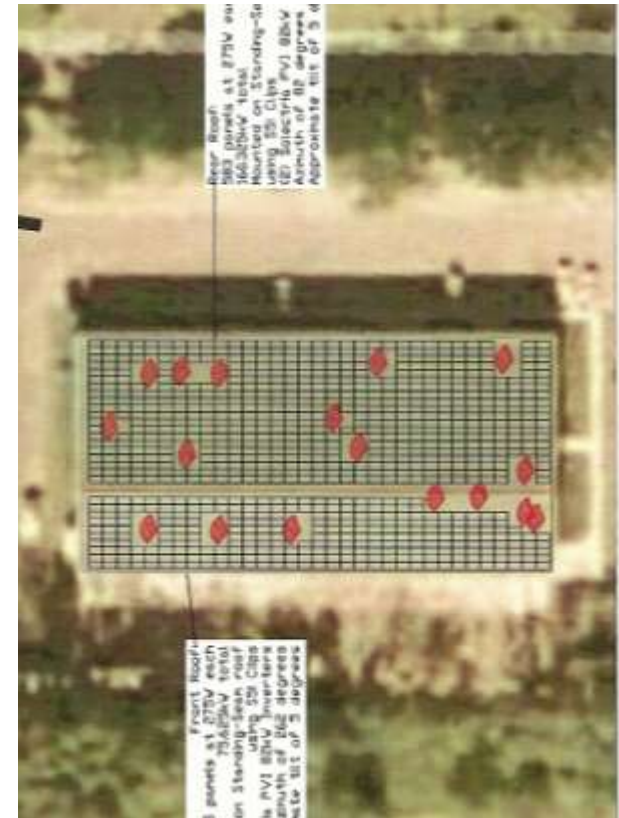
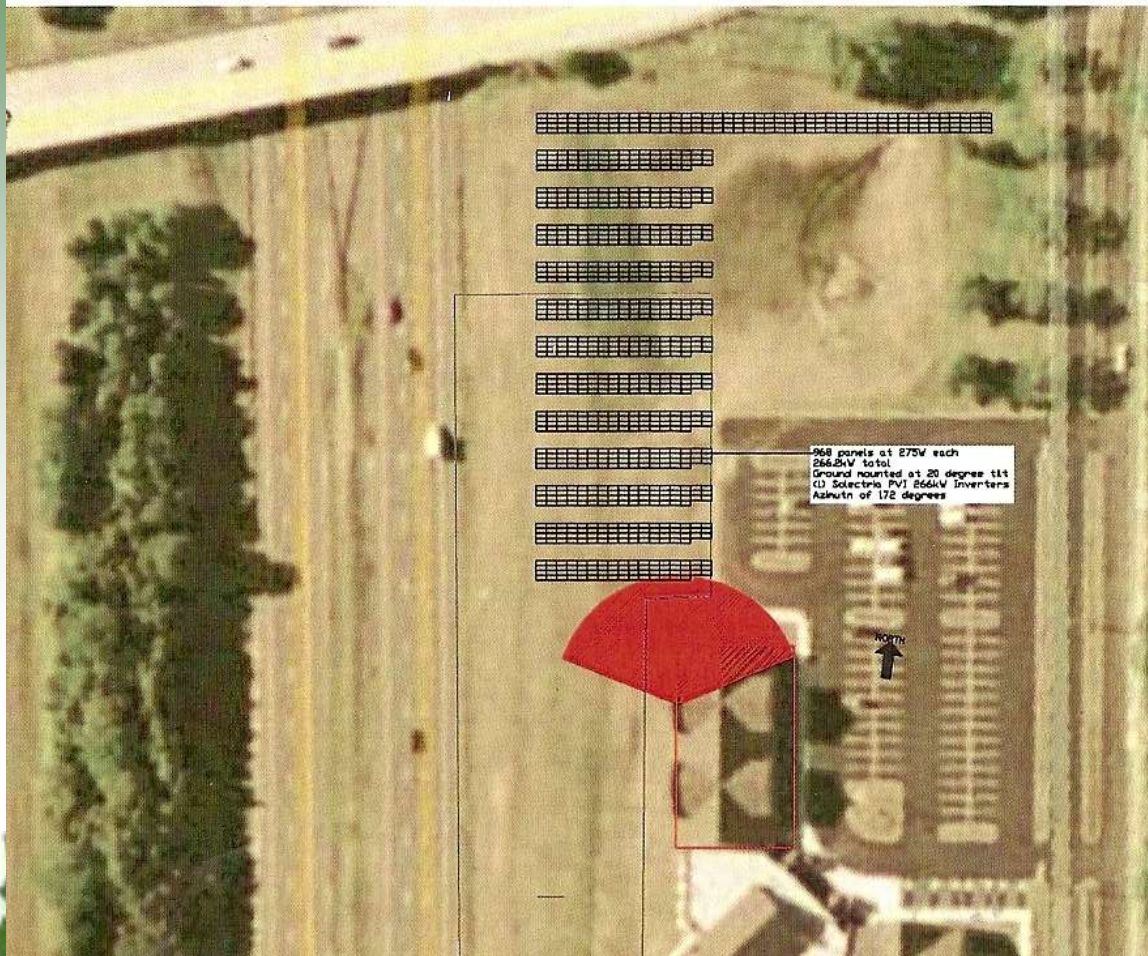


Cumulative Budget Impact

<u>Year</u>	<u>7 Year Lease</u>	<u>10 Year Lease</u>	<u>Purchase</u>	<u>PPA</u>
1	\$ 37,560	\$ 180,560	\$ 225,468	\$ 19,008
2	\$ 111,643	\$ 397,643	\$ 437,459	\$ 38,491
3	\$ 172,248	\$ 601,248	\$ 635,972	\$ 58,450
4	\$ 219,377	\$ 791,377	\$ 821,008	\$ 78,883
5	\$ 253,028	\$ 968,028	\$ 992,568	\$ 99,792
6	\$ 273,202	\$ 1,131,202	\$ 1,150,649	\$ 121,176
7	\$ 279,899	\$ 1,280,899	\$ 1,295,254	\$ 143,035
8	\$ 102,118	\$ 1,417,118	\$ 1,426,382	\$ 165,370
9	\$ 675,861	\$ 1,539,861	\$ 1,544,032	\$ 188,179
10	\$ 1,236,126	\$ 1,649,126	\$ 1,648,205	\$ 211,464
11	\$ 1,782,914	\$ 1,685,914	\$ 1,738,901	\$ 235,224
12	\$ 2,316,225	\$ 2,219,225	\$ 1,816,120	\$ 259,459
13	\$ 2,836,058	\$ 2,739,058	\$ 1,879,861	\$ 284,170
14	\$ 3,342,415	\$ 3,245,415	\$ 1,930,126	\$ 309,355
15	\$ 3,835,294	\$ 3,738,294	\$ 1,966,913	\$ 335,016
16	\$ 4,009,534	\$ 3,912,534	\$ 2,141,153	\$ 361,152
17	\$ 4,186,942	\$ 4,089,942	\$ 2,318,561	\$ 387,763
18	\$ 4,367,518	\$ 4,270,518	\$ 2,499,137	\$ 414,850
19	\$ 4,551,262	\$ 4,454,262	\$ 2,682,881	\$ 442,411
20	\$ 4,738,174	\$ 4,641,174	\$ 2,869,793	\$ 470,448



Potential Panel Locations



Ground Mount Along Highway



Parking Lot Canopy



Next Steps

- ❖ Detailed Financial and Technical Analysis
- ❖ Bond Ordinance / Lease Preparation
- ❖ RFP Preparation
- ❖ Proposal Review
- ❖ Implementation



Thanks to the Technical Advisory Committee!

- ❑ **Bob Fasulo**
- ❑ **Rob Mauro**
- ❑ **Richard Jesmajian**
- ❑ **Steve Giamos**
- ❑ **T.J. Totland**
- ❑ **Michael Barrett**
- ❑ **Andy Mayer**
- ❑ **Doreen D'Annunzio**



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