

WIND TURBINE ALTERNATIVES REPORT

Prepared for August 12, 2013 Meeting of the Board of Selectmen

General Overview

This briefing attempts to document from existing resources, the town-wide impacts and/or benefits as well as neighborhood impacts/benefits associated with the options outlined in the Wind Turbine Options Report as well as other limited alternatives. This briefing also attempts to include key thresholds required to implement each of the options to assist the Board in making a long term decision about wind turbine operations for implementation early in the last quarter of this calendar year. This staff document has been prepared in furtherance of the directive of the Board of Selectmen at their Workshop Meeting of July 1, 2013. It is developed with respect for the fiduciary responsibility of the Board in moving forward operationally with the Town-owned wind turbines, given the clear determination of the public in the recent municipal election declining to support by a decisive margin the necessary action to cease operation of these turbines.

In analyzing information related to noise complaints, the data indicates that distance matters. Three (3) of five (5) homes within ¼ mile of Wind 1 logged complaints (60%) and five (5) of eleven (11) homes within ¼ mile of Wind II logged complaints (45%). In the area from the quarter mile to the third of a mile distance, six (6) of twenty-one (21) homes between ¼ mile and 1/3 mile of Wind 1 logged complaints (29%) and eleven (11) of forty-one (41) homes between ¼ and 1/3 mile of Wind II logged complaints (17%). Noise complaints clearly diminish significantly with distance.

Given the legal challenges, Town Counsel has advised that any responsible resolution must include a mitigation component to respect the concerns of neighbors and those in the community who support them. The Town of Falmouth has one measured sound exceedance located at 211 Blacksmith Shop Road as reported in the Massachusetts Department of Environmental Protection, (MassDEP) May 2012 sound monitoring report voluntarily requested by the Town. The WTOP found the most promising noise mitigations option(s) to be interior sound insulation with a likely 3-9 dBa reduction in sound and sound masking to reduce amplitude modulation (see page 11 WTOP). Further, MassDEP has recognized the voluntary sale of a property and/or execution of an acoustic easement at an impacted location as viable mitigation tools that have been used in other cases where sound exceedances were found.

Fiscal Overview

Current Fiscal Commitment(s)

Wind 1 Debt. The amount of \$417,169 is payable in Fiscal year 2015, this payment declines over the next 15 years with the final payment of \$294,375 due in 2029.

Wind 2 obligations. The Town authorized \$4,865,000 in 0% interest State Revolving Fund Loans to be forgiven upon compliance with the terms of the contract. According to the latest letter received from the Commonwealth, indicates that changes in operations may have to be reviewed by the State in order to keep the loan forgiveness in-tact.

Annual Operating Expenses. Direct energy expenses are approximately \$120,000/year depending on rates and wastewater treatment plant consumption, plus \$106,221 for the Renewable Energy Budget, which declines to \$0 as service contracts expire.

Mass CEC/REC Contract. In 2010 the Town received \$1,010,623 advanced payment for 48,924 Renewable Energy Certificates. The Town has repaid \$11,790 in advance payments because commercial operation was delayed by 90 days reducing the value to \$998,833. The Town has guaranteed delivery of 3,262 REC's to the MassCEC annually from 2015-2029. The estimated stipulated refund value is \$2,054,808 (\$42/REC). The Town is in the process of negotiating relief as long as the turbines are operating.

Future Fiscal Commitment(s)

In July of 2010 special legislation was enacted to allow the Town of Falmouth to separate revenues generated from the operation of wind energy facilities and other renewable energy producing facilities. The receipts may be appropriated to pay the cost of operation and maintenance of wind and other renewable energy facilities, future improvements and repairs, other energy related expenses and principal and interest on any bonds or notes issued. The balance as of June 30, 2013 is \$350,115.

The Town has depleted most of the wind turbine reserves, originally totaling approximately \$1 million. The Wind Turbine Reserve Account was established to ensure that the taxpayers were not adversely impacted by fluctuations in wind energy as well as normal operations and maintenance costs. The revenue generated annually by the Board of Selectmen's temporary ("12 hours on") operating plan, established to bring neighborhood stakeholders to the WTOP process, supports only the yearly debt service which, after depleting reserves, results in a continued deficit of approximately \$100,000 per year. In addition, there is no provision for monies to be set aside to offset routine maintenance, unforeseen capital costs and other events in which the turbines may stop operating. The continuation of this plan puts the Town at considerable financial risk.

According to SEA consulting, electricity markets are inherently volatile. This anticipated volatility affects the market value of net metering credits, excess electricity sold at wholesale, and RECs over time. This analysis relies on the most recently available data to estimate future net metering credits and REC values. Deviations from individual forecasts should be expected as market conditions change, and it is therefore appropriate to consider a range of potential outcomes to make an informed decision.

Options from WTOP Report

(1) Full Operation

Assumptions: Renewable Energy Certificates owed to MassCEC will be forgiven; REC's remaining will be resold at \$25/MWh. This option will meet the ARRA/SRF Loan Terms and therefore Bonds Granted for Wind II will not be paid back. \$1million Reserve fund is replenished, \$200,000 a year for 5 years.

Understanding of Full Operation

- Advocates voluntary sale of residences within a certain distance or based upon an alternative standard
- Homes purchased would be resold
- Suggests consideration of some type of financial compensation to residents living within a certain distance for reductions in "quality of life"
- Advocates involvement of a neutral, third party to implement mitigation process

Actions Required

- Identify Funding Sources – Operations Budget, Additional Aid, Town Funds
- Designate a Neutral
- Town Meeting Action for funding and to authorize real estate transactions.
- Swift Implementation by Neutral in collaboration with Legal Team

Impacts/Benefits

- 100% Production – 7,513 MWh
- Funding source for mitigation available
- Some neighboring owners have expressed an interest in selling their homes if operations of wind turbines continue 24/7.
- DEP Regulatory Compliance met if mitigation is implemented
- Homeowners may be unwilling to sell or provide release; continues commitment to renewable energy; has the potential to support planned increased energy demand resulting from WWTF expansion
- Balanced Operating Budget
- Adaptive Management Practices could be considered in the future

Full Operation 24/7

Revenue

Generated by the Full Operation of Wind 1 and 2	\$ 1,020,936
REC Revenue	73,077

<i>Total Revenue</i>	\$ 1,094,013
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Expenses

Wind 1 and Wind 2 operation and Maintenance Costs	122,389
Electrical equipment inspection and Maintenance	11,314
Insurance	7,007
Comcast cable, Verizon phone and power dash	10,156
Total Debt Service	417,169
Transferred to Reserve Account	209,091
Cost of electricity provided to WWTF	96,771

<i>Total Expenses</i>	\$ 873,897
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<i>Net Revenue</i>	\$ 220,116
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Please note that these figures are estimates and originate from the estimated financials from SEA consultants

2)Break-Even Curtailment

Assumptions: Renewable Energy Certificates owed to MassCEC will be forgiven; REC's remaining will be resold at \$25/MWh. This option will meet the ARRA/SRF Loan Terms and Bonds Granted for Wind II will not have to be paid back. \$1million Reserve fund is replenished, \$200,000 a year for 5 years .

Understanding of Break-Even Curtailment (see pg. 2 WTOP Report)

- Advocates attempting to “balance” curtailment operating hours such that revenues produced equals projected costs of operation, including capital.
- Rejected notion of curtailment based upon wind speeds, given that revenues are generally related to higher wind speeds.
- WTOP Scenario one: turbines operate to generate sufficient revenue to rebuild a \$1 million reserve fund and cover the cost of electricity at WWTF.
- WTOP Scenario two: turbines operate to meet operating costs and cover the cost of electricity at WWTF but a reserve fund is not re-established and not recommended.

Necessary Actions – Vote of the Board of Selectmen; Town Meeting to address continuing annual deficit, Seek Additional Assistance.

Impacts/Benefits

- Resolves single DEP exceedance by curtailing operation of wind 1 at “night”
- WTOP study shows Break Even plan in deficit in both scenarios from 2015-2021 even with REC's forgiven and resold.
- FY 2015 – Net Cash Flow – **(\$103,333)**
- Financial Plan has considerable uncertainty which could place significant future burden on taxpayer
- Lower production = Increased financial Risk
- Continues commitment to renewable energy by providing source for current WWTF
- Does not support future WWTF energy demand
- Estimated 68% Production – 5,078/7,513 MWh
- Fiscal benefit is limited to the operation of the Wastewater Treatment Plant
- Limited funds available for mitigation available in 2019

Break Even Curtailment

Revenue	
Generated by the Full Operation of Wind 1 and 2	\$ 697,487
REC Revenue	73,077
Total Revenue	\$ 770,564
Expenses	
Wind 1 and Wind 2 operation and Maintenance Costs	122,389
Electrical equipment inspection and Maintenance	11,314
Insurance	7,007
Comcast cable, verizon phone and power dash	10,156
Total Debt Service	417,169
Transferred to Reserve Account	209,091
Cost of electricity provided to WWTF	96,771
Total Expenses	\$ 873,897
Net Revenue	\$ (103,333)

Please note that these figures are estimates and originate from the estimated financials from SEA consultants

(3)12-Hour Curtailment

Assumptions: Renewable Energy Certificates owed to MassCEC will be forgiven; REC's remaining will be resold at \$25/MWh. This option will meet the ARRA/SRF Loan Terms and Bonds Granted for Wind II will not be paid back. \$1million Reserve fund is replenished, \$200,000 a year for 5 years .

Understanding of 12 Hour Curtailment

- Advocates curtailment from 7PM to 7AM, as well as during additional "early morning hours" to curtail shadow flicker.
- Will result in net operating and capital deficit and will require further continuing taxpayer subsidy from another source.
- Current, temporary Operating Protocol

Necessary Actions – Vote of the Board of Selectmen; Town Meeting to address continuing annual deficit; Seek additional funding sources

Impacts/Benefits- Resolves DEP exceedance of Wind 1 by curtailing operations of turbines at "night" Results in estimated five year loss of \$1.3million (WTOP pg. 28)

- Creates structural Annual Operating Budget Deficit which is ongoing
- Continues commitment to renewable energy by providing source for current WWTF
- Est. 51% of Possible Production – 3,823 MWh/7,513MWh
- FY2015 Net Revenue – **(\$274,126)**
- Lower production = Increased financial Risk
- Financial Plan has extreme uncertainty which would place large, ongoing future burden on taxpayer
- Offset Energy Demand for Current Operations of the Wastewater Treatment Plant
- No funding available for mitigation
- Adaptive Management Strategies such as more sophisticated operating controls in addition to or in place of time of day controls and serrated edges could be implemented in the future at an additional cost if such became available

12 Hour Operation

Revenue

Generated by the Full Operation of Wind 1 and 2	\$ 526,694
REC Revenue	73,077

Total Revenue	\$ 599,771
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Expenses

Wind 1 and Wind 2 operation and Maintenance Costs	122,389
Electrical equipment inspection and Maintenance	11,314
Insurance	7,007
Comcast cable, verizon phone and power dash	10,156
Total Debt Service	417,169
Transferred to Reserve Account	209,091
Cost of electricity provided to WWTF	96,771

Total Expenses	\$ 873,897
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Net Revenue	\$ (274,126)
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Please note that these figures are estimates and originate from the estimated financials from SEA consultants

(4) Remove Turbines and Restore the Site

Assumptions: Renewable Energy Certificates owed to MassCEC will not be forgiven and will be repaid. This option does not meet the operational requirements of the ARRA/SRF Loan Terms and therefore Bonds Granted for Wind II will be incurred.

Understanding of Full Operation

- Advocates removal and dismantling of turbines
- The Town failed to authorize funding at the ballot

Actions Required

- Identify Funding Sources – Operations Budget, Additional Aid, Town Funds

Impacts/Benefits

- Budgetary Deficit – FY2015 **(\$1,052,477)** (Please see page 3 of 4 of Town Meeting Presentation)
- Loss of Potential Energy Production – 7,513 MWh
- DEP Regulatory Compliance met if implemented
- Does not likely find 'amicable' end to conflicts – no resolution to litigation

Presented to the Board of Selectmen – March 11, 2013

Estimated Project Costs

A. Debt Wind I	\$5,717,862	-	\$5,717,862¹
B. Debt Wind II	\$4,865,000	-	\$5,886,650²
C. Shut Down, Remove and Restore	\$1,548,833	-	\$3,404,808
³ Direct Expenses	\$ 400,000	-	\$1,000,000
³ REC Contract	\$ 998,833	-	\$2,054,808
³ Legal, Consulting, Other	\$ 150,000	-	\$ 350,000
³ Liability/Exposure NIC			
D. ⁴ Service Contracts/Operating	\$ 120,000	-	\$ 226,221
Range	\$12,251,695	-	\$15,235,541

¹Outstanding Debt Including Interest

² Outstanding 0% Loan Value. If due will be repaid with 2% interest over 20 years.

³ Included/NIC in Line C Above.

⁴Annual Expenses

(5) Possible Replacement with Solar Array

Should be viable as a stand-alone project and considered on its own merits at some future point.

- Advocates combination of two otherwise distinct components – removal and sale of wind turbines and development of photovoltaic array.
- Town responsible for continuing capital/borrowing costs of wind 1 and wind 2.
- Would incur additional capital cost for development/placement of solar array.
- Solar array would not substitute fully for lost energy generation of wind turbines.

Not an alternative.

Other Alternatives Rejected By WTOP

- Relocation of one or both turbines – rejected due to variations in wind conditions at alternative locations, relative lack of very large and available land tracts with assurance of no potential neighborhood impact, and considerable delay and legal and logistical complexity in implementing such a relocation, among other reasons.

Further, subsequent to the issuance of the WTOP Final Report - the recent passage of a new wind turbine bylaw by Town Meeting in the spring of 2013 effectively now prevents the relocation of the existing Town wind turbines to a different location on the wastewater site or to another location within Falmouth.

- After-market changes to existing turbines – rejected due to absence of any such adaptive tools/machinery by manufacturer, also potential voiding of warranty, etc.

Other Alternative(s) for Consideration

Intermediate “Hybrid” Operation Alternative

Assumptions: Renewable Energy Certificate Repayment forgiven and SRF Loan Terms honored forgiving loan for Wind II; \$1million Reserve fund is replenished, \$200,000 a year for 5 years .

Hybrid Compromise Options

- Consider “hybrid” option between full and partial operation (between full operation and 12/12 operation).
- At least 80% production needed if we are to responsibly consider mitigation
- Would involve further analysis of operating/financial characteristics.
- By addressing many concerns increases likelihood of success
- Involvement of a neutral, third party to implement mitigation process.
- Limited by simple, single Time of Day control only; no other curtailments.

Actions Required

- Identify Funding Sources – Operations Budget, Additional Aid, Town Funds
- Designate a Neutral
- Town Meeting Action is required to authorize an interest in real property, only after agreement but prior to transaction
- Swift Implementation by Neutral in collaboration and Legal Team

Impacts/Benefits

- WTOP Study finds that curtailment would change homeowners decision about whether or not to sell their homes (WTOP pg. 28)
- Some neighboring owners have expressed an interest in selling their homes if operations of wind turbines continue 24/7.
- Could eliminate regulatory necessity to purchase homes or implement mitigation
- DEP Regulatory Compliance met if implemented
- Homeowners may be unwilling to sell or provide release
- Continues commitment to renewable energy
- Adaptive Management Strategies could be considered in the future

Examples of Operating Scenarios:

1. Seasonal Adjustment - No production either turbine June, July, August -projected Annual Deficit of **(-\$130,000)**.
2. Wind I and II – Optimized 16 Hour Operation Both Turbines
68% Production -5,144 MWh
Net Cash Flow 2015 – **(-\$90,000)**
3. Wind I 16 Hour Operation/Wind II – 20 Hour Operation
76% Production – 5,676 MWh
Net Cash Flow 2015- **(-\$7,000)**
4. Wind I 12 Hour Operation/Wind II 24 Hour Operation
____Production
Net cash Flow 2015 – (awaiting data)
5. Wind I and II – 20 Hour Operation
84% Production - 6,306 MWh
Net Cash Flow 2015 - \$60,000
6. Wind I - 16 Hour and Wind II – 24h
84% Production -6,284 MWh
Net Cash Flow 2015 - \$90,000
7. Wind 1 20 Hour Operation and Wind II 24 Hour Operation
91% Production – 6,834 MWh
Net Cash Flow 2015- \$160,000

Assumptions; Reserve Fund is replenished \$1,000,000 in total contribution; The obligation to deliver Wind I REC's has been forgiven; All REC's from WIND I are assumed to be resold at \$25.00/REC. SRF/AARA Obligations are met, no repayment on WIND II Bond.

Requested for Review

At the July 1, 2013 Meeting of the Board

- More Detail on Resale: Cost Range - \$400,000-\$1,000,000 – The removal of a wind turbine will require similar logistical, technical, and construction oversight as the installation of a new wind turbine. The estimated cost to procure, permit, dismantle and remove both turbines and restore the site is approximately \$1,000,000. A December 2011 report by Weston and Sampson, Inc., estimates \$838,000 in direct expenses. The range includes a 20% escalation for bidding, contract and construction management, and services as may be required, and project contingency. The same report estimated \$100,000-\$600,000 in potential resale value, if any. This was tested informally in the marketplace through the WTOP process and accepted by that group as substantiated. The actual cost/value will not be known until a turbine is legitimately made available in the market place, speculation will only further cloud the real cost/value. – See MassCEC report in in WTOP Appendix. Further, additional funds appropriated for this purpose were contingent upon an affirmative result at May 2013 general election to take the turbines down.
- Additional Consideration of relocation on site or to a private parcel. Relocation costs onsite are similar to an offsite relocation \$4.4 million. See Weston and Sampson, Inc., Report. Also refer to update above due to Town Meeting new wind turbine bylaw, rendering this impractical to reasonably consider.
- WTOP Has studied and rejected sites in Falmouth, pg. 16 WTOP, Falmouth GIS and MassCEC have studied and concluded that there no viable sites in Falmouth. (see MassCEC report WTOP Appendix)
- Private locations –also not viable or available
- Limitations include, elevation (100+ difference in elevation, limited wind resource, property restrictions, local zoning bylaw, FAA Waivers, restrictions, other) as well as Town Meeting new wind turbine bylaw.
- All Bonds for this project are considered General Obligation Bonds
- Estimated Financials for Wind Turbine Operating Scenarios provided on separate exhibit

Staff Process Recommendations

- BOS act to designate a preferred alternative(s)
- BOS Request that staff further detail and articulate this in all its options/nuances
- As per Town Counsel, responsible resolution must include a mitigation component
- If preferred alternative includes production exceeding 80%, staff will suggest a package of mitigation options – as wind turbine revenue will support exploring mitigation
- BOS Affirm an anticipated timetable for implementation; suggest final operational decision in September with implementation beginning in October 2013.
- Board Vote to affirm process on August 12, 2013