**6/2011**

**US EPA Region 1**

**Municipal Energy Management Plan Workbook**

This workbook contains tools that have been found to be effective in helping towns and local energy committees to develop energy plans and use the Plan-Do –Check –Act model to reduce energy use. The main product is the energy inventory, once that is completed and presented these tools can be used in a group setting to help encourage discussion and set direction of the local energy committee and interested town officials, hopefully working together.

**Plan**

**Steps:**

**1) Worksheet of Previously Implemented Energy Improvement Projects**

Every town has done some energy efficiency projects. It might have been lighting, replacement of HVAC, streetlights, or other projects with rebates from the electrical utility. It might have been benchmarking by a student or consultant. Town Managers wearing too many hats cannot keep track of everything that has been done, and membership of the Local Energy Committee often changes, or the volunteers making up the committee do not meet on a consistent basis, so information easily gets lost. These projects need to be documented so the town knows where to begin with their energy plan and the results of past efforts are not lost. The location of existing documentation and things such as passwords to Portfolio Manager should also be documented here. (See attached worksheet)

**2) Assessment Tool**

The intent of the municipal assessment tool is to:

-help explain what an energy management plan is

-measure progress being made by a town in developing an energy management plan

-provide a graphic presentation of where efforts should be made if the town wants to develop a robust energy management plan.

The assessment tool can be filled out when beginning to work with a town or energy committee so they understand the goals of developing an energy management plan. It can then be filled out again in the future to demonstrate progress being made. (See separate file)

**3) Data Collection Worksheets**

Data needs to be collected to be entered into STOCC and Portfolio Manager to develop an energy inventory. These tools will give the town a baseline to use in making the decision for next steps. The data should be entered for a period of time decided upon by the town, but not less than 12 months. The data for each type of energy use must be completely overlapping. The data must include all sources of energy used by the town. STOCC can automatically make nice graphs; Portfolio Manager Data must be down loaded into Excel. The presentation of data should be kept simple and focus on where energy is being used. The next steps include auditing the buildings or fleets that use the most energy. (See examples of presentations). It may be easier to start with benchmarking one or two buildings, so that the task of data collection does not get overwhelming. (See attached worksheets) <http://www.cleanair-coolplanet.org/for_communities/stocc.php>

<http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager>

**4) Develop Comprehensive Inventory Report : Written and Power Point Presentation**

A comprehensive inventory report should include all sources and uses of energy in the town including heat and electricity for municipal buildings, energy use for fleets, and streetlights and traffic lights. Examples including boilerplate language to develop a report are available on the Nashua Regional Planning Commission website. The comprehensive inventory report must be presented to all decision makers including town officials and energy committee members. The Power point presentation should be brief and to the point, the decision makers need to know where energy is being used, and how the energy intensity of their buildings compares to the national average. <http://www.nashuarpc.org/publications/local/Hollis/Hollis_Energy_Report.pdf>

**Do**

**Steps:**

**1) Audit Municipal Buildings**

1. Do your own walk through audits to find obvious problems. Schedule free audits with utility companies. The utility companies offer free audits too their municipal customers, Often these audits can suggest areas where more expertise should be brought in the future. [Z:\Data\wwt\muni guide documents\How to Conduct Your Own Energy Audit - Nicor.mht](file:///Z:\Data\wwt\muni%20guide%20documents\How%20to%20Conduct%20Your%20Own%20Energy%20Audit%20-%20Nicor.mht)

**2) Develop list of projects**

Based on the inventory and audits, develop a list of potential energy reduction projects, including behavioral programs and areas that need more research, or more comprehensive audits.

**3) Complete Energy Priority Ranking Table**

Once the town has completed benchmarking and auditing, they should have a number of potential projects. This tool is very helpful in ranking the projects. Some recommendations may be big energy savers, but may not be feasible to do at this time. Using this table will keep the energy plan moving ahead even if funding is lacking or the committee is not willing to go to town meeting for big ticket items at this time. It also serves to document the recommendations and can be revisited if grants or other funding become available. This should be done as a group exercise with the energy committee and town management so all opinions are heard and discussed.

**4) Energy Action Plan**

Each action from the energy priority ranking table that the town or energy committee decides to undertake should have an action plan written for it. This provides documentation that can be pulled out and reviewed at each meeting. If dates, personnel and timelines shift as the project progresses, that information should be documented on the action plan so information is not lost. Projects, especially when being done by volunteers, rarely proceed as planned, so it is important that any progress is documented.

**Check**

**Steps :**

**1) Update data collection with data collection worksheet from STOCC and Portfolio Manager**

Update data after a significant project is completed or on a monthly or annual basis to track progress

**2) Update Assessment tool**

Revisit energy management planning assessment spreadsheet and update with any progress that has been made**.**

**ACT**

**Steps:**

**1) Develop Presentation on Progress Made**

Using updated data, redo presentation and present to town officials and energy committee members

**2) Advertise Progress**

Publish article on progress in local newspaper, on line, any venue to get the information to the public on both energy savings and dollar savings.

**3) Go Back to PLAN**

**Appendix**

1. Worksheet on previously implemented projects (Attached)
2. Assessment tool (See separate File)
3. STOCC and PM Data collection worksheets (Attached)
4. Boilerplate inventory report from Hollis, [NHhttp://www.nashuarpc.org/publications/local/Hollis/Hollis\_Energy\_Report.pdf](http://www.nashuarpc.org/publications/local/Hollis/Hollis_Energy_Report.pdf)
5. Example power point presentations (see separate File)
6. Energy priority ranking table worksheet (Attached)
7. Energy Action plan Worksheet (Attached)
8. How to conduct your own Energy Audit [Z:\Data\wwt\muni guide documents\How to Conduct Your Own Energy Audit - Nicor.mht](file:///Z:\Data\wwt\muni%20guide%20documents\How%20to%20Conduct%20Your%20Own%20Energy%20Audit%20-%20Nicor.mht)

**Worksheet of Previously Implemented Energy Improvement Projects: Use this to identify energy improvements Town has already made**

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| --- | --- | --- | --- | --- |
| **Energy Use *[****type]* | **Completed Projects or Programs** | **Results** *($$, gallons, kWh, normalized if possible)* | **Who were results communicated to?** | **Were there associated SOPs, training records?** |
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Adapted from *Ensuring a Sustainable Future: An Energy Management Guidebook for Wastewater and Water Utilities,* EPA, January 2008, p. 16



**Data Required for the Small Town Carbon Calculator (STOCC)**

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| --- | --- | --- |
| **Buildings & Facilities** | | |
| **Information** | **Where you may find it** | **☑** |
| Building name | Building manifests/tax forms, town offices, town administrator, town clerk, or selectperson. May be on town website |  |
| Annual electricity (KWH) used | Sum monthly totals from the electricity bills to calculate annual KWH used. Data can be found at: town archives/offices/administrator. May need to contact provider company to get copies of old bills |  |
| Annual cost of electricity | Sum monthly totals from the electricity bills to calculate annual cost. Enter total cost of bill which includes fees |  |
| Annual units of other fuel used (oil, gas, etc.) | Oil bills, natural gas bills, etc. Sum all bills from one year to calculate annual amount delivered |  |
| Annual cost of other fuel | Sum all the oil bills, natural gas bills, etc. to calculate annual costs. |  |

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| --- | --- | --- | --- | --- |
| **Vehicles** | | | | |
| **Information** | **Where you may find it** | | **☑** | |
| Vehicle name/Number | Highway garage manager or town administrator. There may be a vehicle manifest for the town. May need to contact fire and police departments separately. | |  | |
| Amount of fuel used per vehicle | Find out if records were kept from vehicle fill-ups. If it is broken down by type of fuel (diesel, regular, etc), capture that information. Sum all fuel by vehicle to calculate annual total | |  | |
| Annual cost of fuel per vehicle | Sum all vehicle fill-up records to calculate annual costs | |  | |
| \*\*If you do not have the annual amount/cost of fuel per vehicle, it can instead be calculated using following information \*\* | | | | |
| Average cost per unit of fuel | For New England, the average cost of regular unleaded gasoline has been: $2.59 (2006), $2.82 (2007), and $3.89 (2008). More info at: www.eia.doe.gov | |  | |
| Miles travelled per vehicle | Odometer readings: town records, vehicle inspection records, vehicle registration records | |  | |
| MPG for each vehicle | Owner’s manual or online from: http://www.fueleconomy.gov/mpg/MPG.do?action=browseList | |  | |
|  |  | |  | |
| **Streetlights** | | | |
| **Information** | **Where you may find it** | **☑** | |
| Number of streetlights | Bill from electricity provider: in town archives or get copies from electricity provider. If the bill does not specify the number of streetlights, ask town administrator or secretary how to get the number. |  | |
| Annual electricity (KWH) used | Sum monthly totals from the electricity bills to calculate annual totals. Data found at: town archives/offices/administrator. May need to contact provider company to get copies of old bills |  | |
| Annual cost of electricity used | Sum monthly totals from the electricity bills to calculate annual totals. Enter total cost of bill which includes fees |  | |

**ENERGY STAR Portfolio Manager Data Collection Worksheet**

This worksheet was designed to help building owners and managers collect data to benchmark buildings using EPA ENERGY STAR’s Portfolio Manager. The information in this worksheet will be used to establish your building’s profile in Portfolio Manager, which is critical to calculate benchmarks of key metrics such as energy intensity and costs, water use, and carbon emissions. **All building types can be entered into Portfolio Manager and receive energy and water benchmarks, as well as a comparison of performance against a national average for buildings of a similar type.**

Some buildings will also receive an ENERGY STAR rating. The ENERGY STAR rating is a benchmark that indicates how efficiently buildings use energy on a 1-100 scale. A rating of 50 indicates that energy performance is average compared to similar buildings, while a rating of 75 or better indicates top performance, and means your building may be eligible to earn the ENERGY STAR label. To receive an ENERGY STAR rating, the gross floor area of the building must be comprised of 50% or more of one of the following space types:

* [Bank/Financial Institution](http://www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_space_types#bank)
* [Courthouse](http://www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_space_types#courthouse)
* [Hospital (acute care and children’s)](http://www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_space_types#hospital)
* [Hotel](http://www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_space_types#hotel)
* [K-12 School](http://www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_space_types#k-12)
* [Medical Office](http://www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_space_types#medical_office)
* [Multifamily Housing](http://www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_space_types#hotel)
* [Office](http://www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_space_types#office)
* [Residence Hall/Dormitory](http://www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_space_types#dorm)
* [Retail Store](http://www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_space_types#retail)
* [Supermarket](http://www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_space_types#supermarket)
* [Warehouse (refrigerated and non-refrigerated)](http://www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_space_types#warehouse)
* [Wastewater Treatment Plant](http://www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_space_types#wastewater)

Click on the space type to view a definition and a summary of the information needed to receive an ENERGY STAR rating. If you have a building with space types not listed above, enter this space into Portfolio Managerusing the “Other” space type.

**Required Data for ENERGY STAR Benchmarking**

* Portfolio Manager username and password.
* The building street address, year built, and contact information.
* The building gross floor area and key operating characteristics for each major space type. Use this worksheet to collect this information before logging in to Portfolio Manager.
* 12 consecutive months of utility bills for all fuel types used in the building. If you don’t have this information readily available, contact your utility provider(s) as most will be able to easily supply this historical information.

**General Building Information**

Facility name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Year built\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Building address \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

City \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ State \_\_\_\_\_\_\_\_\_\_\_\_ZIP \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Space Use Attributes**

Before compiling the information noted in the boxes below, review the following important information:

* Specific definitions and instructions for each of the data fields listed in the boxes below can be viewed by navigating to the [Portfolio Manager Help](https://www.energystar.gov/istar/pmpam/help/portfolio_manager_online_help.htm), selecting “Space Type Definitions,” choosing the appropriate building type, and selecting “Space Use Information.”
* Some buildings may contain multiple space types within a single building (e.g. office, computer data center, and parking OR K-12 school and swimming pool). Complete the fields below for each applicable major space types within the building.
* For buildings with multiple tenants with the same space type, these spaces should be entered separately only when the number of weekly operating hours among tenants differs by more than 10 hours. For example, in a 100,000 square foot (SF) office building where 75,000 SF operates 60 hours a week and 25,000 SF operates 80 hours a week, please list as two separate spaces – one 75,000 SF space and one 25,000 SF space. As this is most common in office buildings, multiple office space fields are provided below to capture data for multiple tenants if necessary.
* Default values supplied by Portfolio Manager can be used for all space use characteristics with the exception of gross floor area. Using default values will result in an approximate energy performance rating which can be a beneficial metric for estimating energy performance. If defaults are used for an initial rating, it is recommended that actual data be added later to more accurately measure a facility’s energy performance. Facilities using default values are not eligible to apply for the ENERGY STAR label. Leave any of the requested information below blank (except gross floor area) to use a default value for the field.

|  |  |
| --- | --- |
| **General office 1:**  \_\_\_\_\_\_\_ **gross floor area (SF)**  \_\_\_\_\_\_\_ weekly operating hours  \_\_\_\_\_\_\_ # of workers on main shift  \_\_\_\_\_\_\_ # of personal computers  \_\_\_\_\_\_\_ Percent of floor area that is air conditioned (>50%, <50%, or none)  \_\_\_\_\_\_\_ Percent of floor area that is heated (>50%, <50%, or none) | **Medical office space:**  \_\_\_\_\_\_\_ **gross floor area (SF)**  \_\_\_\_\_\_\_ # of workers on main shift  \_\_\_\_\_\_\_ weekly operating hours |
| **General office 2:**  \_\_\_\_\_\_\_ **gross floor area (SF)**  \_\_\_\_\_\_\_ weekly operating hours  \_\_\_\_\_\_\_ # of workers on main shift  \_\_\_\_\_\_\_ # of personal computers  \_\_\_\_\_\_\_ Percent of floor area that is air conditioned (>50%, <50%, or none)  \_\_\_\_\_\_\_ Percent of floor area that is heated (>50%, <50%, or none) | **Hospital** (Acute Care and Children’s)  \_\_\_\_\_\_\_ **gross floor area** (>20,000 SF)  \_\_\_\_\_\_\_ # of licensed beds  \_\_\_\_\_\_\_ # of floors  \_\_\_\_\_\_\_ tertiary care facility – yes or no |
| **General office 3:**  \_\_\_\_\_\_\_ **gross floor area (SF)**  \_\_\_\_\_\_\_ weekly operating hours  \_\_\_\_\_\_\_ # of workers on main shift  \_\_\_\_\_\_\_ # of personal computers  \_\_\_\_\_\_\_ Percent of floor area that is air conditioned (>50%, <50%, or none)  \_\_\_\_\_\_\_ Percent of floor area that is heated (>50%, <50%, or none) | **K-12 school:**  **\_\_\_\_\_\_\_ gross floor area (SF)**  \_\_\_\_\_\_\_ # of personal computers  \_\_\_\_\_\_\_ # of walk-in refrigeration/freezer units  **\_\_\_\_\_\_\_** high school - yes or no  \_\_\_\_\_\_\_ open weekends – yes or no  \_\_\_\_\_\_\_ on-site cooking – yes or no  \_\_\_\_\_\_\_ Percent of floor area that is cooled in 10% increments (10%, 20%, 30%, etc.)  \_\_\_\_\_\_\_ Percent of floor area that is heated in 10% increments (10%, 20%, 30%, etc.) |
| **Bank/Financial Institution:**  \_\_\_\_\_\_\_ **gross floor area (SF)**  \_\_\_\_\_\_\_ weekly operating hours  \_\_\_\_\_\_\_ # of workers on main shift  \_\_\_\_\_\_\_ # of personal computers  \_\_\_\_\_\_\_ Percent of floor area that is air conditioned (>50%, <50%, or none)  \_\_\_\_\_\_\_ Percent of floor area that is heated (>50%, <50%, or none) | **Hotel:**  \_\_\_\_\_\_\_ **gross floor area (SF)**  \_\_\_\_\_\_\_ # of rooms  \_\_\_\_\_\_\_ # of workers on main shift  \_\_\_\_\_\_\_ # of commercial refrigeration/freezer units  (walk-in, open, and closed cases)  \_\_\_\_\_\_\_ on-site cooking – yes or no  \_\_\_\_\_\_\_ Percent of floor area that is cooled in 10% increments (10%, 20%, 30%, etc.)  \_\_\_\_\_\_\_ Percent of floor area that is heated in 10% increments (10%, 20%, 30%, etc.) |
| **Courthouse:**  \_\_\_\_\_\_\_ **gross floor area (SF)**  \_\_\_\_\_\_\_ weekly operating hours  \_\_\_\_\_\_\_ # of workers on main shift  \_\_\_\_\_\_\_ # of personal computers  \_\_\_\_\_\_\_ Percent of floor area that is air conditioned (>50%, <50%, or none)  \_\_\_\_\_\_\_ Percent of floor area that is heated (>50%, <50%, or none) | **Retail Store:**  \_\_\_\_\_\_\_ **gross floor area (SF)**  \_\_\_\_\_\_\_ weekly operating hours  \_\_\_\_\_\_\_ # of workers on main shift  \_\_\_\_\_\_\_ # of personal computers  \_\_\_\_\_\_\_ # of cash registers  \_\_\_\_\_\_\_ # of walk-in refrigeration/freezer units  \_\_\_\_\_\_\_ # of open & closed refrigeration/freezer cases  \_\_\_\_\_\_\_ Percent of floor area that is cooled in 10% increments (10%, 20%, 30%, etc.)  \_\_\_\_\_\_\_ Percent of floor area that is heated in 10% increments (10%, 20%, 30%, etc.) |
| **Grocery/Supermarket stores:**  **\_\_\_\_\_\_\_ gross floor area** **(SF)**  \_\_\_\_\_\_\_ weekly operating hours  \_\_\_\_\_\_\_ workers on main shift  \_\_\_\_\_\_\_ on-site cooking – yes or no  \_\_\_\_\_\_\_ # of walk-in refrigeration/freezer units  \_\_\_\_\_\_\_ Percent of floor area that is cooled in 10% increments (10%, 20%, 30%, etc.)  \_\_\_\_\_\_\_ Percent of floor area that is heated in 10% increments (10%, 20%, 30%, etc.) | **Computer Data Center:**  \_\_\_\_\_\_\_ **gross floor area (SF)** (must be less than 10% of gross building floor area in order for the building to be eligible for a rating)  \_\_\_\_\_\_\_ weekly operating hours |
| **Dormitory/Residence hall:**  \_\_\_\_\_\_\_ **gross floor area (SF)**  \_\_\_\_\_\_\_ # of rooms | **Parking:**  \_\_\_\_\_\_\_ gross floor area that is enclosed (SF)  \_\_\_\_\_\_\_ gross floor area that is unenclosed with a roof (SF)  \_\_\_\_\_\_\_ gross floor area that is open (SF)  \_\_\_\_\_\_\_ weekly hours of access |
| **Warehouse (Refrigerated or Unrefrigerated):**  \_\_\_\_\_\_\_ **gross floor area (SF)**  \_\_\_\_\_\_\_ refrigerated or unrefrigerated  \_\_\_\_\_\_\_ weekly operating hours  \_\_\_\_\_\_\_ # of workers on main shift  \_\_\_\_\_\_\_ # of walk-in coolers and refrigerators  \_\_\_\_\_\_\_ Percent of floor area that is cooled in 10% increments (10%, 20%, 30%, etc.)  \_\_\_\_\_\_\_ Percent of floor area that is heated in 10% increments (10%, 20%, 30%, etc.)  \_\_\_\_\_\_\_ High-intensity discharge (HID) or halogen lighting systems that primarily light the facility – yes or no | **Swimming Pool:**  \_\_\_\_\_\_\_\_\_\_ swimming pool size, choose from:  Olympic 1 (50 meters x 25 meters)  Olympic 2 (50 meters x 25 yards)  Recreational (20 yards x 15 yards)  Short Course (25 yards x 20 yards)  \_\_\_\_\_\_\_\_\_\_ indoor or outdoor |
| **Wastewater Treatment Plant:**  \_\_\_\_\_\_\_ average influent flow (mgd)  \_\_\_\_\_\_\_ average influent biological oxygen demand (BOD5)  \_\_\_\_\_\_\_ average effluent biological oxygen demand (BOD5)  \_\_\_\_\_\_\_ plant design flow rate (mgd)  \_\_\_\_\_\_\_ presence of fixed film trickle filtration process – yes or no  \_\_\_\_\_\_\_ presence of nutrient removal process – yes or no | **Multifamily Housing:**  ***Note: Only gross floor area is required but it is recommended that all information be entered into Portfolio Manager to allow for the development of comparative metrics for the industry.***  \_\_\_\_\_\_\_ **gross floor area (SF) *(Required)***  \_\_\_\_\_\_\_ number of units  \_\_\_\_\_\_\_ number of bedrooms  \_\_\_\_\_\_\_ number of floors  \_\_\_\_\_\_\_ percent of square footage devoted to individual units  \_\_\_\_\_\_\_ number of laundry hookups in each unit  \_\_\_\_\_\_\_ number of laundry hookups in common area  \_\_\_\_\_\_\_ number of dishwashers in each unit  \_\_\_\_\_\_\_ Percent of floor area that is cooled in 10% increments (10%, 20%, 30%, etc.)  \_\_\_\_\_\_\_ Percent of floor area that is heated in 10% increments (10%, 20%, 30%, etc.)  \_\_\_\_\_\_\_ affordable or market rate |
| **Other:**  \_\_\_\_\_\_\_ **gross floor area (SF)** (must be less than 10% of gross building floor area in order for the building to be eligible for a rating) |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Audit Recommend-ation** | **Operation or**  **Location** | **Type of Energy**  **Used** | **Current Costs** | **Ranking Criteria to Set Priorities**  **(Examples Only)** | | | | | | | |
|  |  |  |  | **Projected Costs to Improve**  1= H  3= M  5= L | **Feasibility of Energy Efficiency Projects**  1= not feasible  3= feasible  5= Very feasible | **Feasibility of Alternative, Renewable sources?**  1= L  3= M  5= H | **Costs to implement**  1= H  3= M  5= L | **Availability of Funding**  1=Capital funds required  3=potential or not known  5=Funding options available | **Rate of Return on Investment**  1= More than\_\_\_ years  3= \_\_\_ years  5= Less than\_\_\_\_ years | **Regulated?**  0=No  3=Yes  5=Yes and compliance issues exist | **Total**  **Score** |
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Energy Management Plan

Action Plan for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| --- | --- | --- | --- | --- |
| **Task** | **Staff** | **Timeline** | **Estimated Time**  **(Person Hours or FTE)** | **Estimated Costs**  **(e.g.,equipment)** |
| Task:  Deliverable: |  |  |  |  |
| Task:  Deliverable: |  |  |  |  |
| Task:  Deliverable: |  |  |  |  |
| Task:  Deliverable: |  |  |  |  |
| Task:  Deliverable: |  |  |  |  |
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