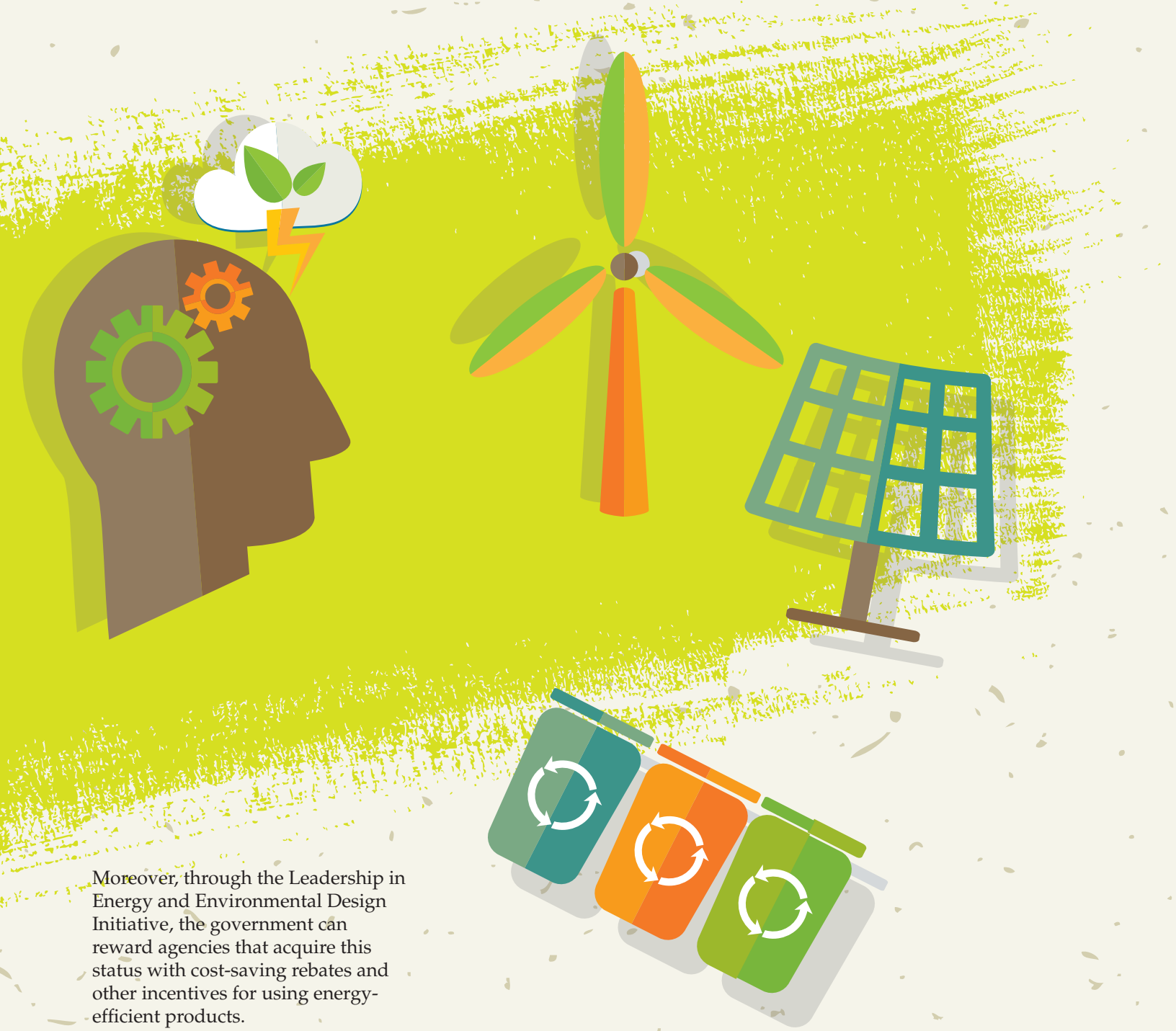
PAINTING CORRECTIONAL INSTITUTIONS GREEN:

How Using Green Technology Can Reduce Correctional Institution Costs

Doris Wells

With prison costs steadily rising and State budgets being cut, correctional institutions are seeking ways to reduce costs. Based on an NIJ-funded research analysis through its Corrections Technology Center of Excellence (one of the National Law Enforcement and Corrections Technology Centers) the *Greening Corrections Technology Guidebook*[1] shows that many energy-efficient devices and procedures (green technologies and systems) can reduce correctional institutions' costs. As a result, many government and commercial agencies, including correctional institutions, are installing and implementing energy efficient devices as cost-saving measures.



Moreover, through the Leadership in Energy and Environmental Design Initiative, the government can reward agencies that acquire this status with cost-saving rebates and other incentives for using energy-efficient products.

The *Greening Corrections Technology Guidebook* provides correctional administrators with a comprehensive and informative discussion of how green technologies can reduce their operating costs. It reviews green technologies' rapidly increasing role as a cost-effective measure in correctional institutions, and presents the challenges and issues to consider during acquisition and implementation (each technology must be carefully evaluated for appropriateness and affordability).

Guiding Principles and Focus Areas

Public safety, staff security, and economic stability are the basic guiding principles behind the guidebook's review of and guidance on using green technology. It discusses the importance of forming a "green team" and describes six basic areas where using green technologies can produce significant cost savings. It also indicates that a secondary cost-saving aspect of implementing green technology is the employment opportunity it can create for inmates through training. Teaching inmates how to install and use green technology can keep money in-house and equip them with skills for future employment upon their release from prison. Such employment could help them avoid recidivism, further contributing to correctional costs.

IN AN EFFORT TO REDUCE COSTS, INSTITUTIONS NEED TO IDENTIFY NEW ENERGY SOURCES AND INCREASE ENERGY EFFICIENCY.

Whether driven by an official mandate or the desire to help reduce costs at an institution, the guidebook's authors found it critical for green technology advocates to first get support (concept and resources) from senior management. Next, advocates should create a green team—a group of correctional staff, including administrators, engineers, architects, project managers, supervisors, etc.—who still retain their regular responsibilities, but have been authorized to lead or explore green initiatives. In addition to having a strong commitment from senior management, institutions should have formal mechanisms in place to select, implement, and evaluate the impact of green technologies. As part of the evaluation, institutions should strongly consider developing an inmate vocational training component as part of their program. Such an initiative can provide the labor necessary to manufacture, install, and maintain green technologies, and also transfer a marketable skill for inmates who are released or who are on parole and seeking employment.

Six Basic Cost-Saving Areas

The guidebook's authors selected lighting; heating, ventilation, and air conditioning (HVAC) systems; plug-in appliances; materials flow; water; and energy as the six areas where correctional institutions can obtain the greatest cost savings from using green technology.

Lighting. Many institutions can save money by using more cost-efficient lighting technologies, such as advanced fluorescent (including induction) lights that are capable of efficiency levels 40 percent better than their earlier fluorescent counterparts. Some models function for up to 100,000 hours. Other cost-efficient lighting technologies include:

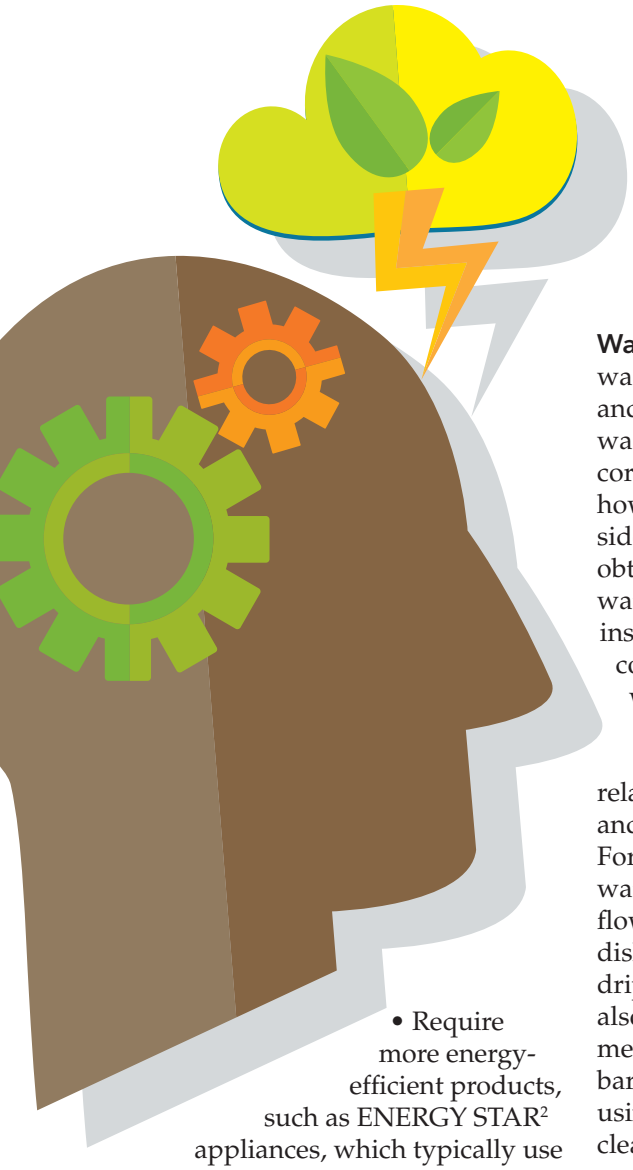
- Daylighting (windows, skylights, and SunTubes): Techniques used to allow natural light into the institution and reduce electrical consumption; and
- Movement and occupancy sensors: Automatic sensors that can be installed to detect occupancy of an area through infrared, sound or other technology, then automatically turn lights on or off, saving significant amounts of electricity.

HVAC Systems. The maintenance of HVAC systems, which play a critical role in the health and safety of an institution, is a significant operating expense. Properly maintained HVAC systems can mitigate the risk of the spread of infectious diseases by improving indoor air quality and preventing the spread of allergens, spores, bacteria, and viruses, which can add to the operating costs through healthcare costs and employee health-related absenteeism. In the past, energy sources that were used to heat, cool, and ventilate buildings were relatively inexpensive, so little thought was given to alternative forms of energy during building construction. However, correctional institutions worldwide have now recognized the value of reducing costs, improving health and increasing comfort by heating and cooling buildings more efficiently. The guidebook discusses some of the basic technologies and techniques available to accomplish this task as follows:

- Insulating walls, attics, and floors;
- Plugging leaks and sealing ducts;
- Conducting periodic maintenance and tune-ups;
- Using VariableAirValve and multizone heating and cooling systems;
- Upgrading HVAC equipment;
- Installing more efficient or tankless "demand" water heaters; and
- Reducing heat islands in parking lots.

Plug-in appliances (including pumps and motors). Institutions can save money by improving the electrical efficiency of the appliance or technology, or by turning the technology off. The following could save facilities money:

- Turn off unnecessary lights or devices such as radios, TVs, copiers, etc.;
- Use "smart" power strips for computer workstations;
- Reengineer systems such as sewage or water treatment facilities, or prison industries that use large amounts of electricity for pumps or motors; and



• Require more energy-efficient products, such as ENERGY STAR[2] appliances, which typically use more than 25 percent less energy than noncompliant devices. For example, older, less efficient cathode ray tube TVs draw 35 to 50 watts, but more efficient TVs use 15 to 25 watts.

Materials flow (including recycling and toxics). The guidebook's authors consider any material that is not put to use in an institution as waste, so they urge institutions to reuse, recycle, and compost materials. In addition, they recommend creating a green cleaning program—one with safer, less-toxic solutions that act as deterrents to mold, viruses, bacteria and allergens. Reducing toxic substances and providing a healthy environment can reduce healthcare costs for inmates and staff. Recycling reduces costs for waste disposal and can be the focus of vocational training opportunities for inmates to acquire skills that can be used at the institution to reduce the cost of outside help, or for future employment after release from prison.

Water. In the past, when fresh water was in abundance and purification and sanitation costs were low, water was not a significant expense for correctional institutions. Recently, however, there has been a considerable increase in the costs of obtaining, treating, and distributing water, and many large correctional institutions are now required to construct and maintain their own water purification and wastewater treatment plants. Thus, any savings in water use or water-related energy use reduces waste and provides institutional savings. For example, institutions should use water-efficient devices such as low-flow shower heads, toilets, urinals, dishwashers, lawn sprinklers and drip-irrigation systems. They should also employ other techniques and methods such as using cisterns and barrels to capture rainwater and using rain gardens and swales to cleanse, filtrate, and slow run-off water.

Energy (including transportation). In an effort to reduce costs, institutions need to identify new energy sources and increase energy efficiency. They should establish a funding source to justify efficiency improvements and, if feasible, provide affordable energy from local and renewable sources such as wind, water, and sun. Many correctional institutions are steadily adding renewable energy facilities to process solar, wind, biomass, and geothermal forms of energy that are proving to be cost-effective means of providing clean, renewable electricity and heat. However, when contemplating renewable forms of energy, consider installation cost and suitability/location of the site to ensure such a decision is cost-effective.

Conclusion

The guidebook is replete with examples that support the cost savings from the use of many green technologies at various departments of correction, Web links that connect to additional supporting data, and short case studies of success stories. Appendix 1 details several financing mechanisms that various institutions and agencies have used to provide funding for implementation and training for various technologies discussed, and Appendix 2 presents the complex issues involved in selecting and implementing one particular green technology. ■

Footnotes

1. Sheldon, P.M. & Atherton, E. (2011). *Greening corrections technology guidebook*. Washington, D.C.: Corrections Technology Center of Excellence, the National Law Enforcement and Corrections Technology Center, U.S. Department of Justice, National Institute of Justice. Retrieved from www.justnet.org/pdf/Greening-Corrections-Technology-Guidebook-final-0229.pdf
2. The U.S. Department of Energy and the Environmental Protection Agency joined together to offer the ENERGY STAR Program, which certifies a wide variety of technologies and provides resources and rebates. Please note that providing information on law enforcement and corrections technology or the mention of specific manufacturers, products or resources does not constitute the endorsement of the U.S. Department of Justice.

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