Office of Civilian Radioactive Waste Management (OCRWM)
Energy Conservation Plan

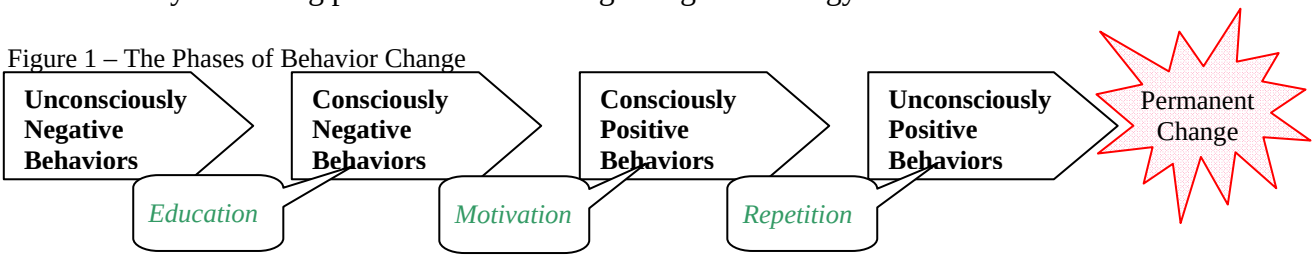
Summary: Development and implementation of this plan is being treated as a project. This serves two purposes. First, it increases familiarity with the precepts of project management and DOE Order 413. Secondly, project management provides a great structure for organizing and implementing the activities that will facilitate energy savings through behavioral changes. A project structure also helps define how the effort will begin and what constitutes success at the end of the effort. A graded approach to project management was selected since this effort is not for a traditional capital project. The project team was assembled on January 8 to brainstorm the options for changing behaviors in ways that will ensure energy savings in the long term. The team defined the constraints we will work with, the assumptions that would guide our process and the benefits of the project to the office and the Department. The following narrative describes the educational efforts and incentives for energy savings that form the core of this plan. As the attached Gantt chart shows, some of the steps in this project have completed, but many more are scheduled for completion over the course of the next 3 months. Some of the behavioral changes addressed in this plan would be facilitated by capital projects to alter the work environment. Even though this plan does not focus on capital projects, those recommendations are included for future consideration to enhance the purely behavioral oriented elements this plan focuses on.

Requirement: A **c**hallenge from the Office of Management and a task assignment from the RW Chief Operating Officer. Guidance is available on the EERE website at: http://www1.eere.energy.gov/femp/services/energy_aware.html

Situation Assessment: To determine the best implementation alternative for this project, a quick assessment was made of RW's strengths, weaknesses, opportunities and threats in regard to saving energy. This "SWOT" analysis was discussed at length by the project team. This analysis was key to combining education with incentives as the basis for the project plan.

Project Approach: This plan's approach to saving energy is derived from an organizational development model for changing behaviors. This model (illustrated in Figure 1) assumes the undesired behaviors are often unconscious and are perpetuated by a lack of understanding of the negative impacts these behaviors have. Changing these behaviors starts with a process of educating the workforce on the impacts undesired behaviors have and identifying alternate behaviors with positive impacts. This shifts people to a position of being conscious of the impacts current behavior have on the workplace. This may make people feel awkward about their current behavior, but that may not be sufficient to change the behaviors. By adding incentives, individuals will migrate to consciously positive behaviors. If there are no structural challenges in the workplace that complicate positive, energy saving behaviors, they will become second nature through repetition. The goal is to shift a meaningful portion of the workplace into unconsciously exhibiting positive behaviors regarding their energy use.

Figure 1 – The Phases of Behavior Change



Project Implementation: In a technically oriented workforce, employees expect information and analyses to justify any requests for changes in their routines. Putting incentives in place to change the way energy is used without explaining why the changes are important will only succeed in the short term change. As soon as the incentives are gone, wasteful behaviors will return. Information that quantifies the impact of wasteful behaviors is a critical component of creating the level of acceptance needed for lasting change. Once the staff is convinced that changes in their behavior will make a meaningful difference they will be more receptive to short term incentives, and more likely to adopt permanent changes in their energy use behaviors. This assessment led to a project plan with the following key phases:

- Phase 1 – Conduct an energy use inventory for the Office of Civilian Radioactive Waste Management (100% complete);
- Phase 2 – Analyze the energy use data and organize the data into logical groups that can jointly benefit from specific behavioral changes. Quantify the savings that are achievable from specific behavior changes and make recommendations (100% complete);
    - ✓ Lighting is the first logical group and it constitutes 63% of the total electrical energy consumed by OCRWM (see Table 1). Since this is such a major driver of our energy use, it is the primary target for the energy saving competition that follows;
    - ✓ IT equipment (computers, scanners, copiers, printers, V-Tel equipment), is the second logical group of energy using equipment that this plan targets. This group of equipment is targeted for energy savings initiatives by the IT community so individual behavioral changes need to be integrated with that larger effort. The educational materials will address this integration.
    - ✓ Appliances (refrigerators, microwaves, coffee pots, space heaters and fans) are the third logical group of equipment. This group is a minor source of overall office energy consumption, but small behavioral changes in the use of appliances can have a meaningful impact. One specific challenge that is being issued to the staff is replacement of individual appliances with joint use appliances in common areas (e.g. one large coffee pot in a common area rather than ten in individual offices).
- Phase 3 – Develop the incentive program. Communicate the information and analyses on current impacts along with the incentives for change as part of a coordinated roll-out of the energy savings challenge (scheduled for 25 February, 55% complete);
    - ✓ Provide goals and incentives for energy saving changes in behavior based on the analyses presented in Phase 3.
    - ✓ Create internal competition for energy savings within RW by offering separate incentives for each of the four office suites occupied by RW staff.
- Phase 4 – An energy champion in each office suite will track energy saving accomplishments (like % of lights that are turned off, number of employees in the suite that sign energy saving pledge forms, and reduction in appliance use) on a performance check list. The checklists from each office suite will be collected monthly and the results will be communicated back to all of the staff. Monthly awards for the best percentage improvement in energy use will be presented to the winning office suite(s) in group settings to further incentivize broad adoption of the changes. Feedback will be solicited

from the staff on barriers to wider adoption of energy saving behaviors. Work within management to remove or reduce those barriers. This feedback loop is scheduled to begin on April 2nd, and will be repeated monthly through the end of the fiscal year.

Current Energy Plan Status: As the attached project Gantt chart shows, the initial inventory of energy use in OCRWM is complete. OCRWM occupies office areas on the north side of corridor 5A, on the north side of corridor 7F, the south side of corridor 7F and the east side of corridor GH. Competition between these office suites for their contributions to energy reduction (as a percentage of normal use) is at the heart of incentivizing savings.

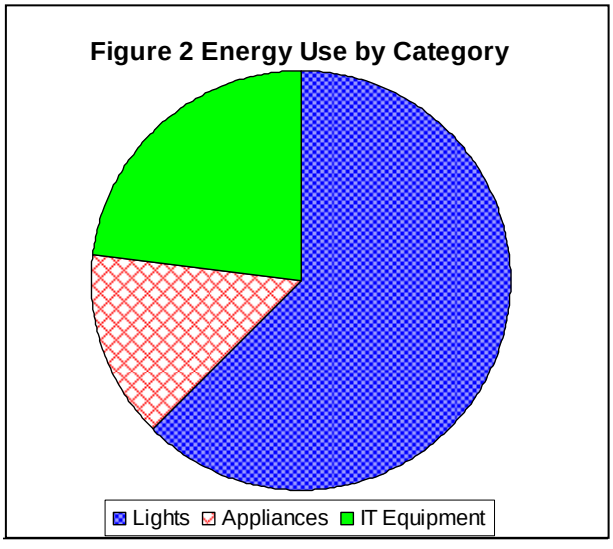
The completed educational packages for launching this competition will be distributed as tri-fold handouts. These are scheduled for distribution on February 25th, as the competition is launched. The educational data will include information on energy use by category of equipment for each office suite, actions individuals can take to reduce that energy use and how individual efforts are integrating with corporate efforts.

Table 1, Energy Use by Office Suite and Category

	Current Use - Watt Hours/year			
Location	Lights	Appliances	IT Equipment	TOTALS
7F-S	38,754,240	15,942,800	15,119,000	69,816,040
7F-N	69,904,800	13,690,600	22,178,000	105,773,400
5A-N	44,886,240	6,194,400	11,817,000	62,897,640
IT	25,999,680	4,964,000	17,362,800	48,326,480
Total	179,544,960	40,791,800	66,476,800	286,813,560
% of total	63.00%	14.00%	23.00%	286,813,560

The tri-fold brochures will also incorporate pledge forms to encourage individual participation. Energy savings champions will be recruited from each office suite to track that suite's performance. Energy savings will be tracked on a monthly basis and a monthly incentive award will be presented to the office suite with the greatest percentage reduction.

Conclusions and Recommendations: The data collection and analyses performed by OCRWM clearly shows that the vast majority of our energy use is for lighting (see Table 1, and Figure 2). As a result, the educational effort in this plan will focus on this key area of energy use. Saving energy in other areas will also be encouraged, but the lighting remains the area of greatest potential impact, particularly since it is amenable to savings from behavioral changes. Table 2 captures some of the other behavioral changes that are being incorporated into the educational tri-folds for the OCRWM energy savings competition. Although this energy plan concentrates on behavior changes in the RW Offices, there are other actions affecting common use areas



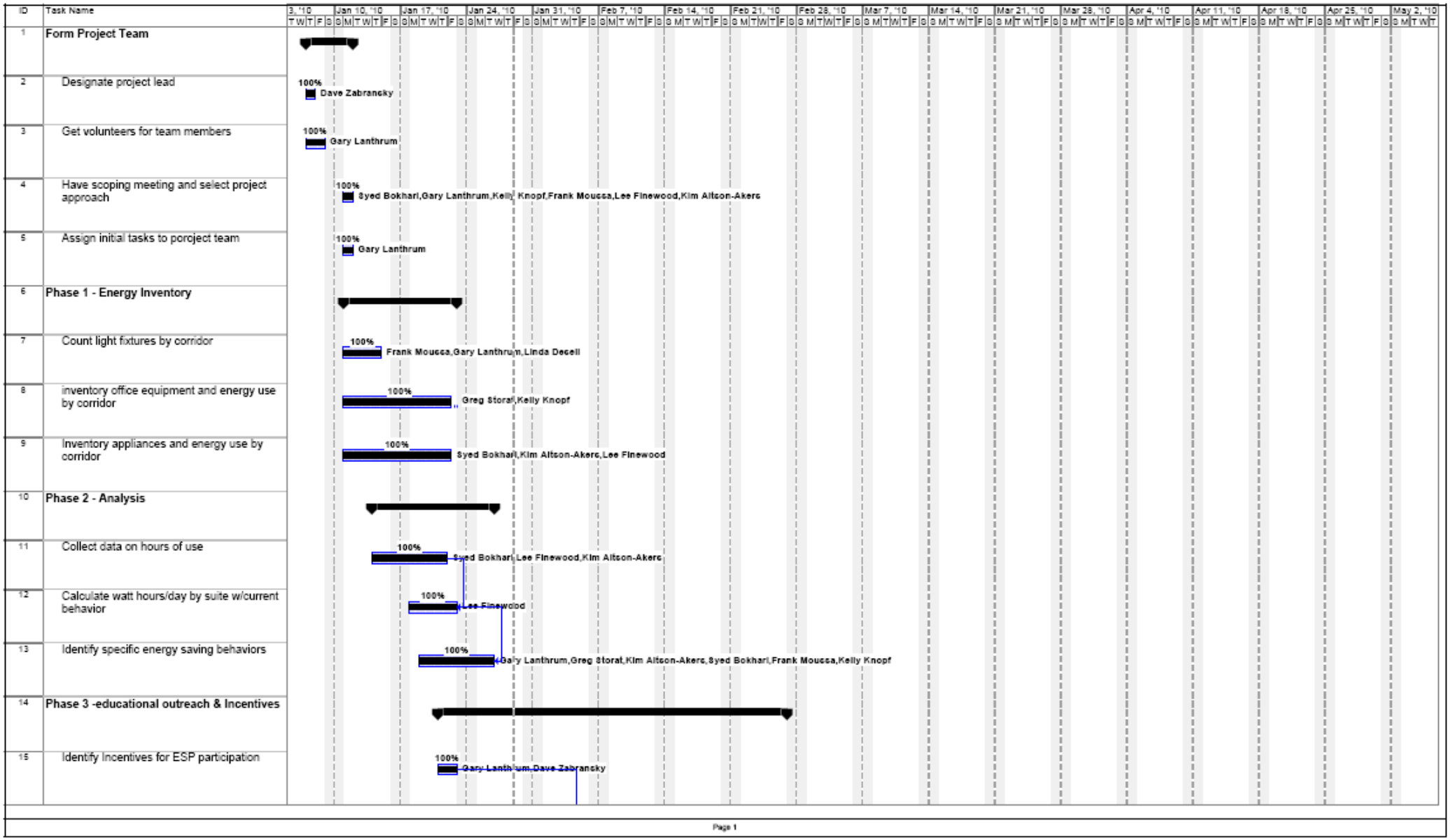
(like main hallways), or requiring capital investment that would facilitate individual energy saving efforts. Some of these improvements have already been identified as part of the energy inventory conducted by the project team, and are also captured in Table 2. Additional opportunities will be identified by the participating staff as this effort continues and will be forwarded to OCRWM and MA management for consideration.

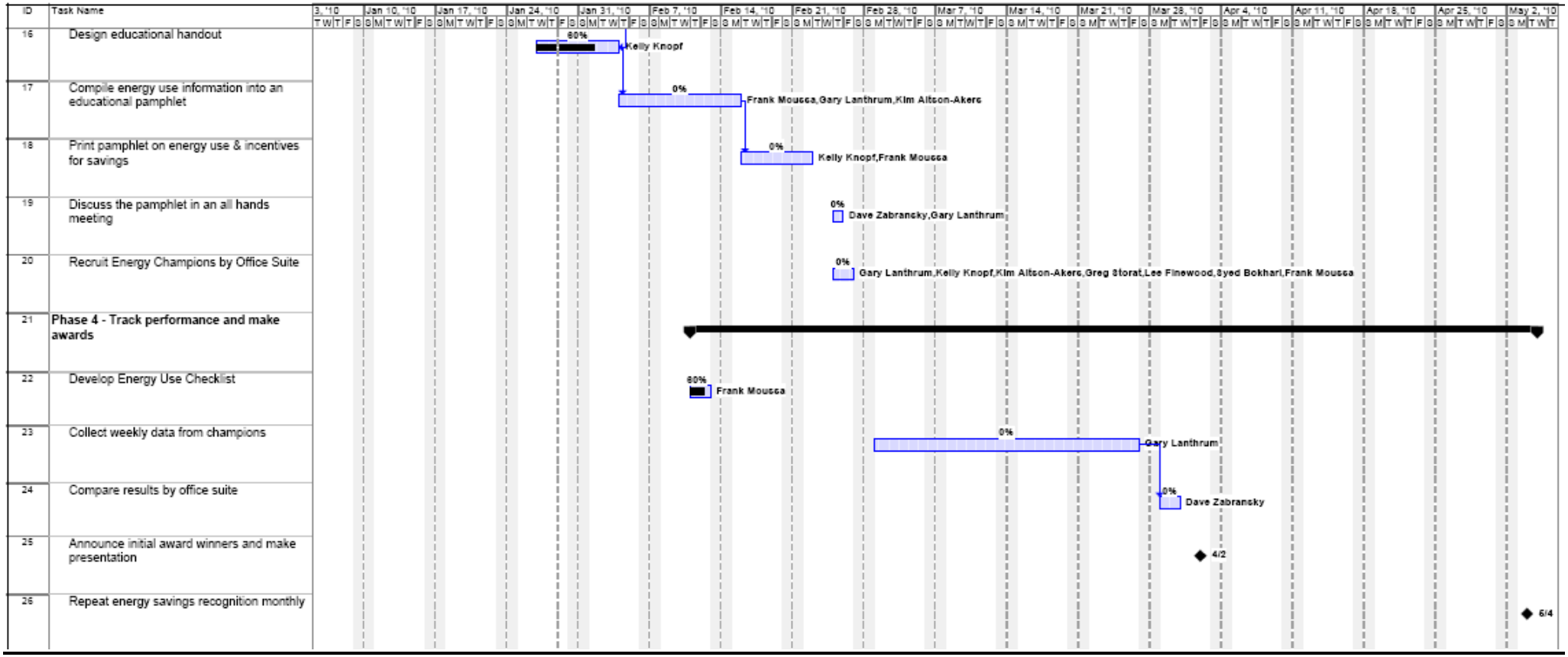
Table 2. Recommendations to Date

Currently Recommended Behavior Changes:
Develop a pledge and reward program for individual energy saving activities (reduced elevator use, reduced use of freezers, turning off unused lights and equipment etc);
Turn off every other bank of lights in main hallways (a facilities function);
Consolidate federal staff into contiguous office spaces and turn off unused lights & heat;
Consolidate coffee pots, refrigerators and microwaves into common areas and reduce the number of individual appliances being used;
Expand the use of flexiplace to reduce commuting energy use;
Hibernate computers when leaving the office for extended periods, and shut them down when departing for the day (even though DOECOE automatically hibernates them at 9:00 PM);
Stop use of heating and cooling systems periodically (1 hour out of 4) and let the building coast on thermal intertia;
Follow-On Capital Improvements for Consideration
Installing local lighting controls to let each office turn off their lights without affecting common areas, or adjacent offices;
Central Switching for Office Lights to kill lighting to a whole suite at a time;
Installing motion detectors to automatically turn lights off when there is no activity;
Remove permanent walls and expand the use of modern cubicles to improve air circulation and normalize temperatures;
Install smart-zones for heating and cooling to allow more local and tailored control (don't heat one office to 78 degrees just to get the temperature up to 65 in an adjacent office).
Install timers for IT equipment (printers/scanners/plotters,V-Tel eq) in common rooms

Project Status: The attached Gantt chart shows each step in this project plan, and the current project status. Many of the tasks in this plan have already been completed and others are in progress. The level of engagement to date has focused on a core group of change agents that will roll the plan out to the rest of the organization on 2/25. The project will be sponsored by the OCRWM Chief Operating Officer with support from the project lead. Results from the educational effort will accrue immediately, but reports of measurable monthly savings will not be available until April 2nd. Updates and recognition for continued energy savings contributions will be provided monthly through until energy saving behaviors become unconscious and consistent.

Energy Saving Project Gantt Chart




ID
Task Name
16 Design educational handout
17 Compile energy use information into an educational pamphlet
18 Print pamphlet on energy use & incentives for savings
19 Discuss the pamphlet in an all hands meeting
20 Recruit Energy Champions by Office Suite
21 Phase 4 - Track performance and make awards
22 Develop Energy Use Checklist
23 Collect weekly data from champions
24 Compare results by office suite
25 Announce initial award winners and make presentation
26 Repeat energy savings recognition monthly
Jan 10, '10
Jan 17, '10
Jan 24, '10
Jan 31, '10
Feb 7, '10
Feb 14, '10
Feb 21, '10
Feb 28, '10
Mar 7, '10
Mar 14, '10
Mar 21, '10
Mar 28, '10
Apr 4, '10
Apr 11, '10
Apr 18, '10
Apr 25, '10
May 2, '10
80%
Kelly Knopf
0%
Frank Moussa,Gary Lanthrum,Kim Allson-Akers
0%
Kelly Knopf,Frank Moussa
0%
Dave Zabransky,Gary Lanthrum
0%
Gary Lanthrum,Kelly Knopf,Kim Allson-Akers,Greg Storat,Lee Finewood,Syed Bokhari,Frank Moussa
80%
Frank Moussa
0%
Gary Lanthrum
0%
Dave Zabransky
4/2
6/4