The Town of Sandisfield
Energy Reduction Plan

In fulfillment of the
Massachusetts Green Communities Grant
Program Criterion 3

October 2018
TABLE OF CONTENTS

I. PURPOSE AND ACKNOWLEDGEMENTS .................................................................................................................. 2
II. EXECUTIVE SUMMARY ........................................................................................................................................... 2
III. ENERGY USE BASELINE INVENTORY ................................................................................................................... 5
IV. ENERGY REDUCTION PLAN .................................................................................................................................... 6
V. RENEWABLE ENERGY PROJECTS ....................................................................................................................... 11
VI. REFERENCES ......................................................................................................................................................... 12
VII. APPENDICES ........................................................................................................................................................ 12
I. PURPOSE AND ACKNOWLEDGEMENTS

   a. Town and School District Support

   The Sandisfield Board of Selectmen, acting as the CEO of the Town of Sandisfield, adopted this Energy Reduction Plan (ERP) for the Town of Sandisfield. Their letter of adoption is included in Appendix A.

   b. List of Contributors

   The key town staff who provided information and guidance throughout the development of this plan are as follows:
   - Anina Carr, Green Communities Team
   - Larry Dwyer, Green Communities Team
   - Mark Newman, Select Board Chairman, Interim Highway Superintendent, Green Team
   - George Riley, Select Board, Green Communities Team
   - Fred Ventresco, Town Administrator

   Staff from Energy Resources in Thomaston, CT conducted energy audits of the Town’s buildings in the autumn of 2018. The results of these audits provided the information that allowed Town staff to develop a five-year energy reduction plan. Lauren Gaherty of the Berkshire Regional Planning Commission provided technical assistance to the Town, gathered fuel data, creating accounts in the MassEnergyInsight (MEI) platform, an aided the Town in drafting this report.

II. EXECUTIVE SUMMARY

   a. Narrative Summary of the Town

   The Town of Sandisfield is a rural community located in southern Berkshire County, Massachusetts. Sandisfield is a hidden gem of the southern Berkshire region, known for its impressive natural and cultural resources and community of both year-round residents and second homeowners who enjoy the quiet and solitude life the Town provides. The year-round population of the Town is approximately 900, which is the fourth least densely developed town in Berkshire County. Sandisfield is approximately 53 square miles in size. Approximately 98% of the Town is undeveloped, with forest covering 90% of the total land cover. Other undeveloped land uses include open water, wetlands and fields.

   Two major regional roadways serve Sandisfield: Route 57 and Route 8. Route 8 runs north/south through the Town while Route 57 is the major east-west route. Route 57, while a numbered state route, is the maintenance responsibility of the town. The Town owns and maintains 81 miles of roadway, including Route 57, while MassDOT owns and maintains approximately 11 miles of roads, including Route 8.

   Sandisfield residents have recently voiced their desire to promote and utilize clean energy technologies across the Town. During the development of the Town’s Master Plan in 2016, 83% respondents to a town-side survey were in favor of potential energy efficiency upgrades to Town buildings. Additionally, one of the Goals that emerged from Sandisfield Master Plan was to Develop Alternative Sources of

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1 Adapted from Master Plan Town of Sandisfield, Massachusetts (Sandisfield Master Plan Steering Committee & BRPC, 2016).
Energy in Sandisfield, including the two objectives of 1) amending town bylaws to promote alternative energy development and 2) promoting energy efficiency and small-scale energy production by residents. The pursuit of Green Communities designation and the implementation of energy reduction measures in Town buildings follows through on these voiced desires.

b. Summary of Municipal Energy Uses

The Town of Sandisfield currently owns six facilities: the Old Town Hall, Town Hall Annex, Highway Garage, Library, Transfer Station and Yanner Park. The Highway Garage was destroyed by fire in December 2017, where damages included the total loss of the building, four plow trucks and other equipment. The reconstruction of the garage was under construction in October 2018 when this plan was drafted, and is expected to be completed and occupied in January/February 2019. The current vehicle fleet maintained by the DPW is a mix of equipment donated by other communities and new vehicles purchased by the Town after the fire.

The Town Annex serves as the Administrative Offices building for the Town, housing all administrative staff. It is a 5,400-square-foot brick building, constructed in 1950 to serve as the Town’s school. The building is occupied approximately 40 or more hours per week. The interior has not been altered significantly since its use as a school. The main floor houses the administrative offices occupy the main floor and the basement is used for social gatherings, used primarily by the Council on Aging for lunches.

The Old Town Hall, built in 1945, serves as the public meeting place for municipal board meetings. It is a wooden building approximately 2,240 square feet in size. It is typically used 12-15 hours per week. The building also houses the police station office.

The new Highway Garage is being built on the same footprint as the old garage, next to the Old Town Hall and on the same parcel of land. The new building is being constructed to a building code that requires a higher energy efficiency standard than the old one, and is expected to use significantly less energy due to building insulation, more efficient heating and lighting systems, and insulated garage doors. The photo to the right shows the insulation being installed in the building.
The Sandisfield Library is a 1,740-square-foot wood building, constructed in 1977. It is heated with oil. It is open for public use approximately 13-15 hours per week.

The Sandisfield transfer station uses electricity for the compactor and for a space heater to heat a comfort station for the attendant. Yanner Park uses electricity for a streetlight at the site. There are a few streetlights in the Town.

The Sandisfield Fire Department that serves the Town does not own the two firehouse buildings used by the Department; these buildings are privately owned and rented through yearly lease agreements. The Town of Sandisfield pays for the utilities that serve the buildings. Because the Town does not own or have complete control of the buildings, the two firehouses are not included in the Town’s baseline inventory of fuel use.

There are no public water or sewer services provided in Sandisfield, with all water served by individual wells and all sewer served via private septic systems. The Town does not own or maintain any school buildings; the Town is a member of the Farmington River School District, with the school buildings located outside Sandisfield.

The Department of Public Works maintains majority of the Town’s vehicle fleet, with eight vehicles and five large pieces of equipment that burn gasoline and diesel. The Police Department maintains a fleet of two vehicles (one SUV and one pickup truck), both of which use gasoline. All except one town-owned vehicles are exempt, as defined by the Green Communities Criterion #4, either because they are heavier than the 8,500 gross vehicle weight or because they are used as first responder vehicles. The Fire Chief’s vehicle is the only vehicles that the Town considers administrative in nature. The Town does not own any school buses or vans in its fleet.

Table 1. Summary of Municipal Energy Users

<table>
<thead>
<tr>
<th>Facility</th>
<th>Location</th>
<th>Fuel Use</th>
<th>MMBtu FY 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town Hall Annex</td>
<td>66 Sandisfield Rd</td>
<td>Electricity, Oil</td>
<td>401</td>
</tr>
<tr>
<td>Old Town Hall</td>
<td>3 Silverbrook Rd</td>
<td>Electricity, Oil</td>
<td>290</td>
</tr>
<tr>
<td>Transfer Station</td>
<td>Sandisfield Rd</td>
<td>Electricity</td>
<td>5</td>
</tr>
<tr>
<td>Highway Garage</td>
<td>3 Silverbrook Rd</td>
<td>Electricity, Oil</td>
<td>283</td>
</tr>
<tr>
<td>Library</td>
<td>23 Sandisfield Rd</td>
<td>Electricity, Oil</td>
<td>92</td>
</tr>
<tr>
<td>Streetlights</td>
<td>Various locations</td>
<td>Electricity</td>
<td>26</td>
</tr>
<tr>
<td>Yanner Park</td>
<td>Townhill Rd</td>
<td>Electricity</td>
<td>1</td>
</tr>
<tr>
<td>Vehicle Fleet</td>
<td>3 Silverbrook Rd</td>
<td>Diesel, Gasoline</td>
<td>1,653</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>2,751</strong></td>
</tr>
</tbody>
</table>

*Source: MEI, 10-12-18*

c. **Summary of Energy Use Baseline and Plans for Reductions**

The Town of Sandisfield has chosen its municipal fiscal year (FY) 2017 as its energy use baseline.
Table 2. Summary of Sandisfield Energy Use Baseline FY2017

<table>
<thead>
<tr>
<th>Baseline Year FY2017</th>
<th>MMBtu Used in Baseline Year</th>
<th>Percent Total MMBtu Baseline Energy Consumption</th>
<th>Projected Planned MMBtu Savings</th>
<th>Savings as Percent of Total MMBtu Baseline Energy Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings</td>
<td>1,071</td>
<td>39%</td>
<td>513</td>
<td>19%</td>
</tr>
<tr>
<td>Vehicles</td>
<td>1,653</td>
<td>60%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Streetlights</td>
<td>26</td>
<td>1%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Transfer Station</td>
<td>5</td>
<td>-</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Park</td>
<td>1</td>
<td>-</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,751</strong></td>
<td><strong>100%</strong></td>
<td><strong>513</strong></td>
<td><strong>19%</strong></td>
</tr>
</tbody>
</table>

Source: MEI, 10-12-18

III. ENERGY USE BASELINE INVENTORY

a. Inventory Tool Used

The town is utilizing MassEnergyInsight as its energy inventory tool.

b. Baseline Year and Energy Reductions Timeline

We have chosen to use the fiscal year 2017 (FY2017), July 1, 2016, to June 30, 2017, as the baseline for this report. The five-year timeline for the town to meet its 20% energy use reduction is FY2018-FY2022.

c. Municipal Energy Consumption for the Baseline Year

Table 3. Sandisfield Energy Use Baseline FY2017

<table>
<thead>
<tr>
<th>Facility</th>
<th>Electricity kWh</th>
<th>Electricity MMBtu</th>
<th>Distillate Fuel Oil Gallons</th>
<th>Distillate Fuel Oil MMBtu</th>
<th>Gasoline Gallons</th>
<th>Gasoline MMBtu</th>
<th>Diesel Gallons</th>
<th>Diesel MMBtu</th>
<th>Total MMBtu*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town Hall Annex</td>
<td>16,983</td>
<td>58</td>
<td>2,466</td>
<td>343</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>401</td>
</tr>
<tr>
<td>Old Town Hall</td>
<td>9,951</td>
<td>34</td>
<td>1,845</td>
<td>256</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>290</td>
</tr>
<tr>
<td>Transfer Station</td>
<td>1,353</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Highway Garage</td>
<td>11,237</td>
<td>38</td>
<td>1,760</td>
<td>245</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>283</td>
</tr>
<tr>
<td>Library</td>
<td>5,100</td>
<td>17</td>
<td>537</td>
<td>75</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>92</td>
</tr>
<tr>
<td>Building Subtotal</td>
<td>44,624</td>
<td>152</td>
<td>6,608</td>
<td>919</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1,071</td>
</tr>
<tr>
<td>Streetlights</td>
<td>7,625</td>
<td>26</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>26</td>
</tr>
<tr>
<td>Yanner Park</td>
<td>351</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Vehicle Fleet</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1,076</td>
<td>133</td>
<td>10,929</td>
<td>1,519</td>
<td>1,653</td>
<td></td>
</tr>
<tr>
<td><strong>Total Energy Use</strong>*</td>
<td><strong>52,600</strong></td>
<td><strong>179</strong></td>
<td><strong>6,608</strong></td>
<td><strong>919</strong></td>
<td><strong>1,076</strong></td>
<td><strong>133</strong></td>
<td><strong>10,929</strong></td>
<td><strong>1,519</strong></td>
<td><strong>2,751</strong></td>
</tr>
</tbody>
</table>

Source: MEI, 10-12-18

*Figures may not add up exactly due to rounding
IV. ENERGY REDUCTION PLAN

a. Narrative Summary

The Town’s vehicle fleet is the largest source of greenhouse gas emissions (as calculated by carbon dioxide emission levels), accounting for 60% emissions. Emissions from diesel fuel is by far the greater source of CO₂, being used in both vehicles and heavy equipment.

Buildings account for 39% of emissions, with emissions the Town Hall Annex, Old Town Hall and Highway Garage being within a similar range of each other. As data from MassEnergyInsight shows, the Town Hall Annex overall uses the most energy, emits the most greenhouse gases and has the highest fuel costs of all town-owned buildings (refer to Table 3 and Figure 1). This is because it is occupied the most hours per week, housing administrative staff on the main floor and the Council on Aging on the bottom floor. Energy data also indicates that the Old Town Hall used a substantial amount of energy given the number of hours that it is used per week.

b. Achieving Our Energy Reduction Goal

In the autumn of 2018, the Town of Sandisfield retained the services of Energy Resources to conduct ASHRAE Level 2 building audits of all Town-owned municipal facilities. The purpose of the audits was to aid the Town in meeting Criterion #3, Energy Use Reduction, of the Green Communities Program to develop a strategy to aid the Town in achieving the 20% energy use reduction within a five-year timeline. This firm also provided a proposal for installing solar PV panels on the Town Hall Annex building. Additionally the Town received information from BETNR, the firm overseeing the construction of the new highway garage. BETNR provided information on the level of greater energy efficiency that the new highway garage will have over the old garage, given that the new building has more efficient lighting, insulated walls and insulated/draft free garage doors. The energy reduction plan is largely based on the results of the audits by Energy Resources, energy information provided by BETNR, and the strategy developed by the Sandisfield Green Team, a Select Board-appointed town committee. Reports provided by Energy Resources and BETNR are found in (Appendix B).

The Town’s overall strategy will be to reduce heating oil use, given the fuel’s cost and greenhouse gas emissions. Energy conservation measures such as sealing air leaks, weatherizing, insulating pipes and installing programmable thermostats in the Town Hall Annex, Old Town Hall and Library will be done as a first step. The Town will maximize the incentives from the MassSave and other applicable energy efficiency programs and rebates. After energy conservation measures have been addressed, the Town will consider cleaner, more efficient heating systems and solar PV panels to further reduce fossil fuel use.

The Town Hall Annex is the Town’s most heavily used building and targeted reductions here will reap substantial rewards. The Town would like to investigate either converting heat from oil to propane, or supplementing the system with air source heat pumps to reduce overall greenhouse gas emissions. The energy efficiency auditors did not analyze the Town Hall Annex for fuel conversion or clean energy technologies, so there are no real calculations that have been developed at this time. The Town has received a $12,500 META 7 grant for ASHRAE Level 2 audits, but perhaps the scope of work for that grant can be amended to develop an analysis and cost estimate of converting the heating system and installing solar PV panels at the Town Hall Annex. The Town has received a proposal for installing solar PV panels on the building which is south-facing, and perhaps more detailed design and cost estimates
can be done as part of the META 7 grant. If possible, design specifications would also be part of the META 7 grant so that Green Communities funds could be targeted for construction.

The Town would like to investigate a second possible heat pump / solar PV panel system for the Old Town Hall, although this would be a lesser priority than the Annex building. The south/southwest-facing roof is approximately 750 square feet for consideration of solar PV. However, due to the limited hours that this building is utilized, the Old Town Hall may benefit from less complex projects, such as a combination of sealing up the envelope of the building, creating separate zones for the meeting space and the police station office, and installing programmable in each zone.

Energy efficiency benefits from the construction of the new Highway Garage will be realized when it is completed and brought on line in January/February 2019. BETNR is the firm overseeing the construction of the highway garage. Whereas the old garage was an uninsulated cement brick building with leaky garage doors, inefficient forced hot air heat and inefficient fluorescent lighting, the new garage is being built to meet or exceed energy efficiency building standards. The new building has radiant floor heating with a high efficiency propane boiler, heavily insulated walls and garage doors, and LED lighting. BETNR staff have written down the specifications of the new garage, and have stated that overall, it would be a very conservative estimate to say that the new garage will reduce heating fuel and electricity energy use by at least half. For the purposes of this plan, the Town is using the conservative figure of 50% savings as part of its five-year energy reduction plan.

Reducing vehicle fuel use will continue to be a challenge given that all but one vehicle is used for public works operations or for fire or police response. In autumn 2018 the Town purchased two heavy duty diesel trucks that replaced older 1999 models. The Interim Highway Superintendent estimates that the new models will get at least three more miles per gallon of fuel than the old trucks. The Town will continue to pursue greater vehicle efficiencies in future years.

Table 4, Energy Conservation and Renewable Energy Measures, found on the following page, summarizes the projects planned by the Town to meet it’s goal of reducing greenhouse gas emissions by 16% in five years. All the projects listed in Table 4 are building improvements and have verifiable calculations provided by energy conservation specialists, documenting a 16% energy reduction. The Town is confident that the additional 4% savings will be realized through sealing of leaks in all buildings and better fuel efficiency in new highway vehicles. It should be noted that installation of solar PV on the Town Annex is not included in the plan.
Fig. 1. Buildings to Target for Efficiency Measures (MEI dated 10-12-18)

Source: MEI, 10-12-18
<table>
<thead>
<tr>
<th>Category (Select one from drop-down)</th>
<th>Building/Site Name</th>
<th>Energy Conservation Measure Name</th>
<th>ECM Type (select one from drop-down)</th>
<th>Status (select one from drop-down)</th>
<th>Status Date (Completed with month/year or planned month/year)</th>
<th>Projected Annual Electricity Savings (kWh)</th>
<th>Projected Annual Oil Savings (gallons)</th>
<th>Projected Annual Gasoline Savings (gallons)</th>
<th>Projected Annual Diesel Savings (gallons)</th>
<th>Projected Annual Cost Savings ($)</th>
<th>Total Installed Cost ($)</th>
<th>Green Community Grant ($)</th>
<th>Utility Incentives ($)</th>
<th>Net Cost ($)</th>
<th>Funding Source(s) for Net Costs</th>
<th>Reference Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings</td>
<td>Town Hall Annex</td>
<td>design heat system upgrade &amp; solar project</td>
<td>Comprehensive</td>
<td>Planned</td>
<td>1/19/2018</td>
<td>NA</td>
<td>unknown</td>
<td>unknown</td>
<td>unknown</td>
<td>$12,500</td>
<td>$0</td>
<td>NA</td>
<td>$12,500</td>
<td>META 7</td>
<td>To be determined</td>
<td></td>
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<tr>
<td>Buildings</td>
<td>Town Hall Annex</td>
<td>Attic insulation</td>
<td>Weatherization</td>
<td>Planned</td>
<td>12/31/2020</td>
<td>332</td>
<td>$676</td>
<td>$9,004</td>
<td>$0</td>
<td>$9,004</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Energy Resource Spreadsheet</td>
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<tr>
<td>Buildings</td>
<td>Town Hall Annex</td>
<td>Tips insulation</td>
<td>Hot Water</td>
<td>Planned</td>
<td>12/31/2021</td>
<td>514</td>
<td>$1,049</td>
<td>$12,820</td>
<td>$0</td>
<td>$12,820</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Energy Resource Spreadsheet</td>
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<tr>
<td>Buildings</td>
<td>Town Hall Annex</td>
<td>LED upgrade</td>
<td>Interior lighting</td>
<td>Planned</td>
<td>12/31/2020</td>
<td>5,500</td>
<td>$1,345</td>
<td>$4,680</td>
<td>$4,680</td>
<td>$1,770</td>
<td>$2,910</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Energy Resource Spreadsheet</td>
<td></td>
</tr>
<tr>
<td>Buildings</td>
<td>Old Town Hall</td>
<td>LED upgrade</td>
<td>Interior lighting</td>
<td>Planned</td>
<td>12/31/2020</td>
<td>3,474</td>
<td>$643</td>
<td>$2,633</td>
<td>$2,633</td>
<td>$1,042</td>
<td>$1,581</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Energy Resource Spreadsheet</td>
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<tr>
<td>Buildings</td>
<td>Library</td>
<td>LED upgrade</td>
<td>Interior lighting</td>
<td>Planned</td>
<td>12/31/2020</td>
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<td>$385</td>
<td>$2,089</td>
<td>$2,089</td>
<td>$385</td>
<td>$2,221</td>
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<td>None</td>
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<td>Energy Resource Spreadsheet</td>
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<tr>
<td>Buildings</td>
<td>Library</td>
<td>Attic insulation</td>
<td>Weatherization</td>
<td>Planned</td>
<td>12/31/2020</td>
<td>74</td>
<td>$151</td>
<td>$3,456</td>
<td>$3,456</td>
<td>$0</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Energy Resource Spreadsheet</td>
<td></td>
</tr>
<tr>
<td>Buildings</td>
<td>Highway Garages</td>
<td>Full 60p. improvements</td>
<td>Comprehensive</td>
<td>Active</td>
<td>2/28/2019</td>
<td>860</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>unknown</td>
<td>insurance Co.</td>
<td>null</td>
<td>null</td>
<td>null</td>
<td>null</td>
<td>null</td>
</tr>
<tr>
<td>Buildings</td>
<td>Highway Garages</td>
<td>Lighting upgrades</td>
<td>Interior Lighting</td>
<td>Active</td>
<td>2/28/2019</td>
<td>5,619</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>unknown</td>
<td>insurance Co.</td>
<td>null</td>
<td>null</td>
<td>null</td>
<td>null</td>
<td>null</td>
</tr>
<tr>
<td>To insert additional rows, select this row, right-click, and select &quot;Insert.&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL Projected Savings**

<table>
<thead>
<tr>
<th>Buildings</th>
<th>Town Hall Annex</th>
<th>16,218</th>
<th>2,830</th>
<th>0</th>
<th>0</th>
<th>4,252</th>
<th>47,682</th>
<th>35,182</th>
<th>3,180</th>
<th>41,046</th>
</tr>
</thead>
</table>

**TOTAL MBtu SAVINGS**

| Buildings | Town Hall Annex    | 449 | 55 | 393 | 0 | 0 | 16% | RUNNING TOTAL OF SAVINGS |
V. RENEWABLE ENERGY PROJECTS

Sandisfield town officials and Green Team would like to investigate clean energy opportunities, possibly with the financial support from the Green Communities program. Both the Town Hall Annex and Old Town Hall have roofs that are south-facing and unobstructed by trees. The Town would like to consider installing solar PV panels on these buildings, particularly if analyses indicate that air source heat pumps, combined with solar PVs, could substantially reduce or eliminate fossil fuel and electricity use in those buildings. The Solar Energy Resources report (Appendix B) describes the size and cost of a solar PV array that would reduce the Town Hall Annex’s current electricity use by 11,718 kWh, or 69%. Installation of PV solar panels on the Annex would reduce the overall greenhouse gas emissions of the Town by approximately 2%.

Additionally, the Town of Sandisfield has adopted zoning bylaws for the siting of Large-Scale Ground-Mounted Solar PV Installations. The Town allows large solar PV projects by-right within the Solar PV Overlay District, which consist of all land owned by the Town of Sandisfield, with the exception of Yanner Park, which is deed restricted for recreation. Four of the town-owned parcels are large enough to site a solar PV array of 250 kW or larger, after removing property boundary setbacks and wetland resource areas. Outside of the Overlay District large solar projects are allowed by Special Permit.
VI. REFERENCES


Sandisfield Master Plan Steering Committee & BRPC, 2016. *Master Plan Town of Sandisfield, Massachusetts*, Sandisfield, MA.

**MMBtu Conversion Chart**
(adapted from Energy Reduction Plan Guidance and Outline, dated 7-28-16)

**BTU Content of Common Energy Units – (1 million Btu equals 1 MMBtu)**
- 1 kilowatt hour of electricity = 0.003412 MMBtu
- 1 gal. heating oil = 0.139 MMBtu
- 1 gal. propane = 0.091 MMBtu
- 1 gal. diesel fuel = 0.139 MMBtu
- 1 gal. gasoline = 0.124 MMBtu *(based on U.S. consumption, 2007)*

VII. APPENDICES

A. Adoption Letter from Sandisfield Board of Selectmen

B. Energy Reports by Energy Resources and BETNR
A. Adoption Letter from Sandisfield Board of Selectmen
October 22, 2018

To Whom It May Concern:

Please be advised that on October 22, 2018, the Sandisfield Board of Selectmen met at a duly noticed and regularly scheduled meeting and voted to adopt the Draft Sandisfield Energy Reduction Plan for Criterion 3 of the Green Communities Application for Designation. The Board was given copies of the draft plan for review prior to the meeting.

The Board of Selectmen also voted to authorize Sandisfield Green Team to finalize the plan and submit it to the Massachusetts Department of Energy Resources as part of the Town’s application for Green Communities designation on or before October 26, 2018.

The Board of Selectmen expect to review and formally adopt the Final Sandisfield Energy Reduction Plan at a Selectmen’s meeting on November 5, 2018. If the final plan is revised significantly from that submitted for Criterion 3 of the Green Communities Application, the Town will submit the final revised plan to the DOER for its files.

Sincerely,

[Signature]

Mark Newman, Chairman
Sandisfield Board of Selectmen
B. Energy Reports by Energy Resources and BETNR
Sandisfield - Annex

66 Sandisfield Road, Sandisfield, MA

Nov 23, 2018

Efficiency Measures - Executive Summary

Executive Summary By:

Robert C. Boissonneault
JK Energy Solutions LLC
ENERGY RESOURCES LLC
(860) 391-7154
rboisssonneault@energyresourcesusa.net
A. **EXISTING CONDITIONS**

The building has older technology lighting and is lacking for insulation around hot water piping as well as building envelope.

B. **High Efficiency Plan**

1. Install a new high efficiency lighting.
2. Install pipe insulation on exposed hot water pipes.
3. Install attic insulation.

Specifically:

1) **High Performance LED Lighting Upgrade**

Please see detailed lighting proposal attached.

The current interior lighting system consists of T12 fixtures as well as incandescent lamps. We will upgrade these fixtures with energy efficient LED retrofit kits and LED PAR lamps. This retrofit will result in reduced energy consumption as well as reduced maintenance costs due to the longer lamp life of LED vs T12’s. Lighting savings are expected to be 5900 kWh/year.

2) **Straight Pipe Insulation**

There are many sections of hot water (180 degrees F) piping that are un-insulated. Please see pictures attached as well as the list below. We will insulate with 1” thick pre-molded fiberglass pipe insulation with jacket and PVC fittings. Oil savings is expected to be 514 gallons per year.

- 1” pipe - 9’
- 1” 90 Elbows - (QTY: 5)
- 1-1/4” pipe - 567’
- 1-1/4” 90 Elbows - (QTY: 100)
- 2-1/2” pipe - 18’
- 2-1/2” 90 Elbow - (QTY: 3)

3) **Attic and Crawlspace Insulation**

There is an opportunity to increase insulation levels from R8 to R-49 by installing cellulose insulation to the attic floor. There is a total of 2210 square feet in this area. We will also add fiberglass batts in the crawlspace to increase from R2 to R30. There is a total of 928 square feet in this area. Adding insulation to these areas will decrease drafty areas in the building. This will lead to reduced energy consumption and increased comfort in the building along with consistent temperatures throughout your building during the summer and winter.

Oil savings from these measures is expected to be 332 gallon per year.
Installation

- Complete mechanical and electrical installation, including necessary materials and labor for each item described above.

C. **NOT INCLUDED**
* Anything not specifically noted above, is not included.

<table>
<thead>
<tr>
<th>BUILDING NAME</th>
<th>ECM</th>
<th>Project Annual Electricity Savings (kWh)</th>
<th>Project Annual Oil Savings (gallons)</th>
<th>Project Annual Savings ($)</th>
<th>Total Project Cost ($)</th>
<th>Utility Incentive ($)</th>
<th>Net Project Cost ($)</th>
<th>Simple Payback (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annex</td>
<td>Attic Insulation</td>
<td>331.57</td>
<td>$676.40</td>
<td>$9,034.00</td>
<td>-</td>
<td>$9,034.00</td>
<td>13.31</td>
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<td></td>
<td>Straight Pipe Insulation on HW Supply - 1&quot;, 1-1/4&quot;, 2&quot;, 3/2&quot;</td>
<td>514</td>
<td>$1,048.56</td>
<td>$12,820.00</td>
<td>-</td>
<td>$12,820.00</td>
<td>12.23</td>
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<tr>
<td></td>
<td>LED Lighting Upgrade</td>
<td>5,900</td>
<td>$1,345.20</td>
<td>$4,679.50</td>
<td>$1,769.93</td>
<td>$2,909.57</td>
<td>2.16</td>
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<tr>
<td></td>
<td>TOTAL</td>
<td>5,900</td>
<td>$3,070.16</td>
<td>$26,503.50</td>
<td>$1,769.93</td>
<td>$24,733.57</td>
<td>8.06</td>
<td></td>
</tr>
</tbody>
</table>

**CUSTOMER ACKNOWLEDGEMENT**

I have read and understand the outlined scope of work provided above, and agree that the focus of the project is energy savings. I understand that any savings stated above or within any Utility documents are estimated based upon a comparison of the baseline system to the high efficiency system, and using customer provided inputs for operating parameters.

Signature: ______________________

Name: ______________________

Title: ______________________

Date: ______________________

Initials: ________ Date_______

Page 3 of 6
ADDENDUM:  PICTURES OF UN-INSULATED PIPING (SANDISFIELD ANNEX)
Comprehensive Energy Efficient Facility Upgrade

Developed by JK Energy Solutions for:

Sandisfield - Annex
66 Sandisfield Road, Sandisfield
Fred Ventresco
603-361-8448

JK Energy Consultant:
Darek Chomiak
413-376-8575
dchomiak@jkennergysolutions.net
Issued on: October 9, 2018
Expires on: November 8, 2018

JK Energy Solutions is an approved contractor for the Eversource MA Small Business DI Program
Project Savings Overview

**INPUT FACTORS:**
- kWh Rate: $0.228 / kWh
- Therms Rate: Varies by Location
- Hours of Operation: 80 measures
- Existing Measure Count: 80 measures
- Proposed Measure Count: 80 measures

**ENERGY and FINANCIAL SAVINGS:**
- Annual kWh Saved: 5,900 kWh
- Total Therms Saved: 
- Total Annual Savings ($): $1,343.38

**FACILITY INVESTMENT:**
- Turnkey Project Cost: $4,679.50
- Utility Incentive: $1,769.93
- MA Sales Tax*: $0.00
- **Net Total Investment**: $2,909.57

**FINANCIAL ANALYSIS:**
- Simple Payback (years): 2.17
- Project ROI: 46.17%
- Number of Months**: 24 months
- Monthly Payment: $121.23 / Monthly Savings: $111.95

Initials ________________ Date ________________

*Tax is calculated as 6.25% of retail materials cost only. **Interest-free financing will be provided off bill through Eversource MA. Customer has 30 days to act on this proposal.
## Detailed Energy Analysis

<table>
<thead>
<tr>
<th>ECM</th>
<th>Location</th>
<th>Existing System</th>
<th>Qty</th>
<th>Fixture Watts</th>
<th>Annual HRS</th>
<th>Replacement System</th>
<th>Qty</th>
<th>Fixture Watts</th>
<th>Annual HRS</th>
<th>Watts Saved</th>
<th>kWh Saved</th>
<th>Annual $ Savings</th>
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<tbody>
<tr>
<td>1</td>
<td>Main Hallway by Back Entrance</td>
<td>1 x 4 1L T12 34W</td>
<td>2</td>
<td>40</td>
<td>2,000</td>
<td>Install 4' 1L Type C w/ External Driver</td>
<td>2</td>
<td>16</td>
<td>2,000</td>
<td>48.0</td>
<td>96.0</td>
<td>$ 21.86</td>
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<tr>
<td>2</td>
<td>Main Hallway by Back Entrance</td>
<td>100W Incandescent Screw-in</td>
<td>1</td>
<td>40</td>
<td>8,760</td>
<td>LED Exit w/ Batt, Backup</td>
<td>1</td>
<td>2</td>
<td>8,760</td>
<td>38.0</td>
<td>332.9</td>
<td>$ 75.80</td>
</tr>
<tr>
<td>3</td>
<td>Outside Parking Lot</td>
<td>60W Incandescent Screw-in</td>
<td>5</td>
<td>100</td>
<td>1,500</td>
<td>12W PAR 38 LED</td>
<td>6</td>
<td>12</td>
<td>1,500</td>
<td>528.0</td>
<td>792.0</td>
<td>$ 180.34</td>
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<tr>
<td>4</td>
<td>Outside above the Front Door</td>
<td>100W Incandescent Screw-in</td>
<td>1</td>
<td>60</td>
<td>1,500</td>
<td>9.5W A19 LED</td>
<td>1</td>
<td>9.5</td>
<td>1,500</td>
<td>50.5</td>
<td>75.8</td>
<td>$ 17.25</td>
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<tr>
<td>5</td>
<td>Outside Back</td>
<td>MR16 3W</td>
<td>2</td>
<td>100</td>
<td>1,500</td>
<td>12W PAR 38 LED</td>
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<td>12</td>
<td>1,500</td>
<td>176.0</td>
<td>264.0</td>
<td>$ 63.11</td>
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<td>6</td>
<td>Outside Left Side in VT Fixture</td>
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<td>50</td>
<td>1,250</td>
<td>9.5W A19 LED</td>
<td>2</td>
<td>9.5</td>
<td>1,250</td>
<td>101.0</td>
<td>162.3</td>
<td>$ 29.75</td>
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<tr>
<td>7</td>
<td>Foyer's Office</td>
<td>1 x 4 2L T12 34W</td>
<td>2</td>
<td>72</td>
<td>2,000</td>
<td>Install 4' 2L Type C w/ External Driver</td>
<td>2</td>
<td>32</td>
<td>2,000</td>
<td>80.0</td>
<td>150.0</td>
<td>$ 36.43</td>
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<td>Hallway Storage</td>
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<td>250</td>
<td>9.5W A19 LED</td>
<td>2</td>
<td>9.5</td>
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<td>101.0</td>
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<td>$ 5.75</td>
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<td>9</td>
<td>Men's Room</td>
<td>15W Compact Fluorescent</td>
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<td>15</td>
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<td>9.5W A19 LED</td>
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<td>9.5</td>
<td>350</td>
<td>5.5</td>
<td>1.9</td>
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<td>Men's Room</td>
<td>1 x 4 1L T12 34W</td>
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<td>350</td>
<td>Install 4' 1L Type C w/ External Driver</td>
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<td>16</td>
<td>350</td>
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<td>11</td>
<td>Women's Room</td>
<td>1 x 4 2L T12 34W</td>
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<td>72</td>
<td>400</td>
<td>Install 4' 2L Type C w/ External Driver</td>
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<td>32</td>
<td>400</td>
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<td>32.0</td>
<td>$ 7.29</td>
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<td>Server Room</td>
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<td>1</td>
<td>60</td>
<td>500</td>
<td>9.5W A19 LED</td>
<td>1</td>
<td>9.5</td>
<td>500</td>
<td>50.5</td>
<td>25.3</td>
<td>$ 5.75</td>
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<td>13</td>
<td>Town Clerk's Office</td>
<td>1 x 4 2L T12 34W</td>
<td>12</td>
<td>72</td>
<td>2,000</td>
<td>Install 4' 2L Type C w/ External Driver</td>
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<td>32</td>
<td>2,000</td>
<td>480.0</td>
<td>960.0</td>
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<td>Assessor's &amp; Tax Collectors Office</td>
<td>1 x 4 2L T12 34W</td>
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<td>72</td>
<td>2,000</td>
<td>Install 4' 2L Type C w/ External Driver</td>
<td>12</td>
<td>32</td>
<td>2,000</td>
<td>480.0</td>
<td>960.0</td>
<td>$ 219.59</td>
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<td>15</td>
<td>Inside by Front Entrance</td>
<td>1 x 4 1L T12 34W</td>
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<td>77</td>
<td>7,000</td>
<td>Install 4' 2L Type C w/ External Driver</td>
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<td>37</td>
<td>7,000</td>
<td>80.0</td>
<td>18,220</td>
<td>$ 18,220</td>
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<td>16</td>
<td>Inside by Front Entrance</td>
<td>Standard Exit Sign</td>
<td>1</td>
<td>40</td>
<td>8,760</td>
<td>LED Exit w/ Batt, Backup</td>
<td>1</td>
<td>2</td>
<td>8,760</td>
<td>38.0</td>
<td>322.9</td>
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<td>2,000</td>
<td>Install 4' 2L Type C w/ External Driver</td>
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<td>32</td>
<td>2,000</td>
<td>80.0</td>
<td>18.22</td>
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<td>18</td>
<td>Basement Stairway</td>
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<td>1</td>
<td>40</td>
<td>2,000</td>
<td>Install 4' 1L Type C w/ External Driver</td>
<td>1</td>
<td>16</td>
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<td>93.0</td>
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<td>Install 4' 2L Type C w/ External Driver</td>
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<td>Basement</td>
<td>Standard Exit Sign</td>
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<td>20</td>
<td>8,760</td>
<td>LED Exit w/ Batt, Backup</td>
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<td>2</td>
<td>8,760</td>
<td>18.0</td>
<td>157.7</td>
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<td>21</td>
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<td>40</td>
<td>8,760</td>
<td>LED Exit w/ Batt, Backup</td>
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<td>2</td>
<td>8,760</td>
<td>78.0</td>
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<td>$ 151.59</td>
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<td>Basement Restroom</td>
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<td>250</td>
<td>9.5W A19 LED</td>
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<td>9.5</td>
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<td>23</td>
<td>Biller Room</td>
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<td>250</td>
<td>9.5W A19 LED</td>
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<td>9.5</td>
<td>250</td>
<td>101.0</td>
<td>25.3</td>
<td>$ 5.75</td>
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**Total** 80 80 3,581.5 5,899.8 $ 1,343.38
## 10 Year Cash Flow Analysis

<table>
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<tr>
<th>YEAR</th>
<th>YEARLY SAVINGS</th>
<th>YEARLY COST</th>
<th>CUMULATIVE CASH FLOW</th>
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</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>$1,343.38</td>
<td>$1,454.79</td>
<td>-$111.41</td>
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<tr>
<td>Year 2</td>
<td>$1,343.38</td>
<td>$1,454.79</td>
<td>-$222.81</td>
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<tr>
<td>Year 3</td>
<td>$1,343.38</td>
<td>$0.00</td>
<td>$1,120.57</td>
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<tr>
<td>Year 4</td>
<td>$1,343.38</td>
<td>$0.00</td>
<td>$2,463.95</td>
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<tr>
<td>Year 5</td>
<td>$1,343.38</td>
<td>$0.00</td>
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<td>Year 6</td>
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<td>$5,150.70</td>
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<td>Year 7</td>
<td>$1,343.38</td>
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<td>Year 8</td>
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<tr>
<td>Year 9</td>
<td>$1,343.38</td>
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<td>$9,180.84</td>
</tr>
<tr>
<td>Year 10</td>
<td>$1,343.38</td>
<td>$0.00</td>
<td>$10,524.22</td>
</tr>
</tbody>
</table>

| Totals | $13,433.79    | $2,909.57   | $10,524.22           |

### CUMULATIVE $$ Savings

![Cumulative Savings Chart](image)
Project Benefits Summary

Reduce Energy Consumption 65%
Reduce Annual Utility Cost $1,343.38
10 Year Positive Cash Flow $10,524.22
Reduce Annual Maintenance Costs
Instant on / Instant off Lighting
Longer Life Lighting System
Improved Color Rendering
Disposal/Recycling of higher mercury lamps

Printed Name ____________________________

Signature ___________________________________________

Company Title _________________________________________

Date ________________________________________________
The JK Energy Solutions turnkey solution includes the recycling of your existing technology and the disposal of non-hazardous waste. Materials and workmanship of your newly upgraded measures are fully warranted as follows:

- Workmanship – JK Energy Solutions 2 Year Warranty
- Products - Manufacturer’s Material Warranty

Your utility incentivized energy efficiency upgrade will result in a large reduction in operating costs for your facility. In addition, the new equipment will improve the quality of the overall working environment.

Customer signature of the proposal is authorization for JK Energy Solutions to proceed with construction. Customer agrees to promptly execute any documents required by Eversource to effect payment to JK Energy Solutions.

Project savings analysis is based on current burnt out lights being relamped prior to project installation.

This proposal is only guaranteed for 30 days from date of initial presentation.
Impact Summary

Below is an outline of the financial and environmental impacts of installing a solar array. Included is a comparison of paths to ownership, and how they correspond to Town of Sandisfield.

**Purchase Price and Net Cost**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Capital Cost</td>
<td>$35,381.36</td>
</tr>
<tr>
<td>Savings-to-Investment Ratio</td>
<td>3.1</td>
</tr>
<tr>
<td>Cashflow Payback</td>
<td>4.1 years</td>
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<tr>
<td>Internal Rate of Return</td>
<td>31.4%</td>
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<tr>
<td>Net Present Value</td>
<td>$45,586.92</td>
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</table>

**Clean Energy Financing**

A common path to purchasing a solar array is using clean energy specific low-interest financing or leases. These leverage the savings, incentives and tax benefits to create positive cashflow situations for businesses.

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
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<td>Financial model:</td>
<td>Loan</td>
</tr>
<tr>
<td>Monthly Payment:</td>
<td>$293.50</td>
</tr>
<tr>
<td>Cashflow during Repayment</td>
<td>$406.23</td>
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<tr>
<td>Savings during Repayment</td>
<td>$112.73</td>
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<tr>
<td>Repayment Term:</td>
<td>20 Years</td>
</tr>
<tr>
<td>Interest Rate:</td>
<td>6.35% APR</td>
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<tr>
<td>25-Year Net Cashflow</td>
<td>$45,339.85</td>
</tr>
</tbody>
</table>

**Environmental Impact**

This system’s annual energy production of 15300 kWh reduces CO2 emissions by 24098 lbs per year

This is the equivalent of:

- **10.2** Acres of US Forest growth in a year
- **2.3** Passenger vehicles taken off the road
- **1209.9** Gallons of gasoline consumed in a year

Prepared for budgetary purposes on 10/25/2018
**PROJECT SUMMARY**

Solar Energy Resources proposes to install 11.9 kW of photovoltaic solar panels at Town of Sandisfield. This system will produce 69% of the site’s current kWh use, lowering their utility bills. Additional state and federal incentives provide payments for energy produced (SMART) and a tax credit, accelerating the system’s return to just 4.1 years. Optionally, the system can be financed for immediate savings and cashflow.

![FUTURE COST COMPARISON](image)

### HOW YOUR ELECTRIC BILL WILL CHANGE

<table>
<thead>
<tr>
<th>Cash Option (Full price paid first year)</th>
<th>Financed Option (No out of pocket expense)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project purchased outright or through personal bank</strong></td>
<td><strong>Project financed through clean energy financing program</strong></td>
</tr>
<tr>
<td>Current Monthly Bill*</td>
<td>Current Monthly Bill*</td>
</tr>
<tr>
<td>- Energy Savings</td>
<td>- Energy Savings</td>
</tr>
<tr>
<td>= New Utility Bill</td>
<td>= New Utility Bill</td>
</tr>
<tr>
<td>- SMART Payments</td>
<td>- SMART Payments</td>
</tr>
<tr>
<td>New Monthly Cost</td>
<td>+ Finance Payment</td>
</tr>
<tr>
<td><strong>Monthly Difference from Old Bill</strong></td>
<td>New Monthly Cost</td>
</tr>
<tr>
<td>$370.01</td>
<td>$267.30</td>
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<tr>
<td>$181.33</td>
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<td>$188.67</td>
<td>$188.67</td>
</tr>
<tr>
<td>$214.88</td>
<td>$293.50</td>
</tr>
</tbody>
</table>

*Current Monthly Bill amount reflects an average of utility costs. Actual bill and savings will vary on a monthly basis.

Prepared for budgetary purposes on 10/25/2018
STATE AND FEDERAL INCENTIVES

Solar projects installed in MA may be eligible to participate in the state SMART program, allowing them to earn money for the power they produce in addition to the savings on utility bills. An Investment Tax Credit of 30% allows sites to reduce their tax liability, instead turning dollars which would ordinarily be paid in tax into an investment in the solar array.

**State Incentive - MA SMART Program**

*How it works:*

Sites enrolled in the MA SMART Program receive payments for power they produced in addition to the cost of energy being eliminated from their bill, providing a two-pronged benefit.

<table>
<thead>
<tr>
<th>Years of Income</th>
<th>10 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Est. Annual Payment Amount</td>
<td>$2,578.51</td>
</tr>
<tr>
<td>Est. Lifetime Payments Value</td>
<td>$22,238.65</td>
</tr>
</tbody>
</table>

**Federal Incentive - Tax Credit and Accelerated Depreciation**

*How it works:*

Organizations which purchase and own a Solar Array can claim a Tax Credit against their Federal Income Taxes. Additionally, solar is depreciated over the 5-year MACRS schedule, or as a single year 179 Capital Expense. This means businesses can turn some or all of their annual taxes into an investment reducing their operating costs and/or providing long term income. A tax rate of 26.99% is assumed below:

| Investment Tax Credit | $10,614.41 |
| Additional First Year Tax Savings | $8,117.01 |
| Remaining Tax Savings | $0.00 |

**Total Tax Benefit:** $18,731.42
**Warranty and Maintenance**

Solar arrays are a largely passive investment, having very few moving components and requiring very little maintenance or upkeep. The array here includes a solar monitoring system which tracks production against estimates, and can be configured to share alerts with multiple parties in the event of any damage or equipment failures. Additionally, systems come with long warranties intended to protect the investment over the long lifetime of operation.

**System Summary**

<table>
<thead>
<tr>
<th>System Size (DC)</th>
<th>11.9 kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>kWh Production</td>
<td>15,300 kWh</td>
</tr>
<tr>
<td>Current Consumption</td>
<td>22,068 kWh</td>
</tr>
<tr>
<td>Panels</td>
<td>39x Q Cells 305W</td>
</tr>
<tr>
<td>Inverters</td>
<td>1x SolarEdge SE10000H-US</td>
</tr>
<tr>
<td>Mounting</td>
<td>Roof-Mounted Array</td>
</tr>
</tbody>
</table>

**Notes**
- Includes PV Monitoring System
- Complete turnkey installation, orientation and start-up
- Includes permitting and interconnection applications

**Warranty Timeframe**

- **Workmanship**
- **Mounting**
- **Inverters**
- **Panels**
## Commercial Purchase Analysis for Town of Sandisfield

<table>
<thead>
<tr>
<th>Year</th>
<th>Utility Cost Savings</th>
<th>Capital Cost</th>
<th>Annual Payment if - or -</th>
<th>Energy Savings</th>
<th>Innovation Tax Credit**</th>
<th>Tax Impact</th>
<th>Projected Cash Flow</th>
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<td>$12,911.40</td>
<td>$19,874.36</td>
</tr>
</tbody>
</table>

### Total:
- 34,406 kWh
- $35,213.65
- $15,300
- $22,238.65
- $73,231.72
- $10,614.41
- $6,002.21
- $5,758.04
- $8,117.01

### Cumulative Cash Flows:
- $72,820.23
- $45,339.85

### Key Assumptions:
- **REC Value:** $310.75
- **Utility Rate:** $0.1432
- **Loan Term (years):** 20
- **Electric Inflation:** 2.6%
- **Variable Rate:** 6.4%
- **Tax Rate:** 27%
- **Inverter Efficiency:** 95%
- **Inverter Replacement:** 25 years

Solar Energy Resources provides this analysis in order to show possible financial implications of a solar purchase and installation. Organizations are advised to seek their own tax and financial experts, and the information contained in this model is not to be relied upon for tax or financial purposes.

*Energy Savings represents the estimated dollar value of kWh saved at the projected yearly rate.*

*In the case of an operating lease, the investment tax credit is taken by the leasing company and the figure noted here is only applicable to the purchase model.*

**Prepared for budgetary purposes on 10/25/2018**
LETTER OF INTENT

This Letter of Intent (LOI), issued as of 10/25/2018, is by and between Solar Energy Resources (Contractor) and Town of Sandisfield of Sandisfield, MA (Customer).

DESCRIPTION
SOLAR ENERGY RESOURCES (Contractor) will supply all labor, tools, equipment and material to professionally install a photovoltaic system per the schedule in the attached proposal dated 10/25/2018, which is attached hereto and made a part hereof.

FEES AND PAYMENTS
Please denote the preferred payment method by initialing and dating where indicated

<table>
<thead>
<tr>
<th>Initial</th>
<th>Finance Purchase - Proceeding with installation contingent upon approval by suggested finance option from proposal or equivalent service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td></td>
</tr>
</tbody>
</table>

-or-

<table>
<thead>
<tr>
<th>Initial</th>
<th>Cash Purchase - Total Project Cost $35,381.36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Down Payment $3,538.14</td>
</tr>
<tr>
<td></td>
<td>Installment Payment (due upon material delivery) $14,152.54</td>
</tr>
<tr>
<td></td>
<td>Final Payment (due upon installation) $17,690.68</td>
</tr>
</tbody>
</table>

CONTRACTORS INCLUSIONS
a) System Design and Engineering
b) All Standard Installation Components
c) All Permitting Applications, Costs, and Permit Service Fees
d) Permit Inspection Oversight and Scheduling
e) Utility Company Interconnection Application, Oversight, and Meter Scheduling
f) Assistance with Renewable Energy Credit Applications and Processing
g) Remote Monitoring Commissioning, Set Up, and Training if selected
h) Operations and Maintenance Training and Orientation

TERM OF LETTER OF INTENT
Customer agrees to the payment schedule initialed above. If the Cash Purchase option is selected and any payment remains outstanding for more than thirty (30) days, Contractor has a right to terminate this agreement and declare amounts for all work completed due and payable. In the event of the sale or closing of the business the Customer will be required to pay any unpaid balance of this Agreement within thirty (30) days.

The Contractor shall be entitled to collect from the Customer, reasonable costs of collection pursuant to any default, including but not limited to, attorney fees, court costs, marshal fees and service fees.

The Contractor shall also have the right to assert any UCC-1 liens on the equipment installed at Customer’s premises. In the event that Contractor decides to assert UCC-1 lien, it shall notify the Customer and provide Customer with a timely notice of satisfaction when this agreement is complete.
CHANGES IN SERVICES
Changes in the Services to be performed may be accomplished by a Change Order without invalidating this Agreement. Contractor will provide a Change Order to be signed by both Customer and Contractor stating their agreement with respect to change in the scope of Services.

CONTRACTOR’S EXCLUSIONS
Contractor shall not be responsible or liable for the condition, maintenance or repair of any electrical wiring located in or on Customer’s premises. Nor shall Contractor be liable or responsible for repairs or replacements of electrical equipment damaged or destroyed by acts or negligence of persons not under the direct supervision of the Contractor.

SITE CONDITIONS
Final Construction Design by the Contractor will commence upon receipt of the down payment by the Customer. If during final design development, it is determined by the Contractor that the site conditions do not allow for an effective installation, Contractor and Customer shall have the option to terminate or modify this agreement. In the result of termination, the Contractor will refund the Customer the previously paid down payment.

UTILITY INTERCONNECT AND RECS
Utility interaction by the Contractor will commence upon receipt of the down payment by the Customer. Upon completion of the request for RECs, should the request be denied, Customer and Contractor have the option to modify or terminate this agreement. Upon completion of the request for interconnect, should the Contractor determine that the cost of connection is excessive, both the Customer and Contractor have the option to terminate or modify this agreement. In the result of termination, the Contractor will refund the Customer the previously paid down payment.

ENTIRE CONTRACT
This Letter of Intent constitutes the entire agreement between the parties. This Agreement is intended as the final expression and as a complete and exclusive statement of the terms of the parties’ agreement. This Letter of Intent is not valid until countersigned by Solar Energy Resources management.

NOTICES
For purposes of notice, the Contractor’s address is 76 Watertown Road, Thomaston, CT 06787, and the Customer’s address is:

______________________________________________________________

ACCEPTANCE AND APPROVAL
This price is good for 60 days from the date of issue. By signing below, the parties hereto have executed this Letter of Intent and certify that they have read, understood and agree to the terms of this agreement this _____ day of ____________, 2018.

Energy Resources                                             Town of Sandisfield
By: ________________________________________________________ By: ________________________________

(Print Name)                                               (Print Name)
Date: ____________________________________________________ Date: ___________________________________
Prepared for:

Town of Sandisfield

66 Sandisfield Rd
Sandisfield, MA 01255
PROJECT SUMMARY

Solar Energy Resources proposes to install 11.9 kW of photovoltaic solar panels at Town of Sandisfield. This system will produce 69% of the site’s current energy needs and lower their utility bills. By acquiring it through a Power Purchase Agreement, Town of Sandisfield incurs no out of pocket expense and instead only purchases what the solar system produces at a lowered cost of power. This can be at a low, flat rate which is fixed for 20 years, or a variable rate which starts lower and climbs by 2% each year, tracking the average utility inflation rate and providing consistent savings.

![Graph showing PPA Cost Comparison]

![Graph showing Supply of Electricity]

HOW YOUR ELECTRIC BILL WILL CHANGE

The proposed solar array will annually produce 15300 kWh. Below is an outline of how continuing to purchase it from the utility company would compare to getting it through a solar PPA.

<table>
<thead>
<tr>
<th></th>
<th>Current Cost of Power</th>
<th>First Year Cost:</th>
<th>Twenty-Year Cost:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$0.1422 per kWh</td>
<td>$2,175.97</td>
<td>$54,948.11</td>
</tr>
</tbody>
</table>

**Fixed Rate PPA**

- $0.1150 per kWh
- 20-Year Stable Cost of Power: Savings $416.47
- Twenty-Year Cost: Savings $21,380.54

**Variable Rate PPA**

- $0.1000 per kWh
- 20-Year Escalating Cost of Power: Savings $645.97
- Twenty-Year Cost: Savings $19,603.72

Prepared for budgetary purposes on 10/25/2018
Page 2
**System Impact**

Solar arrays are a largely passive investment, having very few moving components and requiring very little maintenance or upkeep. The array here includes a solar monitoring system which tracks production against estimates, and can be configured to share alerts with multiple parties in the event of any damage or equipment failures.

### System Summary

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Size (DC)</td>
<td>11.9 kW</td>
</tr>
<tr>
<td>kWh Production</td>
<td>15,300 kWh</td>
</tr>
<tr>
<td>Current Consumption</td>
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</tr>
<tr>
<td>Mounting</td>
<td>Roof-Mounted Array</td>
</tr>
</tbody>
</table>
| Notes            | o Includes PV Monitoring System  
|                  | o Complete turn-key installation, orientation and start-up commissioning 
|                  | o Includes permitting and interconnection applications |

### Environmental Impact

This system's annual energy production of 15300 kWh reduces CO2 emissions by 24098 lbs per year

This is the equivalent of:

- **10.2** Acres of US Forest growth in a year
- **2.3** Passenger vehicles taken off the road
- **1209.9** Gallons of gasoline consumed in a year
## Commercial Purchase Analysis for Town of Sandisfield

<table>
<thead>
<tr>
<th>Year</th>
<th>Solar kWh Produced</th>
<th>$/kWh Utility Rate</th>
<th>$/kWh Fixed Rate PPA</th>
<th>$/kWh Escalating Rate PPA</th>
<th>Annual Cost Comparison of Produced Power</th>
<th>Cash Impact of Solar</th>
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<tbody>
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<td>Fixed Rate PPA - or - Variable Rate PPA</td>
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<td>- or - Fixed Rate PPA - or - Variable Rate PPA</td>
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<td>$0.1294</td>
<td>$2,956.32 - $1,648.50 - $1,854.36</td>
<td>$1,307.82 - $1,101.97</td>
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<td>15</td>
<td>14,263</td>
<td>$0.2122</td>
<td>$0.1150</td>
<td>$0.1319</td>
<td>$3,026.35 - $1,640.26 - $1,881.99</td>
<td>$1,366.59 - $1,144.66</td>
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<td>16</td>
<td>14,192</td>
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<td>$0.1150</td>
<td>$0.1346</td>
<td>$3,099.05 - $1,632.06 - $1,910.03</td>
<td>$1,446.99 - $1,189.02</td>
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<td>14,121</td>
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<td>$0.1150</td>
<td>$0.1373</td>
<td>$3,172.99 - $1,623.90 - $1,938.49</td>
<td>$1,549.08 - $1,234.49</td>
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<td>14,050</td>
<td>$0.2312</td>
<td>$0.1150</td>
<td>$0.1400</td>
<td>$3,248.67 - $1,615.78 - $1,967.37</td>
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<td>19</td>
<td>13,980</td>
<td>$0.2379</td>
<td>$0.1150</td>
<td>$0.1428</td>
<td>$3,326.17 - $1,607.70 - $1,996.69</td>
<td>$1,718.47 - $1,329.48</td>
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<td>20</td>
<td>13,910</td>
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<td>$0.1150</td>
<td>$0.1457</td>
<td>$3,405.51 - $1,599.66 - $2,026.44</td>
<td>$1,805.85 - $1,379.08</td>
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<tr>
<td>Total</td>
<td>291,892 kWh</td>
<td></td>
<td></td>
<td></td>
<td>$54,948.11 - vs - $33,567.57 - vs - $35,344.40</td>
<td>$21,380.54 - vs - $19,603.72</td>
</tr>
</tbody>
</table>

### Key Assumptions:
- **Fixed PPA kWh Cost**: $0.1150
- **Utility Rate**: $0.1422
- **Electric Inflation**: 2.9%
- **Escalation Rate**: 2.0%
- **Panel Loss**: 0.5%
- **Solar Energy Resources** provides this analysis in order to show possible financial implications of a solar PPA and installation. Organizations are advised to seek their own tax and financial experts, and the information contained in this model is not to be relied on for tax or financial purposes.

*Energy Savings projects the estimated dollar value of kWh saved at the projected yearly rate*
Sandisfield – Old Town Hall

3 Silverbrook Road, Sandisfield, MA

Nov 23, 2018

Efficiency Measures - Executive Summary

Executive Summary By:

Robert C. Boissonneault
JK Energy Solutions LLC
 ENERGY RESOURCES LLC
(860) 391-7154
rboisssonneault@energyresourcesusa.net
A. **EXISTING CONDITIONS**

The building has older technology lighting and is lacking for insulation in the attic.

B. **High Efficiency Plan**

1. Install a new high efficiency lighting.
2. Install attic insulation.

Specifically:

1) **High Performance LED Lighting Upgrade**

The current interior lighting system consists of T12 fixtures as well as CFL and incandescent lamps. We will upgrade these fixtures with energy efficient LED retrofit kits and LED PAR lamps. This retrofit will result in reduced energy consumption as well as reduced maintenance costs due to the longer lamp life of LED vs T12’s. Lighting savings are expected to be 3474 kwh/year.

2) **Attic Insulation**

There is an opportunity to increase insulation levels from R-28 to R-49 by installing cellulose insulation to the attic floor. There is a total of 1650 square feet in this area. Adding insulation to these areas will decrease drafty areas in the building. This will lead to reduced energy consumption and increased comfort in the building along with consistent temperatures throughout your building during the summer and winter.

Oil savings from these measures is expected to be 25 gallon per year.

**Installation**

- Complete mechanical and electrical installation, including necessary materials and labor for each item described above.

C. **NOT INCLUDED**

* Anything not specifically noted above, is not included.
<table>
<thead>
<tr>
<th>BUILDING NAME</th>
<th>ECM</th>
<th>Project Annual Electricity Savings (kWh)</th>
<th>Project Annual Oil Savings (gallons)</th>
<th>Project Annual Savings ($)</th>
<th>Total Project Cost ($)</th>
<th>Utility Incentive ($)</th>
<th>Net Project Cost ($)</th>
<th>Simple Payback (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old Town Hall</td>
<td>Attic Insulation</td>
<td>2463</td>
<td>$50.00</td>
<td>$3,905.00</td>
<td>$ -</td>
<td>$3,905.00</td>
<td>78.10</td>
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<td></td>
<td>LED Lighting Upgrade</td>
<td>3,474</td>
<td>$642.69</td>
<td>$2,632.69</td>
<td>$1,042.16</td>
<td>$1,590.44</td>
<td>2.47</td>
<td></td>
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<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>3,474</strong></td>
<td><strong>$692.69</strong></td>
<td><strong>$6,537.69</strong></td>
<td><strong>$1,042.16</strong></td>
<td><strong>$5,495.44</strong></td>
<td><strong>7.93</strong></td>
<td></td>
</tr>
</tbody>
</table>

**CUSTOMER ACKNOWLEDGEMENT**

I have read and understand the outlined scope of work provided above, and agree that the focus of the project is energy savings. I understand that any savings stated above or within any Utility documents are estimated based upon a comparison of the baseline system to the high efficiency system, and using customer provided inputs for operating parameters.

Signature: ____________________________

Name: ________________________________

Title: ________________________________

Date: ________________________________

Initials: _______ Date_______
ADDENDUM:  PICTURES FOR ATTIC INSULATION (SANDISFIELD Old Town Hall)

Ceiling above the ceiling

Initials: _______ Date_______  Page 4 of 5
Comprehensive Energy Efficient Facility Upgrade

Developed by JK Energy Solutions for:

Old Town Hall
3 Silverbrook Road, Sandisfield
Fred Ventresco
603-361-8448

JK Energy Consultant:
Derek Chomiak
413-376-8575
dchomiak@jkenerysolutions.net
Issued on: October 9, 2018
Expires on: November 8, 2018

JK Energy Solutions is an approved contractor for the Eversource MA Small Business DI Program
Project Savings Overview

INPUT FACTORS:
- kWh Rate: $0.185 / kWh
- Therms Rate: Varies by Location
- Hours of Operation: 33 measures
- Existing Measure Count: 33 measures
- Proposed Measure Count: 33 measures

ENERGY and FINANCIAL SAVINGS:
- Annual kWh Saved: 3,474 kWh
- Total Therms Saved: $642.66

FACILITY INVESTMENT:
- Turnkey Project Cost: $2,632.60
- Utility Incentive: $1,042.16
- MA Sales Tax*: $0.00
- Net Total Investment: $1,590.44

FINANCIAL ANALYSIS:
- Simple Payback (years): 2.47
- Project ROI: 40.41%
- Number of Months**: 24 months
- Monthly Payment: $66.27 / Monthly Savings: $53.56

Initials _______________ Date _______________

*Tax is calculated as 6.25% of retail materials cost only. **Interest-free financing will be provided off bill through Eversource MA. Customer has 30 days to act on this proposal.
## Detailed Energy Solutions

<table>
<thead>
<tr>
<th>ECM</th>
<th>Location</th>
<th>Existing System</th>
<th>Qty</th>
<th>Fixture Watts</th>
<th>Annual HRS</th>
<th>Replacement System</th>
<th>Qty</th>
<th>Fixture Watts</th>
<th>Annual HRS</th>
<th>Watts Saved</th>
<th>kWh Saved</th>
<th>Annual $ Savings</th>
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<tr>
<td>1</td>
<td>Main Entrance</td>
<td>2 x 4 4L T12 34W</td>
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<td>140</td>
<td>2,000</td>
<td>Instalit 4&quot; 4L Type C w/ External Driver</td>
<td>15</td>
<td>60</td>
<td>2,000</td>
<td>1,200.0</td>
<td>2,400.0</td>
<td>$ 444.00</td>
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<td>2</td>
<td>Back Left Side Storage</td>
<td>1 x 4 2L T12 34W</td>
<td>2</td>
<td>70</td>
<td>500</td>
<td>Instalit 4&quot; 2L Type C w/ External Driver</td>
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<td>32</td>
<td>500</td>
<td>76.0</td>
<td>38.0</td>
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<td>2.1</td>
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<td>Add New</td>
<td>1</td>
<td>64</td>
<td>500</td>
<td>Wall Sensor</td>
<td>1</td>
<td>64</td>
<td>500</td>
<td>0.0</td>
<td>0.0</td>
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<td>3</td>
<td>Back Hallway</td>
<td>60W Incandescent Screw-in</td>
<td>2</td>
<td>60</td>
<td>2,000</td>
<td>6,5W A19 LED</td>
<td>2</td>
<td>9.5</td>
<td>2,000</td>
<td>101.0</td>
<td>202.0</td>
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<td>60</td>
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<td>9.5</td>
<td>300</td>
<td>101.0</td>
<td>30.5</td>
<td>$ 5.61</td>
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<td>Back Bathroom</td>
<td>60W Incandescent Screw-in</td>
<td>2</td>
<td>60</td>
<td>300</td>
<td>6,5W A19 LED</td>
<td>2</td>
<td>9.5</td>
<td>300</td>
<td>101.0</td>
<td>30.5</td>
<td>$ 5.61</td>
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<tr>
<td>6</td>
<td>Outside Front</td>
<td>100W Incandescent Screw-in</td>
<td>2</td>
<td>100</td>
<td>1,500</td>
<td>12W PAR 38 LED</td>
<td>2</td>
<td>12</td>
<td>1,500</td>
<td>176.0</td>
<td>24.0</td>
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<td>Outside Front</td>
<td>23W Compact Fluorescent</td>
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<td>23</td>
<td>1,500</td>
<td>12W PAR 38 LED</td>
<td>2</td>
<td>12</td>
<td>1,500</td>
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<td>33.0</td>
<td>$ 6.11</td>
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<td>8</td>
<td>Police Station</td>
<td>1 x 4 2L T12 34W</td>
<td>2</td>
<td>70</td>
<td>1,500</td>
<td>Instalit 4&quot; 2L Type C w/ External Driver</td>
<td>2</td>
<td>32</td>
<td>1,500</td>
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<td>1,500</td>
<td>RAB FLILED18</td>
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<td>22</td>
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<td>60W Incandescent Screw-in</td>
<td>1</td>
<td>60</td>
<td>1,500</td>
<td>6,5W A19 LED</td>
<td>1</td>
<td>9.5</td>
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<td>50.5</td>
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<td>100</td>
<td>1,500</td>
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<td>1</td>
<td>12</td>
<td>1,500</td>
<td>66.0</td>
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<td></td>
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<td>2,094.5</td>
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# 10 Year Cash Flow Analysis

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<th>YEAR</th>
<th>YEARLY SAVINGS</th>
<th>YEARLY COST</th>
<th>CUMULATIVE CASH FLOW</th>
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<tr>
<td>Year 1</td>
<td>$642.66</td>
<td>$795.22</td>
<td>-$152.56</td>
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<tr>
<td>Year 2</td>
<td>$642.66</td>
<td>$795.22</td>
<td>-$305.12</td>
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<td>Year 3</td>
<td>$642.66</td>
<td>$0.00</td>
<td>$337.55</td>
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<td>Year 4</td>
<td>$642.66</td>
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<td>Year 5</td>
<td>$642.66</td>
<td>$0.00</td>
<td>$1,622.87</td>
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<td>Year 6</td>
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<td>$2,265.53</td>
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<td>Year 7</td>
<td>$642.66</td>
<td>$0.00</td>
<td>$2,908.20</td>
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<tr>
<td>Year 8</td>
<td>$642.66</td>
<td>$0.00</td>
<td>$3,550.86</td>
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<td>Year 9</td>
<td>$642.66</td>
<td>$0.00</td>
<td>$4,193.52</td>
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<td>Year 10</td>
<td>$642.66</td>
<td>$0.00</td>
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<td>Totals</td>
<td>$6,426.62</td>
<td>$1,590.44</td>
<td>$4,836.18</td>
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## CUMULATIVE $$ Savings

![Graph showing cumulative savings over 10 years](image)
Project Benefits Summary

Reduce Energy Consumption  63%
Reduce Annual Utility Cost  $642.66
10 Year Positive Cash Flow  $4,836.18
Reduce Annual Maintenance Costs
Instant on / Instant off Lighting
Longer Life Lighting System
Improved Color Rendering
Disposal/Recycling of higher mercury lamps

Printed Name

Signature

Company Title

Date

Old Town Hall  10/9/2018
The JK Energy Solutions turnkey solution includes the recycling of your existing technology and the disposal of non-hazardous waste. Materials and workmanship of your newly upgraded measures are fully warranted as follows:

→ Workmanship – JK Energy Solutions 2 Year Warranty
→ Products - Manufacturer's Material Warranty

Your utility incentivized energy efficiency upgrade will result in a large reduction in operating costs for your facility. In addition, the new equipment will improve the quality of the overall working environment.

Customer signature of the proposal is authorization for JK Energy Solutions to proceed with construction. Customer agrees to promptly execute any documents required by Eversource to effect payment to JK Energy Solutions.

Project savings analysis is based on current burnt out lights being relamped prior to project installation.

This proposal is only guaranteed for 30 days from date of initial presentation.
Sandisfield – Library

23 Sandisfield Road, Sandisfield, MA

Nov 23, 2018

Efficiency Measures - Executive Summary

Executive Summary By:

Robert C. Boissonneault
JK Energy Solutions LLC
ENERGY RESOURCES LLC
(860) 391-7154
rboisssonneault@energyresourcesusa.net
A. **EXISTING CONDITIONS**

The building has older technology lighting and is lacking for insulation in the attic.

B. **High Efficiency Plan**

1. Install a new high efficiency lighting.
2. Install attic insulation.

Specifically:

1) **High Performance LED Lighting Upgrade**

The current interior lighting system consists of T12 fixtures as well as incandescent lamps. The exterior lighting is metal halide. We will upgrade these fixtures with energy efficient LED retrofit kits and LED PAR lamps. Exterior lighting will be new fixtures. This retrofit will result in reduced energy consumption as well as reduced maintenance costs due to the longer lamp life of LED vs the older technology. Lighting savings are expected to be 1225 kwh/year.

2) **Attic Insulation**

There is an opportunity to increase insulation levels from R-11 to R-49 by installing cellulose insulation to the attic floor. There is a total of 950 square feet in this area. Adding insulation to these areas will decrease drafty areas in the building. This will lead to reduced energy consumption and increased comfort in the building along with consistent temperatures throughout your building during the summer and winter.

Oil savings from these measures is expected to be 74 gallon per year.

Installation

- Complete mechanical and electrical installation, including necessary materials and labor for each item described above.

C. **NOT INCLUDED —**

* Anything not specifically noted above, is not included.
<table>
<thead>
<tr>
<th>BUILDING NAME</th>
<th>ECM</th>
<th>Project Annual Electricity Savings (kWh)</th>
<th>Project Annual Oil Savings (gallons)</th>
<th>Project Annual Savings ($)</th>
<th>Total Project Cost ($)</th>
<th>Utility Incentive ($)</th>
<th>Net Project Cost ($)</th>
<th>Simple Payback (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Library</td>
<td>Attic Insulation</td>
<td>74.19</td>
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<td>LED Lighting Upgrade</td>
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<td>$388.33</td>
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<td>$367.59</td>
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<tr>
<td>TOTAL</td>
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<td>1,225</td>
<td>74.19</td>
<td>$538.93</td>
<td>$6,044.72</td>
<td>$367.59</td>
<td>5,677.13</td>
<td>10.53</td>
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</table>

CUSTOMER ACKNOWLEDGEMENT

I have read and understand the outlined scope of work provided above, and agree that the focus of the project is energy savings. I understand that any savings stated above or within any Utility documents are estimated based upon a comparison of the baseline system to the high efficiency system, and using customer provided inputs for operating parameters.

Signature: __________________________
Name: __________________________
Title: __________________________
Date: __________________________

Initials: _________ Date_________
ADDENDUM: PICTURES FOR ATTIC INSULATION (SANDISFIELD - Library)
Comprehensive Energy Efficient Facility Upgrade

Developed by JK Energy Solutions for:

Sandisfield Library
23 Sandisfield Road, Sandisfield
Fred Ventresco
603-361-8448

JK Energy Consultant:
Darek Chomiak
413-376-8575
dchomiak@jkenergysolutions.net
Issued on: October 9, 2018
Expires on: November 8, 2018

JK Energy Solutions is an approved contractor for the Eversource MA Small Business DI Program
Project Savings Overview

**INPUT FACTORS:**
- kWh Rate: $0.317 / kWh
- Therms Rate
- Hours of Operation: Varies by Location
- Existing Measure Count: 37 measures
- Proposed Measure Count: 37 measures

**ENERGY and FINANCIAL SAVINGS:**
- Annual kWh Saved: 1,225 kWh
- Total Therms Saved
- Total Annual Savings ($): $388.42

**FACILITY INVESTMENT:**
- Turnkey Project Cost: $2,588.72
- Utility Incentive: $367.59
- MA Sales Tax*: $0.00
- **Net Total Investment**: $2,221.13

**FINANCIAL ANALYSIS:**
- Simple Payback (years): 5.72
- Project ROI: 17.49%
- Number of Months**: 24 months
- Monthly Payment: $92.55 / Monthly Savings: $32.37

Initials _______________    Date _______________

*Tax is calculated as 6.25% of retail materials cost only. **Interest-free financing will be provided off bill through Eversource MA. Customer has 30 days to act on this proposal.
## Detailed Energy Analysis

<table>
<thead>
<tr>
<th>ECM</th>
<th>Location</th>
<th>Existing System</th>
<th>Qty</th>
<th>Fixture Watts</th>
<th>Annual HRS</th>
<th>Replacement System</th>
<th>Qty</th>
<th>Fixture Watts</th>
<th>Annual HRS</th>
<th>Watts Saved</th>
<th>kWh Saved</th>
<th>Annual $ Savings</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Main Library</td>
<td>60W Incandescent Screw-in</td>
<td>15</td>
<td>60</td>
<td>600</td>
<td>14w ET17 Round Flush Mount LED</td>
<td>15</td>
<td>60</td>
<td>600</td>
<td>690.0</td>
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<td>2</td>
<td>Main Library</td>
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<td>8,760</td>
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<td>Closet</td>
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<td>60</td>
<td>75</td>
<td>14w ET17 Round Flush Mount LED</td>
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<td>75</td>
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<td>9.5</td>
<td>75</td>
<td>50.5</td>
<td>3.8</td>
<td>$ 1.20</td>
</tr>
<tr>
<td>7</td>
<td>Women's Room</td>
<td>60W Incandescent Screw-in</td>
<td>1</td>
<td>60</td>
<td>75</td>
<td>6.6W A19 LED</td>
<td>1</td>
<td>9.5</td>
<td>75</td>
<td>50.6</td>
<td>3.8</td>
<td>$ 1.20</td>
</tr>
<tr>
<td>8</td>
<td>Basement</td>
<td>Standard Exit Sign</td>
<td>1</td>
<td>15</td>
<td>8,760</td>
<td>LED Exit w/ Batt, Backup</td>
<td>1</td>
<td>2</td>
<td>8,760</td>
<td>13.0</td>
<td>113.9</td>
<td>$ 36.10</td>
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<tr>
<td>9</td>
<td>Basement</td>
<td>60W Incandescent Screw-in</td>
<td>1</td>
<td>60</td>
<td>500</td>
<td>14w ET17 Round Flush Mount LED</td>
<td>1</td>
<td>14</td>
<td>500</td>
<td>46.0</td>
<td>23.0</td>
<td>$ 7.29</td>
</tr>
<tr>
<td>10</td>
<td>Outside Back</td>
<td>150W MH Wallpack</td>
<td>1</td>
<td>190</td>
<td>500</td>
<td>Maxlite 26W Wallmax</td>
<td>1</td>
<td>29</td>
<td>500</td>
<td>161.0</td>
<td>80.5</td>
<td>$ 25.52</td>
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<tr>
<td>11</td>
<td>Outside Parking Side</td>
<td>100W Incandescent Screw-in</td>
<td>2</td>
<td>100</td>
<td>500</td>
<td>12W PAR 38 LED</td>
<td>2</td>
<td>12</td>
<td>500</td>
<td>176.0</td>
<td>88.0</td>
<td>$ 27.93</td>
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<tr>
<td>12</td>
<td>Outside Above Front Door</td>
<td>60W Incandescent Screw-in</td>
<td>2</td>
<td>60</td>
<td>500</td>
<td>9.5W A19 LED</td>
<td>2</td>
<td>9.5</td>
<td>500</td>
<td>101.0</td>
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<td>37</td>
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<td>37</td>
<td></td>
<td></td>
<td>1,777.5</td>
<td>1,225.3</td>
<td>$ 388.42</td>
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</table>
# 10 Year Cash Flow Analysis

<table>
<thead>
<tr>
<th>YEAR</th>
<th>YEARLY SAVINGS</th>
<th>YEARLY COST</th>
<th>CUMULATIVE CASH FLOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>$388.42</td>
<td>$1,110.57</td>
<td>-$722.14</td>
</tr>
<tr>
<td>Year 2</td>
<td>$388.42</td>
<td>$1,110.57</td>
<td>-$1,444.28</td>
</tr>
<tr>
<td>Year 3</td>
<td>$388.42</td>
<td>$0.00</td>
<td>-$1,055.86</td>
</tr>
<tr>
<td>Year 4</td>
<td>$388.42</td>
<td>$0.00</td>
<td>-$667.44</td>
</tr>
<tr>
<td>Year 5</td>
<td>$388.42</td>
<td>$0.00</td>
<td>-$279.01</td>
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<td>Year 6</td>
<td>$388.42</td>
<td>$0.00</td>
<td>$109.41</td>
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<td>Year 7</td>
<td>$388.42</td>
<td>$0.00</td>
<td>$497.83</td>
</tr>
<tr>
<td>Year 8</td>
<td>$388.42</td>
<td>$0.00</td>
<td>$886.26</td>
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<td>Year 9</td>
<td>$388.42</td>
<td>$0.00</td>
<td>$1,274.68</td>
</tr>
<tr>
<td>Year 10</td>
<td>$388.42</td>
<td>$0.00</td>
<td>$1,663.10</td>
</tr>
</tbody>
</table>

| Totals | $3,884.23 | $2,221.13 | $1,663.10 |

## CUMULATIVE $$ Savings

![Graph showing cumulative savings over 10 years.](image-url)
Project Benefits Summary

Reduce Energy Consumption  73%
Reduce Annual Utility Cost  $388.42
10 Year Positive Cash Flow  $1,663.10
Reduce Annual Maintenance Costs
Instant on / Instant off Lighting
Longer Life Lighting System
Improved Color Rendering
Disposal/Recycling of higher mercury lamps

Printed Name

Signature

Company Title

Date

Sandisfield Library 10/9/2018
The JK Energy Solutions turnkey solution includes the recycling of your existing technology and the disposal of non-hazardous waste. Materials and workmanship of your newly upgraded measures are fully warranted as follows:

- Workmanship – JK Energy Solutions 2 Year Warranty
- Products - Manufacturer’s Material Warranty

Your utility incentivized energy efficiency upgrade will result in a large reduction in operating costs for your facility. In addition, the new equipment will improve the quality of the overall working environment.

Customer signature of the proposal is authorization for JK Energy Solutions to proceed with construction. Customer agrees to promptly execute any documents required by Eversource to effect payment to JK Energy Solutions.

Project savings analysis is based on current burnt out lights being relamped prior to project installation.

This proposal is only guaranteed for 30 days from date of initial presentation.
Sandisfield - Firehouse

Sandisfield, MA

Nov 23, 2018

Efficiency Measures - Executive Summary

Executive Summary By:

Robert C. Boissonneault
JK Energy Solutions LLC
ENERGY RESOURCES LLC
(860) 391-7154
rboisssonneault@energyresourcesusa.net
A. **EXISTING CONDITIONS**

The building is lacking for insulation around hot water piping as well as building envelope.

B. **High Efficiency Plan**

1. Install pipe insulation on exposed hot water pipes.
2. Install attic insulation.

   Specifically:

   **1) Straight Pipe Insulation**

   There are many sections of hot water (180 degrees F) piping that are un-insulated. Please see list below.
   We will insulate with 1” thick pre-molded fiberglass pipe insulation with jacket and PVC fittings. Oil savings is expected to be 315 gallons per year
   1-1/4” pipe - 500’
   1-1/4” 90 Elbows - 60

   **2) Attic and Crawlspace Insulation**

   There is an opportunity to increase insulation levels from R18 to R-49 by adding cellulose insulation to the attic floor. There is a total of 836 square feet in this area. Adding insulation to these areas will decrease drafty areas in the building. This will lead to reduced energy consumption and increased comfort in the building along with consistent temperatures throughout your building during the summer and winter.
   Oil savings from these measures is expected to be 30 gallon per year.

   **Installation**

   - Complete mechanical installation, including necessary materials and labor for each item described above.

C. **NOT INCLUDED –**

* Anything not specifically noted above, is not included.
<table>
<thead>
<tr>
<th>BUILDING NAME</th>
<th>ECM</th>
<th>Project Annual Electricity Savings (kWh)</th>
<th>Project Annual Oil Savings (gallons)</th>
<th>Project Annual Savings ($)</th>
<th>Total Project Cost ($)</th>
<th>Utility Incentive ($)</th>
<th>Net Project Cost ($)</th>
<th>Simple Payback (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire House</td>
<td>Attic Insulation</td>
<td>29.97</td>
<td>$61.14</td>
<td>$3,215.00</td>
<td>$3,215.00</td>
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<tr>
<td></td>
<td>Straight Pipe Insulation on HW Supply - 1/4&quot;</td>
<td>315.32</td>
<td>$643.25</td>
<td>$10,133.00</td>
<td>$10,133.00</td>
<td>-</td>
<td>$10,133.00</td>
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<td>-</td>
<td>345.29</td>
<td>$704.39</td>
<td>$13,348.00</td>
<td>$13,348.00</td>
<td>-</td>
<td>$13,348.00</td>
<td>18.05</td>
</tr>
</tbody>
</table>

**CUSTOMER ACKNOWLEDGEMENT**

I have read and understand the outlined scope of work provided above, and agree that the focus of the project is energy savings. I understand that any savings stated above or within any Utility documents are estimated based upon a comparison of the baseline system to the high efficiency system, and using customer provided inputs for operating parameters.

Signature: __________________________

Name: ______________________________

Title: ______________________________

Date: ______________________________

Initials: _______ Date_______
ADDENDUM: PICTURES OF UN-INSULATED PIPING (SANDISFIELD FIREHOUSE)
<table>
<thead>
<tr>
<th>BUILDING NAME</th>
<th>ECM</th>
<th>Project Annual Electricity Savings (kWh)</th>
<th>Project Annual Oil Savings (gallons)</th>
<th>Project Annual Savings ($)</th>
<th>Total Project Cost ($)</th>
<th>Utility Incentive ($)</th>
<th>Net Project Cost ($)</th>
<th>Simple Payback (years)</th>
<th>MMBtu</th>
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</thead>
<tbody>
<tr>
<td>Annex</td>
<td>Attic Insulation</td>
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<td>$676.40</td>
<td>$9,004.00</td>
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<td>-</td>
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<td>13.31</td>
<td>46.1</td>
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<tr>
<td>Straight Pipe Insulation on HW Supply - 1&quot;, 1-1/4&quot;, 2-1/2&quot;</td>
<td>514</td>
<td>$1,048.56</td>
<td>$12,820.00</td>
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<td>-</td>
<td>$2,909.57</td>
<td>2.16</td>
<td>20.1</td>
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<td><strong>TOTAL</strong></td>
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<td><strong>5,900</strong></td>
<td><strong>845.57</strong></td>
<td><strong>$3,070.16</strong></td>
<td><strong>$26,503.50</strong></td>
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<td><strong>8.06</strong></td>
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<tr>
<td>Old Town Hall</td>
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<td>-</td>
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<td>11.9</td>
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<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>3,474</strong></td>
<td><strong>24.63</strong></td>
<td><strong>$692.69</strong></td>
<td><strong>$6,537.60</strong></td>
<td><strong>$1,042.16</strong></td>
<td><strong>$5,495.44</strong></td>
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<td>Library</td>
<td>Attic Insulation</td>
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<td>$3,456.00</td>
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<td>4.2</td>
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<tr>
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<td>$2,588.72</td>
<td>$367.59</td>
<td>$2,221.13</td>
<td>-</td>
<td>$2,221.13</td>
<td>5.72</td>
<td>4.2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>1,225</strong></td>
<td><strong>74.19</strong></td>
<td><strong>$538.93</strong></td>
<td><strong>$6,044.72</strong></td>
<td><strong>$367.59</strong></td>
<td><strong>$5,677.13</strong></td>
<td><strong>10.53</strong></td>
<td></td>
</tr>
</tbody>
</table>

\[E= 0.003412 \text{ MMBtu}\]
\[Oil= 0.139 \text{ MMBtu}\]
\[Propane= 0.091 \text{ MMBtu}\]

\[\text{TOTAL MMBTUs} = 153.7\]
We did not design and price every imaginable scenario. We only put together practical solutions to the obvious need that we saw and discussed during our walk-through audits. I will try to answer each of your questions in order:

1.) The sub-contractor that we brought in for weatherization addressed insulation and air air sealing in the areas that made sense. My team will have the details on what they included on each building. They did not get to the level of detail for including door sweeps and window caulking. Each building had a different practical need, and I am sure that attic insulation was included.

2.) If the furnace and/or boiler has more than 2 years of life left in it, we do not recommend replacing it. In many cases the payback period is about the same as the life expectancy. Nobody would replace a 30 year boiler, if it has a 30 year payback... unless you had no choice. Once a customer tells us that the boiler is at end of life and needs to be replaced within 12 - 24 months, that's when we will recommend a high efficiency replacement.

3.) There are soooooo many different types of scenarios for heating, cooling, ventilating and providing energy to a building. Combining renewable energy like Solar PV, Wind etc... is always an option coupled with high efficiency electric equipment (geothermal heat pumps, air source heat pumps, electric boilers, high efficiency chillers...etc...) and/or utilizing combined heat and power options (Fuel Cells, Engine driven generators with waste heat recapture, steam boilers with absorption chillers...). The Combinations are exhausting. As a contractor, we are only going to look at practical one-for-one direct changeouts that fit the Utility Program we are working in. We just don't have the staff or time to evaluate all the endless possibilities.

4.) Yes.. We do indoor and outdoor LED light conversions every day of the week. This is part of our everyday business. I would have to defer back to our lighting division to we exactly what they proposed on each of the buildings that were audited.

5.) Yes. We have performed thousands and thousands of pole light conversions on private property, and I know we have been involved in designs and proposals for entire town street light changes. Again - I would defer back to our lighting division to see if we have installed any complete town street lights... or if we have just designed/priced.

I hope this helps for a quick response.

Rob

---

**Rob Boissonneault**  
President - Mechanical Contracting  
Energy Resources (parent company to BTU Solutions LLC & JK Energy Solutions LLC)  
76 Watertown Road, Suite 2A  
Thomaston, CT  06787
On Sun, Oct 21, 2018 at 3:41 PM Lauren Gaherty <Lgaherty@berkshireplanning.org> wrote:

Hello Rob –

Thank you so much for forwarding the information to us. I have a couple of questions:

1. Did your staff look at air leaks – windows, doors, attic, etc? Does your company do this? If so, what energy savings might the town anticipate from that work?
2. I see no recommendations for upgrades to heating systems. Were the furnaces or boilers already energy efficient?
3. What about new ground or air source heat pumps? The state seems to be pushing them. Especially if they’re bundled with solar installations to offset the possible electricity increases from the running of the pumps.
4. Does the LED lighting include outside lights?
5. Does your company help towns swap out the streetlights to LEDs?

I’d welcome your thoughts as we try to help the town draft a strategy to reduce energy use by 20%

Thanks,

Lauren Gaherty, Senior Planner
Berkshire Regional Planning Commission
1 Fenn Street, Suite 201
Pittsfield, MA 01201
Mon. – Thurs. 8:00 – 5:30
(P) 413-442-1521, ext. 35
(F) 413-442-1523

The Secretary of the Commonwealth has determined that most e-mails to and from public offices are public records. Consequently, confidentiality should not be expected.
Lauren and Fred:

In an effort to meet some quick deadlines, we have attached the SUMMARY spreadsheet for Sandisfield.

thanks,

Rob

---

Rob Boissonneault

President - Mechanical Contracting

Energy Resources (parent company to BTU Solutions LLC & JK Energy Solutions LLC)

76 Watertown Road, Suite 2A

Thomaston, CT 06787

HVAC License #397605-S1

(860) 391-7154 cell
Lauren,
Please see below and see attached.

Darek Chomiak

**Director of Sales**
**JK Energy Solutions**
Authorized Eversource, UI and NGRID CDO Contractor
dchomiak@energyresourcesusa.net
www.energyresourcesusa.net

(c) 203-617-9622
(c) 413-376-8575
(f) 860-880-8304

Sent from my iPhone

Begin forwarded message:

**From:** Morgan Kennedy <mkenney@energyresourcesusa.net>
**Date:** October 25, 2018 at 5:16:49 PM EDT
**To:** Darek Chomiak <dchomiak@energyresourcesusa.net>, Keith Sleeper <ksleeper@energyresourcesusa.net>, Kyle Keindl <kkeindl@energyresourcesusa.net>
**Subject:** Solar - Town of Sandisfield

All,

Attached is a solar proposal for the town of Sandisfield. This project is cashflow positive.

Darek, the other two bills do not qualify for solar, as no net metering is available. Because of this, the streetlights meter, which does not have an address, is not somewhere we can serve it, and the 3 silverbrook rd site has no summertime consumption, which represents 2/3 of the solar production.

I've provided a PPA and purchase option. The PPA is contingent on incentives from SMART, and as such if they do not act on it and the incentives dry up, it will need to be adjusted.

Thanks,

Morgan Kennedy

Energy Resources
603-731-2035

http://energyresourcesusa.net
Information provided by Allan Ferry, BETNR about the new highway garage

**Lighting:**
- T-12 8' long fluorescent tubes vs LED lighting
  - Testing proves LED performs over 50% better

**Overhead Doors:**
- R-1.4 vs R-12.76 = 90% better

**Building Envelope:**
- Roof: Maybe R-2 with wood shingles vs R-38
  = over 90% better

**Heating System:**
- Oil burning ceiling mounted unit heater vs high efficiency propane fired boiler (95% efficient)
  - If unit heater was 80% efficient (this is saying a lot), the new one is 15-20% more efficient
  - Forced hot air vs radiant heat in the slab
    - Ceiling mounted unit heaters blow hot air down. The heat then rises and leaves the floor space cool.
    - Radiant in the slab heats from the floor up. The slab stays warm continuously accounting for lower heating bills, up to 50% less than forced hot air per year

Notes from phone conversation with A. Ferry, 10-25-18:
An overall conservative estimate is that the new garage will use 50% of the heating fuel and electricity of the old building.
A Family of Condensing Boilers

✓ Superior energy savings
✓ Quality construction
✓ Variety of configurations
✓ Energy-saving standard features

■ FOUR great options!
U.S. Boiler Company offers the NEW K2 Firetube, the original K2, the Alpine, and the value-priced X-C boiler. These four condensing boiler models offer an incredibly comprehensive array of sizes and capabilities that are UNMATCHED in the home heating industry. Unsure of which boiler to choose? Simply ask your home heating professional; they will eliminate the guesswork and help you find the best model to fit your needs.

■ A Month of FREE HEAT?
Yes, it may seem unbelievable, but upgrading from a typical 80% efficient boiler to any of U.S. Boiler’s condensing boilers can provide about a 15-20% savings in energy, which can equate to a month (or more) of heating fuel costs. What this means to homeowners is that energy savings can be realized during the first year of operation, and EVERY YEAR THEREAFTER.

■ Good for you and the environment
High efficiency home heating benefits you by providing home heating comfort with lower fuel consumption. It also means less emissions, which benefits everyone!

■ Extras INCLUDED
All of these boilers come packed with standard energy saving features, one of which is ‘Outdoor Reset’. By reading input from a sensor located outside the house, these boilers are able to determine what the correct output should be in order to match the heating requirement of the temperature outside. This feature is very useful in the “fringe” seasons of fall and spring, when the temperature outside can fluctuate greatly.
LIGHTING: ORIGINAL BLDG: 8' FLUORESCENT T-12 STRIPS
NEW BLDG: (8) 135-WATT LED HIGH BAY INTERIOR
(4) 78-WATT LED EXTERIOR LIGHTS
LED LIGHTS ARE OVER 50% MORE EFFICIENT THAN
FLUORESCENT TUBES.

OVERHEAD DOORS: ORIGINAL BUILDING HAD (3) WOODEN DOORS
R-VALUE FOR A 1" THICK WOOD DOOR IS
APPROXIMATELY 1.4
NEW BUILDING HAS (4) OVERHEAD DOORS. THESE
DOORS HAVE METAL SKINS FILLED WITH POLYURETHANE
INSULATION. THE R-VALUE IS 12.76. THERE
ARE WEATHER SEALS ON ALL EDGES TO PREVENT
AIR INFILTRATION
THESE DOORS PERFORM GREATER THAN 90%
BEETR THAN THE WOOD DOORS

BUILDING INSULATION:
ORIGINAL BLDG: BLOCK WALLS R-1.28 TYPICAL
WOOD ROOF: NO INSULATION
NEW BUILDING: R-25 FULL CAVITY INSULATION
WTH CONTINUOUS VAPOR BARRIER
ROOF: R-38 8" FULL CAVITY INSULATION
WITH 4" OVER THE TOP OF THE 8"
CONTINUOUS VAPOR BARRIER