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Strategic Energy and Water Resource Planning for Federal Facilities

A recent survey¹ of nearly 1,000 top international executives found that strategic planning was the most popular scientific management tool, used by nearly 80% of the companies surveyed. If strategic planning is important for these companies, then why not for your site?

Strategic planning is important for your site. Good planning leads to energy and water conservation, and the resulting savings get passed on to the taxpayer. In addition, it helps you convey your vision to others in your organization so that they can help you achieve your energy and water savings goals.

Strategic planning means different things to different people. What should a strategic plan look like? Ask a regional manager, a site energy manager, a financial officer, and a field technician and odds are you will get four different answers. It very much depends on one's perspective—which means that the process of defining what a planning document should contain is equally as important as filling in the details of the plan.

This document provides a detailed look at the strategic planning process based on advice from planning experts as well as real-world experience in developing planning documents for federal sites and agencies. Recognizing that "one-size-fits-all" planning and fill-in-the-blank templates can be exercises with little long-term benefit, this document attempts to help someone about to embark on the planning process evaluate what his or her unique plan should contain. This document focuses on strategic planning for energy and water resource management, but the general principles outlined herein are applicable to all types of strategic plans.

Legislation for Federal Agencies

The following is a list of relevant legislation applicable to all federal agencies that should be included in the planning document:

- Energy Policy Act of 2005: Federal agencies shall, through life-cycle cost-effective measures, reduce the energy consumption per gross square foot by 2% per year in fiscal years 2006 through 2015 as compared with 2003.
- Code of Federal Regulations (10 CFR 436)
- Executive Order 13221: Energy-Efficient Standby Power Devices, dated August 2, 2001
- Presidential Directive on Energy Conservation at Federal Facilities, dated June 2001
- Executive Order 13423: Strengthening Federal Environmental, Energy, and Transportation Management, dated January 24, 2007

In addition to the source material noted above, each federal agency, as well as sub-departments, may have other relevant directives, instructions, and/or plans critical to the effective operation of a site-level energy management program. The Federal Energy Management Program (FEMP) is responsible for helping agencies meet energy and water savings goals.

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¹ *Economist Magazine*. News and Business Publication, April 7, 2005.



The strategic plan

A strategic plan is simply a written document that describes the current operating environment, sets goals for future operation, and defines responsibilities for actions necessary to reach those goals.

Strategic plans can be developed for any aspect of facility operation, including energy, water, wastewater management, and sustainability. The strategic plan should be viewed as a roadmap that will guide operations decisions to obtain a desired outcome. A key element of the strategic plan is contingency planning, which is proactively preparing how to handle problems before they arise.

Strategic plans have been done for many federal agencies. Those plans can flow down to the regional, site, and facility level, as appropriate. (See examples listed under “What does a strategic plan look like” later in this document.)

Getting Commitment

The visible commitment of top-level management is a requirement for the success of any program. That commitment has to filter down to all levels within an organization. The endorsement of the site-level strategic energy management plan is one method to communicate that local level of commitment. Financial support for planning activities also demonstrates that management views this as an important activity. The need for communication with top-level management is another reason why the information in the plan must be distilled down into clearly stated ideas and concepts in a good document summary.

All strategic plans, no matter who is writing them or what topic they are addressing, tend to have five major elements. Simplistically, these can be characterized by five questions one could ask:

- Where are you coming from?
- Where are you now?
- Where do you want to be?
- How do you get there?
- What do you do when problems arise?

We will look at the contents of each element in the following sections.

1. Where are you coming from?

The first step in figuring out where you want to go is to remember where you are coming from. In this section of the strategic plan, you will identify the rules that you have to play by that influence and define your work environment. These will include all applicable legislation, regulations, and requirements, whether these are federal-, state-, municipal-, agency-, or site-driven. Make sure you clearly understand and document how these elements affect what you can do, what you cannot do, and what you are required to do.

Also take a hard look within your own organization to determine who needs to be involved in this strategic plan from the start. Identify the stakeholders and identify key players. Open lines of communication and begin to solicit input into the planning process. Determine if the way your staff is organized will create obstacles to successful planning and implementation, and begin to work on remedies. Begin to assess where the needs lie and set goals about what you hope to achieve.

Things that your plan may contain that “define your environment”:

Summary of relevant legislation, orders, and directives:

Federal resource management programs exist primarily as a result of legislation, executive orders, and other agency directives. Many goals and performance metrics for federal facilities are based on or are a direct result of the same requirements. For this reason, it makes sense to include a section summarizing the most relevant legislation, executive orders, and directives. This section can be limited to a series of brief summaries including only the items specifically relevant to the site and/or agency resource management program. Make sure to include your specific agency requirements because sometimes they can differ from the federal legislation and orders.

Summary of relevant history: Is your facility located in an area of the country that is facing repeated power outages, rolling blackouts, or other energy disruptions? Is your facility dependent on surface or ground water supplies that are subject to depletion? Are you vulnerable to drought? Are there any specific issues that impact resource management at your facility?

2. Where are you now?

Your next step is to paint a picture of where you currently are in terms of energy and/or water use. Start with your metered data to look at energy or water use patterns. Go beyond site total usage and try to determine usage patterns in specific

buildings, sections of your facility, or for various end-uses. Getting to this information could mean using sub-metered data, installing temporary metering, modeling, or using other analysis tools to estimate usage by end-use. Don't underestimate the value of additional analysis, data collection, or audits. When you start looking at opportunities to make changes, having even rough estimates of end-uses will help you set goals and identify projects.

- Assess current conditions of energy-and-water consuming equipment and processes. Look at your utility infrastructure and determine if the distribution system will be adequate for future needs.
- Quantify current use, operations, costs, current condition of equipment.
- Assess current condition of distribution system, meters, and other equipment.
- Audit your facilities, install temporary or permanent metering equipment to learn how your site really operates.

Things that your plan may contain that help “establish baseline conditions”:

Summary of historical usage data: Tracking energy and water consumption is a useful tool in monitoring the status of a resource management program. In addition, historical energy and water consumption is a basic performance metric. This section should include a recent summary for each resource.

This section should be limited to the most relevant or simplified summary, which may include only a few charts, depending on what the site program staff deem most appropriate.

Summary of Utility Info: This section should document current resource tariffs and incremental rates for all site energy sources, such as electricity demand and consumption, natural gas, fuel oils, water, and wastewater treatment. The specific reference source and date should also be documented.

Summary of Projects: This section should summarize what energy and water projects have been done in the past, how they were funded, and what savings has been achieved. Also, list planned and future projects. If your installation has a specific financing mechanism (e.g., Energy Savings Performance Contract or Utility Energy Services Contract), document the contract and process as well.

In the absence of building-level utility data, there are a variety of energy modeling tools that would allow allocation of utility usage to buildings or even end-uses within buildings. Without knowing specifics about where energy and water are used in a facility, determining where savings opportunities exist can be difficult. An energy model can help a site allocate a “master meter” to many uses.

Even when you are fortunate enough to have building-level metering, that may not be enough detail to understand how a specific building is performing. Without going to the effort of energy modeling, a building's performance can be evaluated through a process called “benchmarking.” Benchmarking

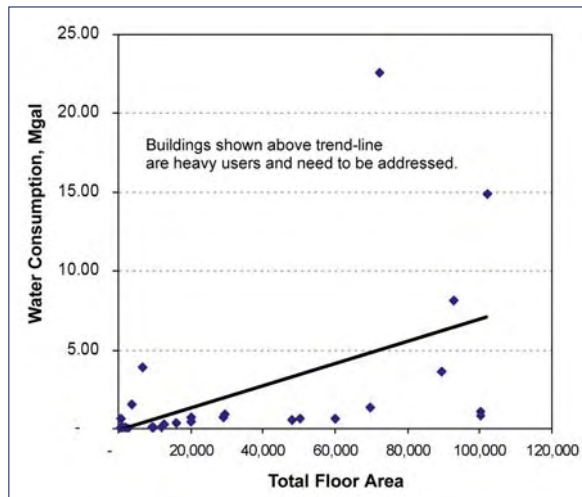
Who Should Do Your Strategic Planning?

So your organization needs to develop a strategic plan, but who really has the time? Your team has intimate knowledge of the site and its unique needs, but thinking long term may be a shift in the way you normally operate. Do you do it yourself or bring in an outside group to help you through the process? There are advantages and disadvantages to both approaches.

Measures	In-House Staff	Outside Organization
Has detailed site-specific knowledge	Absolutely	Learning curve
Has the time to devote to the task	Already has many responsibilities	The plan will be their sole focus
Has experience in developing strategic plans	May have some knowledge of how this should be done	Has experience developing plans to meet specific needs
Costs	May be a burden on staff resources	Must find funding for external group
Brings a fresh perspective	May tend to focus on detail	May tend to focus on the big picture
Knows what has worked at other sites	Will have to network to see what other have done	Can bring lessons-learned from experience at other sites

Strategic Resource Planning

involves organizing buildings into similar groups (e.g., all medium-sized admin facilities with no labs) and calculating an “energy use intensity” (EUI) in energy use per square foot. Buildings with high EUIs compared to other similar buildings are the ones that should be addressed first (see chart below). It is also profitable to chart a building’s EUI over time to see if energy performance has degraded over the years.



Remember, the more detail you can glean from existing data, the easier it will be to identify savings opportunities and set performance goals.

3. Where do you want to be?

At this point, you probably have an idea where you want to be, but it’s time to get specific in laying out how to get there. This is the section where you:

- Identify potential projects and set goals.
- Assess the future—mission changes, expansion, demolition, infrastructure changes.
- Identify potential projects, both short term and longer term.
- Set goals for conservation and/or operations improvements.

Things that your plan may contain that “set goals”:

Specific performance goals. For example, is your goal to reduce energy consumption at your facility by 35% by the year 2010 in accordance with EO13123? (Hopefully, you do have this goal or something like it. Executive Order goals are issued at the agency level and typically flow down to the site level. Your site may be able to save even more than the 35% goal your agency is charged with in EO13123.) Do you have a goal to recycle or reuse 100% of your wastewater by 2020? Are there other sustainability or greening goals you wish to implement?

Goals-setting can be a tricky process. If all your goals are easily achievable, it doesn’t really have much value. On the other hand, if all your goals are so far-reaching, you may never achieve any of them. The best scenario would be a mixture of a few short-term goals that will be achievable with some amount of work, mixed together with some longer-term goals that may be very difficult to achieve but will push your organization to transform itself into something better.

Evaluating Progress

Once you determine current conditions and begin to move forward, there should be some mechanism to measure progress toward your goals. Certainly, charting energy use intensities or simply dollars or Btu’s saved can be an indicator of progress. However, these don’t allow you to characterize improvements to specific areas within your organization. To do this you need to develop a “scorecard”—a kind of rating system. This scorecard attempts to capture all aspects of your organization that affect the way you manage utilities.

For example, the scorecard on the next page is adapted from the Carbon Trust, a non-profit organization in Great Britain whose goal is to reduce carbon emissions. They hope to achieve their goal through a number of mechanisms, including energy efficiency through strategic planning. In this scorecard, a site can measure which parts of an organization are performing at a high level and which parts need to move forward. Such a scorecard method should not be used as part of a one-time-only activity; but rather should be used on a regular basis to chart progress. A scorecard provides an overall picture of your organization, but should not take the place of stated goals, with assigned responsibility and completion dates.

Priority	Policy	Organization	Awareness	Training	Operations & Maintenance	Accounting & Information Systems	Project Investments
	10	10	10	10	20	15	25
4	Energy policy, action plan, and regular review have commitment of top local management as part of an operating strategy. Local policy consistent with regional and headquarters policy.	Energy management fully integrated into management structure. Clear delegation of responsibility for energy consumption.	Channels of communication regularly exploited by energy manager and energy staff at all levels. Proactive local and national awards and recognition program supported.	All energy users receive specific energy training integrated into other development activities. Workshops facilitate a sharing of knowledge.	Proactive maintenance program. Most energy consumers, equipment and processes, submetered, efficiencies monitored for deviations.	Comprehensive system sets targets, monitors consumption, identifies faults, quantifies savings, and provides budget tracking.	Positive discrimination in favor of green schemes with detailed appraisal of all new construction and retrofit opportunities.
3	Formal local energy policy but no active commitment from top local management. Minimal involvement from regional or headquarters office.	Energy manager accountable to energy committee representing all users.	Energy committee used as main channel together with direct contact with major users. Program of staff awareness and regular publicity campaigns. Occasional award nominations prepared.	Key energy users receive regular and specific training. Brief awareness training provided to all energy users.	Predictive maintenance program. Efficiency of major energy consumers monitored.	Monitoring and targeting reports for individual areas based on submetering, but savings not effectively reported to user.	Life-cycle cost effective projects pursued using conventional and alternative funding mechanisms.
2	Unadopted energy policy set by local management. Informal guidelines communicated by regional and headquarters office.	Energy manager in post, reporting to ad-hoc committee, but line management and authority unclear.	Contact with major users through ad hoc committee chaired by senior manager. Some ad hoc staff awareness training. Ad hoc awards and recognition process.	Key energy users receive awareness training, also occasional system-specific training.	Preventive maintenance program. EMCS features used to monitor equipment performance.	Monitoring and targeting reports based on supply meter data. Energy unit has ad hoc involvement in budget setting.	Investment using short-term pay-back criteria only. Primary reliance on appropriations as a funding mechanism.
1	An unwritten set of guidelines by local management. No guidelines communicated by regional or headquarters office.	Energy management the part-time responsibility of someone with only limited authority and influence.	Informal contacts between engineers and a few users. Informal contacts used to promote energy awareness. Ad hoc award process.	Key employees participate occasionally in awareness training. Some information passed informally to energy users.	Primary reliance on scheduled maintenance activities. Few major energy consumers monitored.	Cost reporting based on invoice data. Engineer compiles reports for internal use within technical department.	Only low-cost, no-cost measures taken.
0	No explicit policy set by local site management.	No energy management or any formal delegation of responsibility for energy use.	No promotion of energy awareness, energy efficiency, or energy management. No awards and recognition program supported.	Energy users rely on their existing knowledge.	Equipment repaired on failure. No specific monitoring of large energy consumers.	No information systems. No accounting for energy consumption.	No investment in increasing energy efficiency at the site.

Adapted from the U.K.'s Carbon Trust Initiative, <http://www.carbontrust.co.uk/Publications/GPG306.pdf>

Scorecard for Assessing Progress Toward Goals

4. How do you get there?

The strategic plan should look at the future. What needs to be done (by whom and by when)? What might happen (to whom and with what consequences)? And because the future is changing, your strategic plan also has to change.

Strategic planning is a *process* of analyzing current conditions, defining how they should be, determining how to get there, and identifying what to do when certain things happen. As part of the on-going process, a document called a strategic plan is created. But remember that the document is a single outcome of the process, not the end result. It should not be a one-time activity, but periodically revisited. It is a way to identify and focus on potential projects and stimulate thought around setting goals.

How do you plan to get from where you are to where you want to be? We have already discussed goals, but these need to be set into motion by defining actions to move forward. Developing a roadmap can help organize individual actions under strategies to chart a path forward.

How will you know that you are making progress? The planning process should be iterative—that is, periodically you should look at your progress toward goals and adjust if necessary. Setting smaller performance metrics will help you chart your progress. Performance metrics can be as basic as “redesign service request form” to as aggressive as “reduce utility costs 2% per year.” Each defined action should have a means to determine if it has been successfully implemented.

5. What do you do when problems arise?

When unplanned, but foreseeable problems arise, you should already know what your response will be. Your strategic plan should include proactive contingency plans that define how triggers drive mitigation actions into motion, what those actions will be, and who the point-of-contact is for different events. Good contingency plans typically include the formation of core teams that are responsible for responding to these problems, which often require training and advance coordination.

What events should you plan for? Contingency planning can include:

- Drought
- Natural disasters
- Emergency outages or curtailments

- Terrorist threats
- Mission change

There is no need to reinvent the wheel. If contingency plans exist in other forms or within other organizations (such as state or local government), simply reference the alternate contingency plan in your planning document, recognize its authority, and summarize your organization’s responsibilities.

Know what to do when things happen, even before things happen. Be proactive, not reactive.

The strategic planning document is a single outcome of the process, not the end result.

Strategic plan format

The document itself can take many forms. It should not be viewed as a static document, but rather one that is updated frequently. At a minimum, the document should be updated annually to include up-to-date utility data, cost information, and personnel responsibilities.

The document should include a summary describing the important issues of your energy and water programs that would be useful to upper level management. The main body of the strategic energy and water management plans should be brief and focused and should include only material that is directly relevant to utilities management. All supporting information that technical staff may desire needs to be placed in an appendix and referenced appropriately.

The Department of Navy Shore Energy Business Plan² template is a good example of how planned action is “rolled up” into a few, key target areas. The GSA Region 10 Strategic Energy Management Plan is an example of a plan at the regional, rather than agency or site, level.³ Another example of a site management plan (this one for water only) is the Fort Buchanan Water Management Plan.⁴ An additional site-specific strategic plan is the Fort Lewis Installation Sustainability Plan.⁵ A select number of goals should be identified for each of the key target areas. A select number of

2 https://energy.navy.mil/publications/businessplan/DON_Shore_Business_Plan_Final.pdf as of September 20, 2005.

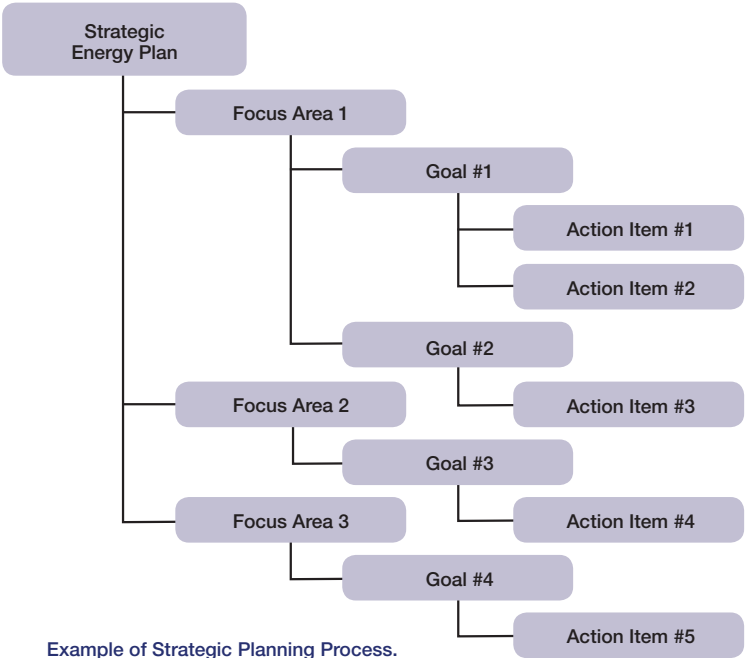
3 <http://www.nrel.gov/docs/gen/fy05/36393.pdf> as of September 20, 2005.

4 <http://eere.pnl.gov/femp/publications/StrategicEnergyManagementPlan-FtBuchanon.pdf> as of September 20, 2005.

5 Discussed at http://www.energy2005.ee.doe.gov/pdfs/lsp_s2a.pdf as of September 20, 2005.

strategies should be identified that will support the accomplishment or progress toward each of the goals. The Navy requires that specific actions be assigned to support each strategy (and detailed in the appendix) with a specific person assigned responsibility. Furthermore, each goal should have one or more performance metrics developed or identified that can be used to illustrate status or progress toward that goal. The figure on the right illustrates how a plan can be constructed to roll-up details.

The following is an example of the process described above. Assume a federal agency site has identified “Management” as a key focus area within its strategic plan. Under that focus area, the energy manager has identified the goal to “broaden knowledge and general awareness of energy management.” There may also be other goals identified under the management focus area. To support the goal identified above, one strategy may be to “provide training in energy management and energy engineering to the facilities’ engineering and operations and maintenance (O&M) staff.” Another strategy may be to “provide energy awareness and energy conservation training to general office staff.” In support of the first strategy listed above, the strategic plan could identify several specific actions items, such as “train O&M staff on energy-efficient procedures through the FEMP O&M training workshop.” Another action item might include, “provide energy management training from a nationally recognized provider to engineering staff.” Performance metrics for this goal could include number of trained staff, number of training staff-hours, and/or number of certified energy managers.



Example of Strategic Planning Process.

Conclusion

At some point, you may be required to develop a strategic energy plan for your organization. Take this as an opportunity to really get to know your facility and think about the future needs of the facility.

So what will your plan look like? Chances are pretty good that a template or other statement of requirements from your organization will govern your plan. It is your job to work within existing requirements and still craft a plan that is both informative and useful to your organization. Remember, the goal is to create a document that is used, not just put on the shelf to satisfy some requirement.

FEMP Help Desk: (800) 363-3732
International callers please use (703) 287-8391
Web Site: www.eere.energy.gov/femp



For More Information

Energy2005 hosted two speakers focused on strategic energy planning in the Leadership, Strategies, and Performance track, Strategic Energy Management Session, including presentations on the development of the GSA Region 10 Strategic Energy Management Plan and the Fort Lewis Installation Sustainability Program. Their presentations can be found at <http://www.energy2005.ee.doe.gov/lsp.cfm#lsp2>.

Energy2004 hosted three speakers focused on Strategic Energy Planning during Session 3. Their presentations can be found at: <http://www.energy2004.ee.doe.gov/tracks-ppl.htm>.

The Association of Energy Engineers offers an on-line course on Strategic Energy Planning: <http://www.aeecenter.org/realtime/SEP/>.

The U.S. Department of Energy's Tribal Energy Program has an energy planning guide that can be found at: <http://www.eere.energy.gov/tribalenergy/guide/strategic.html>.

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