Implementing Sustainability: the Behavioral-Institutional Dimension

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Organizations, both public and private sector, are increasingly pursuing strategies to reduce their energy use and increase sustainability. Whether these efforts are based on economic rationale, community spirit, environmental ethics, federal mandates, or other reasons, they predominantly feature strategies that rely on new technologies. If there is any focus on behavior change, it is typically addressed to changing individual behavior. While we recognize the importance—and limitations—of the role of individual behavior in promoting sustainability goals, we are more interested in the role of institutional behavior. We have reviewed the small but growing literature on institutional behavior change, and have identified eight "evidence-based" principles as a guide for federal agencies to take action. This article presents the principles and illustrates them with examples to suggest ways that they can serve as models for others.

Changes in behavior, institutions and technology, working together, can transform the workplace into an energy-efficient and sustainable space – and, in the process, improve the way things are done, improve comfort and productivity, and save money and resources. This process is not, as some have claimed, easy or cheap, but it can result in significant and persistent change.

Federal agencies may already have woven sustainability into their missions or only just taken the first steps toward sustainable practices. Whatever the agency's starting position, sustainability is taking on new importance, as evidenced by the requirements of Executive Order 13514, *Federal Leadership in Environmental, Energy and Economic Performance*. But meeting the E.O.'s requirements is only one step in institutional change within federal agencies to make sustainability the way of doing business.

Sustainability is an inherently integrated concept, and strategies employed to achieve sustainability must also be integrated. Technological change certainly is an essential element, as are changed policies and procedures. But these strategies must be complemented by changed behaviors, both individual and institutional, at all levels. Beyond formal policies and procedures, the informal rules and shared assumptions of the group may need to change. The agency and its subgroups need to value sustainability and build it into the workplace, or desired changes may neither be realized nor persist. People have largely been treated as background players or as the objects of awareness or education campaigns, and not as integral elements of change. Our project group within the Federal Energy Management Program (FEMP) emphasizes people in focusing on individual and institutional change.

Certainly there is much to be learned about how to change individual and institutional behavior. But a developing body of research suggests a promising set of principles for how to design and implement energy efficiency and sustainability programs. These principles are not a magic formula for instigating or maintaining change, a "cookbook" for action, or interchangeable items. Rather, they are the evidence-based foundation for selecting strategies to adopt to meet specific energy-efficiency and sustainability goals within particular workplace contexts.

First we list the principles, then briefly discuss each and provide examples.

1. The Social Network and Communications Principle: Institutions and people change because they see or hear of others (individuals, groups, institutions, firms, etc.) behaving differently.

2. The Multiple Motivations Principle: Institutions and people almost always change their ways of doing things for more than one reason.

3. The Leadership Principle: Institutions and people change because the workplace rules change and visible leadership communicates management commitment.

4. The Commitment Principle: Institutions and people change when they have made definite commitments

to change, especially when those commitments relate to future conditions.

5. The Information and Feedback Principle: Institutions and people change because they receive actionable information and feedback.

6. The Infrastructure Principle: Institutions and people change because a changed infrastructure makes new behaviors easy and/or desirable.

7. The Social Empowerment Principle: Institutions and people who feel they can reach desirable social goals – often do.

8. The Continuous Change Principle: Institutional change takes time.

The Social Network and Communications Principle: Institutions and people change because they see or hear of others (individuals, groups, institutions, firms, etc.) behaving differently.

Description: In its institutional dimensions, this principle captures the observation that people bring their values, beliefs, and actions into line with those of others. We are social beings who behave in ways that are deeply, sometimes unconsciously, influenced by the expectations and actions of others. When conditions change, we take notice of what others are doing and often are led to similar actions. Social network researchers have found that you can lose weight or quit smoking if someone even two or three degrees separated from you (i.e., whom you don't know) accomplishes these goals. The same tendency to do what others do has been observed in organizations; they often structure themselves in the same ways and have similar "corporate trappings" such as visions and missions.

Practical Advice for Program Design and Implementation: In a nutshell, make sure staff see or hear about others who have changed their office settings or patterns of behavior. The implications of this principle for sustainability programs are that programs will be much more effective if they make visible throughout the institution that other institutions and people have adopted sustainability-relevant behaviors. What works: involving staff in the discussion of proposed changes, ensuring that managers and leaders model desired behaviors (see the Leadership Principle) and continuously relaying stories about others' successes.

Examples that Support this Principle: The U.S. Fish and Wildlife Service emphasizes personal contacts and meetings to communicate energy efficiency and water conservation practices that have spread throughout the agency. Energy monitors in the Navy's Region Southwest Metro San Diego Area (NRSMSD) used email messages and training to communicate the activities of the team – resulting in a 37% reduction of energy use between 1985 and 2005. In fiscal year 2011, the U.S. Air Force's Air Mobility Command saved more than 42 million gallons of aviation fuel through implementing ideas from a broad range of personnel.

The Multiple Motivations Principle: Institutions and people almost always change their ways of doing things for more than one reason.

Description: By themselves, sustainability goals may not get much traction in an organization. They may be seen as another unfunded mandate or "other duties as assigned" – unless there are other benefits to be gained along with meeting the sustainability goals. One benefit for groups and individuals might be that sustainability goals are extensions of or consonant with efforts they're already making, like buying fair trade coffee and Energy Star computers and appliances, seeking LEED certification for their new building, or riding bicycles to work. Other appeals that, alone or in combination, have been found to motivate people include the wish to "do the right thing," increase comfort, be healthy, set a good example for children, be cool/trendy, help the country innovate, work together on a project, even save money. However, people generally don't buy efficient stoves, hybrid cars, or low-carbon-input food because they are cheap. People choose such products because they're cool, fit a lifestyle, have features that appeal – and because friends or acquaintances have such products (a primary reason for many purchases – see the Social Networks and Communication Principle).

Practical Advice for Program Design and Implementation: At its heart, this principle suggests making different and combined appeals. Ask people – staff at all levels – why they might get involved in sustainability activities. When they identify other benefits, whether synergies or tradeoffs, incorporate them into program design and communications. Design appeals that relate to the agency's mission, workplace comfort, convenience, special features (such as dashboard-type information) outside of energy efficiency, exercise programs, trendiness, setting a good example, or just "doing the right thing." Appeal to various motivations, preferably in combination.

Examples that Support this Principle: Military housing residents at the U.S. Marine Corps Air Station in Yuma reduced energy use without economic incentives (residents don't pay utility bills), and said that they wanted to (1) do the right thing, (2) set an example for their children, (3) show that the Marine Corps was the best military service, and (4) have comfortable homes. The U.S. Fish and Wildlife Service connected energy and water conservation efforts to the existing cultural values of the numerous naturalists who work at the agency. And the Center for Disease Control captured a connection to the agency's mission in the slogan, "Get green – get healthy!"

The Leadership Principle: Institutions and people change because the workplace rules change and visible leadership communicates management commitment.

Description: Active leadership, from both managers and other staff members, sends workplace groups the signal that sustainability is something they need to pay attention to, rather than shrugging off what could be seen as a diversion from the "real" work of the agency. Beyond merely "approving" the effort, high-level, well-respected individuals should personally champion sustainability. The involvement of a high-ranking person demonstrates the importance of the effort, as well as a top-down commitment. If written or public commitments are asked for, leaders should be among the first to make such commitments (see the Commitment Principle).

Practical Advice for Program Design and Implementation: In short, be visible and demonstrate commitment. Show up and follow up to demonstrate that your agency and workplace are serious about sustainability. Supervisors at every level need to be brought on board and given the motivation and tools (technical assistance, funding, analysis time) to address identified issues; these are important institutional investments.

Examples from the Literature that Support this Principle: At the Centers for Disease Control, the Director led stair walks on the building's open stairwell. David Guthrie at the U.S. Fish and Wildlife Service is an award-winning leader who designed a comprehensive program of energy efficiency, including data collection, a new role of energy managers, and stretch goals. Leadership from the U.S. Postal Service's Postmaster General is evident in public statements and a streamed video on the Lean Green Team home page, where team formation is an explicit goal.

The Commitment Principle: Institutions and people change when they have made definite commitments to change, especially when those commitments relate to future conditions.

Description: People who make commitments to do something tend to have higher rates of follow-through and success than people who don't, regardless of their favorable attitudes. This finding is widespread across social science research. A common weight-loss recommendation is to tell friends you are going on a diet; this proclamation helps externalize your goals and increases the likelihood that you will realize them. Numerous studies have demonstrated this principle for energy efficient behaviors. Without pre-commitments, people tend to procrastinate.

Practical Advice for Program Design and Implementation: Ask for specific commitments. For example, at staff meetings where sustainability goals and activities are discussed, hand out cards with wording that both ties into the workplace culture and invites the staff members to define their own behavioral changes or goals. Sample wording for a workplace where teamwork is valued and peer relationships are strong could be, "With my co-workers, I will adopt the following practices:" followed by several blank lines. Potential shared goals should be discussed in the meeting. New staff members can be asked to sign a statement that he or she will join the office's effort to become more sustainable (along with specific goals as applicable).

Examples from the Literature that Support this Principle: At the Department of Energy, the "Commit to Efficiency" program encourages federal employees to join their peers in specifying purchases of "green" products. The U.S. Postal Service's Lean Green Teams commit to doing projects that have very specific goals, where progress can be tracked at every level. U.S. Fish and Wildlife Service commitment to a vision of a building that embraces environmental stewardship on land that is steeped in history became a reality in the Assabet River National Wildlife Refuge (Sudbury, Massachusetts).

The Information and Feedback Principle: Institutions and people change because they receive actionable information and feedback.

Description: Comparison and even competition can be powerful motivators, as shown in several current programs that provide real-time feedback (on the internet) or comparisons on utility bills. These programs lower energy use. "Actionable information" means the opposite of the usual laundry lists of generic actions; instead, items must be implementable in the actual workplaces where they are suggested. That is, people must be able to see themselves taking those actions; if not, the result will be discouragement at best, tuning out of the whole program at worst.

Practical Advice for Program Design and Implementation: Provide tools and resources tailored to specific workplace situations. Energy use and savings should be made visible, thus providing goals and motives where they did not previously exist. Calculating facility, group, or individual carbon footprints can be engaging, empowering (see the Social Empowerment Principle), and effective. Other actionable information should include only those activities that can be implemented in the specific situations of workplaces.

Federal Workplace Examples that Support this Principle: The Navy's regional energy management team in its Region Southwest Metro San Diego Area compiles data from an extensive network of steam, electric, and gas meters and distributes straightforward reports with actionable information. The Department of Energy's Waste Isolation Pilot Plant altered its procurement system to require purchasers to provide a rationale for purchase of a non-compliant product, thus providing immediate feedback to the buyer and aggregate feedback to procurement policymakers about overall purchasing practices. Fort Irwin initiated Operation Battle Blackout, a voluntary program to reduce electricity; the immediate feedback on reductions helped avoid $1.7 million in energy costs from June to September, 2009.

The Infrastructure Principle: Institutions and people change because a changed infrastructure makes new behaviors easy and/or desirable.

Description: How building space is configured and how choices are presented make huge differences in people's behavior – and therefore in aligning that behavior with technologies and policies aimed at achieving agency sustainability goals. Examples: By presenting the more sustainable vegetarian option first instead of second for a conference meal, the November 2009 Behavior, Energy, and Climate Change conference saw many more people choose the vegetarian meal. When a company provides benefits for public transport but not for parking, more people use public transportation. The "defaults" of the physical environment can also either promote or impede energy-saving behavior. Characteristics of the built environment (e.g., whether a city is walkable) and technology (e.g., whether programmable thermostats are intuitive to use) can have a significant effect on behavior. Indoors, building managers deploying "adaptive comfort" processes (e.g., widening the designed temperature acceptability range and giving occupants leeway to adapt) see lower energy demand, higher staff satisfaction, and easier operation. For new equipment choices, when the Danish government persuaded its window manufacturers to present low-e windows first in their marketing materials, sales of low-e windows shot up.

Practical Advice for Program Design and Implementation: Change defaults (indoor temperature, printer settings, walkability of halls and stairwells, provisions for parking, etc.) and offer motivations as well as incentives to use infrastructure differently (e.g., special status/benefits for van pool and public transportation users). Check that such changes are effective. For example, when changing the default settings for the heating and air conditioning system, be sure to consult staff and readjust as necessary to avoid counterproductive behaviors like individual space heaters or fans. If possible, allow staff to adjust settings, which often leads to lower energy use and empowers staff. Identify, with staff input, what features of a work-at-home program, carpooling or public transport incentives would facilitate adoption. Make a plan to change/upgrade lighting and appliances to be more energy efficient.

Examples from the Literature that Support this Principle: The U.S. National Park Service ensured that energy-efficiency projects were constantly in the pipeline, so that, when different funding mechanisms became available, the Regional Energy Manager could take advantage of them. In a university building, interventions, including prompts and enhanced aesthetics, visibility, and accessibility of the stairwell, resulted in an 8.2% increase in total stair use that continued over the 4-week post-intervention period. The Department of Energy's Pacific Northwest National Laboratory equipped soft drink machines with a Vending Mi$er® that cuts power consumption up to 60 percent (a suggestion from a staff member).

The Social Empowerment Principle: Institutions and people who feel they can reach desirable social goals – often do.

Description: Daniel Pink, in *Drive*, draws on various well-established social science research to show that workers are not motivated by sticks and carrots but by three desires: autonomy, (people want to have control over their work), mastery (people want to get better at what they do), and purpose (people want to be part of something that is bigger than they are). Appealing to these motivations will be far more effective than putting in place rules and sanctions and/or prizes for the best energy-efficient or sustainability performance.

Practical Advice for Program Design and Implementation: Involve people in program design and processes. Identify which categories of people are essential to program success and consult with them throughout program design and implementation processes.

Examples that Support this Principle: U.S. Postal Service's Lean Green Team projects deliberately are planned with no or limited resources – so the teams know they can move forward and implement them. The Marine Corps Air Station at Beaufort created a "can-do" working group that includes all energy stakeholders, such as building occupants, site planners, maintenance staff, architects, and engineers to develop energy conservation goals and strategies. The monitoring and evaluation process for the Air Force's Air Mobility Command includes air crews, planners, maintainers, and logisticians.

The Continuous Change Principle: Institutional change takes time.

Description: The organizational change literature emphasizes that change management efforts often fail because the change is not sustained. The key to achieving and sustaining significant change is altering the basic ways of thinking within the organization, something that is difficult to achieve and sustain; a shift to sustainability values and practices might not rise to the "major transformative" level, but it must be considered a multi-year process. Changes should be "baked into" the organization so that, over time, sustainability is integrated into formal and informal standard operating procedures.

Practical Advice for Program Design and Implementation: Plan from the beginning for a multi-year process, with activities that can be implemented now and others that are planned for the coming years (kick-off events *plus* follow-on activities; sustainability training for current employees *plus* as standardized components of new employee orientations). Seek staff input at regular intervals about what they are doing and how to increase sustainability.

Examples from the Literature that Support this Principle: The U.S. Marine Corps Beaufort's standard operating procedure

now requires facility architects and engineers to address energy efficiency in all facility designs and specifications. The U.S. Air Force's Air Mobility Command has built in the process of continuously seeking fuel-saving ideas by creating a governance structure and tying it to the existing corporate structure. The Department of Energy Waste Isolation Pilot Plant has institutionalized its sustainability program in an Environmental Management System.

Conclusions

Efforts to build sustainability will succeed only to the degree that agencies and others adopt strategies that integrate technology and institutional changes, especially in programs to reduce energy use. Our review of the literature has shown that efficient and sustainable institutional and individual behaviors persist in organizations when they are supported by the culture and infrastructure of those organizations. These principles provide an approach, not a checklist, for agencies to develop a process that ensures the goals of sustainability become a part of the fabric of their agency's mission, work, and everyday activities. Unless energy efficiency and sustainability are "the way we do business," they are at risk of being short-lived and ineffective.

For more information on these principles and the work of the FEMP Institutional Change Team to sustainable institutional change, see https://sites.google.com/a/lbl.gov/institutional-sustainability--public-site/home.

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