Town of Chebeague Island
Municipal Solar Project (Island Institute Presentation)

April 28, 2017
Presented by Christopher Loder
There are two motivations for this proposal. Each take the long view for the municipality and more importantly, the burdens and benefits that fall on the taxpayer.

Financial
- For a solar energy solution to be viable, it must demonstrate clear financial value for the taxpayers
- Electricity is a known expense which will continue for many years to come
- A great solution should minimize short-term impact and provide long-term benefit

Environmental
- As island residents, we are aware of the fragility of our shared ecosystem
- A Solar energy solution would reduce Chebeague’s CO₂ footprint by over 40 tons of emissions annually

Municipal Leadership (bonus round)
- Chebeague will contribute its voice with other municipalities in Maine who are making similar commitments to fiscal and environmental responsibility
The municipality has a number of accounts which benefit from a combined solar generation installation.

Total consumption ranges between 75,000 and 85,000 KWh per year, including town offices, garage, stone wharf, chandlers wharf, and the school (which accounts for approx. 33,000KWh of the total).

$12,000 per year

Solar array sizing is based on solar irradiance, latitude, shading, # hrs per day etc. The rough calculation for the town’s needs are $75MWh/yr \div 1240h/yr = 60.4$ KW
What is Net Metering?

Net Metering a system in which renewable energy generators are connected to a public-utility power grid. The surplus power is transferred onto the grid, allowing customers to offset the cost of power drawn from the utility.

It is a energy and financial accounting agreement, allowing for excess generation to be credited to over consumption during an agreed upon time period.

For a 12 month time period Chebeague would consume and generate ~75,000KWh/year with month-to-month variances being negated by the whole-year view.
Possible Locations

1. Ball Field
2. Ye Olde Landfill
3. Public Works Garage
# Solution Options

<table>
<thead>
<tr>
<th>Do-It-Yourself</th>
<th>Buy a Turn-key Solution</th>
<th>Power Purchase Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Find Project Manager</td>
<td>• Turn Key</td>
<td>• Turn Key</td>
</tr>
<tr>
<td>• Purchase Components</td>
<td>• Choose Vendor</td>
<td>• Choose Vendor</td>
</tr>
<tr>
<td>• Hire Contractors</td>
<td>• Fund – Bond/Taxes</td>
<td>• Choose payment plan</td>
</tr>
<tr>
<td>• Fund – Bond/Taxes or</td>
<td>• Fund – Private parties</td>
<td>• Best ROI of three choices</td>
</tr>
<tr>
<td>• Fund – Private parties</td>
<td>• Fund – Private parties</td>
<td>•</td>
</tr>
<tr>
<td>• Assemble Components</td>
<td>• Pull the switch !</td>
<td>• Pull the switch !</td>
</tr>
<tr>
<td>• Complete Contracts</td>
<td>• Pull the switch !</td>
<td>• Pull the switch !</td>
</tr>
</tbody>
</table>

- **Pull the switch!**
Cumulative Cost / Benefit

PPA 7-Year Buyout Cash
PPA 7-year Buyout Loan
Purchase Bonded @3%, 12y
No Action (flat rates)
No Action (inflation)

Spreadsheet tables provided by Revision Energy
Recipe

Idea

Build Core Supporter Team

Current Usage & Sizing (get the facts)

Scout Locations

Prepare Presentation

“Do the math” and Value Proposition

Interview Vendors

Draft Requirements

Meet with individual board / council members

Present to Board (with Vendor)

Addition Public Meetings

Prepare for Town Meeting, Site Prep, Permits, build...

Socialize with supporters and potential detractors

Turn it on!

Public View of Power Generated & Taxpayer Savings
Backup Content
A power purchase agreement (PPA), or electricity power agreement, is a contract between two parties, one which generates electricity (the seller) and one which is looking to purchase electricity (the buyer).

**Electricity Flow**
- Generation
- Excess Generation
- Consumption

**Financial View**
- Power Purchase Agreement (Per KWh Rate)
- Net Metering Agreement
- Per KWh Rate – Credit / Tariff (if Town consumes more than it generates)
- Account Fees
Your Tax Bill: Spending and Saving

We would spend >$600,000 over 40 years

We could spend ~$200,000 over 40 years, saving ~$400,000
Next Steps

**Board / Town Actions**
- Participate in site review, including TA, Bos, PW, Code Officer, Planning Board
- Determine additional site prep / environmental impact
- Verify Usage and potential savings
- Review proposed contracts
- Execute Legal Review
- Prepare Warrant for Town Meeting (as appropriate)

**ReVision / Project Actions**
- Participate in Site Review
- Determine Additional Site prep
- Verify Sizing / Final Proposal
- Establish project timeline
- Prepare additional contracts
- Provide References

Hold additional public meeting for project review, public awareness, Q&A
Site Visit

SYSTEM SUMMARY:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DETAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC SYSTEM SIZE:</td>
<td>63.0 kWdc</td>
</tr>
<tr>
<td>AC SYSTEM SIZE:</td>
<td>46.2 kWac</td>
</tr>
<tr>
<td>PV MODULE:</td>
<td>(180) 350W REC350TPS 72 XV</td>
</tr>
<tr>
<td>INVERTERS:</td>
<td>(6) SMA SB7.7-ISP-US-4.0</td>
</tr>
<tr>
<td>TILT &amp; AZIMUTH:</td>
<td>35° TILT; 180° AZIMUTH</td>
</tr>
<tr>
<td>SYSTEM TYPE:</td>
<td>GROUND MOUNT, DRIVEN PILE</td>
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</tbody>
</table>

NOTES:
1) AVOID DRAINAGE TO NORTH, EAST, AND WEST OF ARRAY LOCATION.
2) TOWN SCOPE - SITE GRADING, UTILITY SERVICE UPGRADES
3) UPGRADE UTILITY TRANSFORMER TO 50kVA
4) UPGRADE MAIN SERVICE PANEL TO 400A
5) AC CONNECTION - OVERHEAD TO PUBLIC WORKS OR TRENCH

25 KVA UTILITY XFMR, POLE-MOUNT

PV ARRAY, SITE GRADING REQUIRED

PUBLIC WORKS BLDG.

LOCATION OF INTERCONNECTION POINT, MAIN SERVICE PANEL, UTILITY METER