

The Economic Justification for Why H.396 Serves the Public Interest

Why a privately or publicly financed Solar Array project
retaining its *Renewable Energy Credits* (RECs)
can offer superior societal benefits over
Investor Owned Utility Solar Arrays

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Overview: We Will Examine Four Solar PV Array Business Models

- Privately financed farm business and residential solar system
 - Model based on existing Solar Haven Farm LLC installation
- Privately financed community solar cooperative LLC
 - Model developed with help from ACORN Solar
- Public bond financed municipal solar project
 - Community net-meter solar on town land, power purchase agreement per household pays off bond (PACE loan)
- Investor Owned Utility (IOU)
 - Modeled on the GMP Panton 5MW solar array
 - Unlike other models, shareholders receive 9% ROE over life of project

Solar Haven Farm LLC

Net-meter solar expansion project

- \$14,500 initial capital expenditure before Federal tax credit, \$2.41 per peak Watt after tax credits
- Barn roof-mounted 4,200 peak DC watts, installed October 2016
- Prior two solar arrays have been operational since 2009 and 2012
- Solar Haven Farm LLC retains all of its Renewable Energy Credits
 - Have the option of adding “powered by renewable energy” on marketing collateral
 - Solar adder of \$0.053/kw-h makes the business model return on investment a “go”
- Off-grid solar powered irrigation system independent of grid-tied system
- Total 8,300 watt solar system supports co-located loads:
 - Berry farm freezers and market produce walk-in “cool room”
 - Volt Plug-in Hybrid Electric Vehicle: 2,800 kw-h per year (10,500 miles)
 - Commercial kitchen, coming online 3Q'2017
 - Heat pump air conditioning/heating in residence and commercial kitchen
 - Battery backup provides fault-tolerance for critical loads (freezers)
- Net-zero energy farm operation on an annual basis

Community Solar Cooperative LLC

- Modeled on the ACORN net-metered solar project in Shoreham
 - Financial data approximated, because the approval of the project’s public security offering disclosure is still pending
 - 150KW net-meter project currently before PSB for CPG approval
- Anchor “class A” shareholder acquires the Federal ITC and accelerated depreciation tax benefits
- *Vermont Small Business Offer Exemption (VSBOE)* to the “Class B” shareholders, an intra-state security offering
 - Shareholder receive a discounted price per solar panel share (pass-thru of partial ITC benefit from anchor investor)
 - Option for shareholders to buy solar panel assets at year seven of project
- ACORN will surrender its RECs to the Utility because the project is not financially attractive to investors if its net-meter credit is reduced by \$0.06 per KW-h
 - There is a \$0.03/KW-h penalty for retaining RECs, \$0.03/KW-h adder for giving them to GMP
 - ACORN is no longer able to claim in its marketing it is building a renewable energy project and Co-op members may mistakenly advertise they are participating in a renewable energy project

Public Investment Municipal Solar Cooperative Project

- Derived from the privately financed community solar project business model demonstrated by the ACORN solar project
 - Concept being investigated by Planning Commission for an Act 174 compliant energy plan in Shoreham
- Substitutes a public bond issued in place of the private VSBOE security offering. Like ACORN, requires an anchor investor with tax appetite.
 - Requires a town vote to authorize the bond and the *Property Assessed Clean Energy (PACE)* framework
 - PACE loan enables participation by citizens who could not otherwise assemble the initial capital
- The bond underwrites a PACE loan for each participating household
 - Structured as a Power Purchase Agreement scaled by number of solar panels purchased by the loan
- Each household receives a monthly solar PV net-meter credit for its solar panel shares
- The bond is repaid by a PACE loan micro-payment per KW-h consumed by the household
 - The difference between the annual net-meter credits and the loan payments is a reduction in the home owner's utility bill.
 - PACE loan obligation continues across changes in the household's property ownership
- Town's municipal government can participate, provided the town votes to authorize a power purchase agreement repaid by all citizens on their municipal property tax
- Solar PV project must retain its RECs to substantiate its claim of compliance to the town plan's renewable energy goals as required by Act 174
- By virtue of its municipal membership, the solar cooperative inherently locates the solar array close to the associated electrical loads and minimizes the transmission losses

Investor Owned Utility Solar Array Project

- Large-scale, yields economies of scale
 - Example: GMP solar project in Panton, 40 acre site, 4.9 AC Megawatt solar project, \$2.093 per peak DC watt = (\$12.3M initial capital) / (5.875 peak DC Megawatts)
 - Supporting facts found in PSB docket 8637 filings and final order
- Huge benefits to Gaz Metro shareholders for each \$1M invested:
 - \$300,000 Federal Investment Tax Credit in first year
 - \$1,000,000 accelerated depreciation tax deductions over five years (MACRS GDS 5 year property schedule, Pub 946 Table A-5)
 - Annual retail electric income of \$109,791
 - $739,837 \text{ kw-h generated per } \$1\text{M invested} = (9,100 \text{ AC MW-h generated by project per year}) / (\$12.3\text{M initial capital}), \text{ rate } 1 @ \$0.1484/\text{kw-h}$
 - Contributes 739.8 RECs per year towards the GMP Renewable Portfolio Standard quota
 - Return on Equity annual payments of 9.5% on the solar array's \$12.3M "rate base" over the 25 year life of the project, rewarding Gaz Metro shareholders with \$1.168M in first year
 - Thereafter, the annual ROE amount diminishes in unison with the asset's depreciated value.
 - ROE revenue forecast predicated on GMP rate case moving all of the initial capital into the rate base
- Comprehensive Energy Plan calls for a build out of 1,500 to 2,250 AC Megawatts of solar power generation over next two decades
 - Implies Vermont's potential solar PV array rate base value will expand to \$3.1B to \$4.7B

Rule 5.100 REC Retention Penalty Has an Adverse Impact on the ROI Period for all Non-utility Solar Project Business Models

Solar Project's CPG application date	Net-Meter REC Retention Policy	Solar Haven Farm Business Model ROI Period	ACORN Solar Cooperative Business Model ROI Period	Public Investment Municipal Solar Business Model ROI Period
Before 1/1/2017	No REC retention penalty, plus "solar adder"	9 years \$0.053/kw-h solar adder	8 years \$0.049/kw-h solar adder	N years \$0.049/kw-h solar adder
After 1/1/2017	REC retention penalty, No REC payment	14 years Negative \$0.03/kw-h	13 years Negative \$0.03/kw-h	N+5 years Negative \$0.03/kw-h
After H.396 enacted	No REC penalty, no solar adder	12 years No adjusters	10 years No adjusters	N+2 years No adjusters
After H.396 enacted	No REC penalty, plus solar adder	11 years \$0.03/kw-h	8 years \$0.03/kw-h	N years \$0.03/kw-h

Federal Trade Commission Has Jurisdiction over Enforcing Fair REC Interstate Markets

- States have exclusive jurisdiction to set retail electric rates
- However, RECs are an interstate commodity outside of the State's PSB jurisdiction, and therefore:
 - Bundling the REC price and its penalty in net-meter Rule 5.100 may be considered an unlawful restraint on interstate competition between REC markets because it fixes a consumer's REC price in a public tariff and locks it in for the life of the solar project into one REC market
 - U.S.C Title 15 § 45(n) Unfair methods of competition unlawful: "*the act or practice causes or is likely to cause substantial injury to consumers...*"
 - Businesses who chose to be in the "Voluntary REC market" by retiring their RECs will be penalized at \$0.06/kw-h, whereas the monopoly Utility solar array incurs no economic penalty for retiring their REC generation
 - The longer ROI period incurred by the Utility's consumers who chose REC retention is substantial economic injury
- Rule 5.100 as currently written arguably favors the Utility's *Renewable Portfolio Standard (RPS)* interests over the option of retiring the RECs so that a business can truthfully make environmental claims when marketing its products or services.
 - FTC may take enforcement action against a business if it has surrendered its REC ownership to the Utility yet the business claims it is generating renewable energy
 - See 16 C.F.R § 260.15 and also the FTC "Green Guides"

Why H.396 Should Be Enacted

- H.396 decreases the Return on Investment period for net-metered solar projects back towards where it was before 1/1/2017
 - Privately funded solar projects will be employing solar developer firms (6% of Vermont's workforce)
- H.396 also mitigates the potential FTC REC market problem by removing the PSB bias favoring the Utility
 - The consumer can annually choose without penalty to either liquidate their RECs at an out of state market, retire their RECs at a National REC certification service, or else self-certify they have retired their RECs themselves
- The long-term solution may be a transparent, open, and liquid Vermont REC auction market with REC life cycle audit trail