



The Greening of Corrections

Creating a Sustainable System



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Message from the Director

Today, with the increase in the prison population combined with the rising costs of protecting public safety and rehabilitating prisoners, correctional leaders across the country are challenged with operating at maximum efficiency to provide quality services in a time of limited resources. These challenges range from rising energy costs, increased water use and food, to the provision of education and training for prisoners to help them successfully transition into their communities. While many of these challenges may seem daunting, we believe some of the most innovative and greatest cost savings solutions can be found in the greening of corrections.

Increasingly, correctional professionals are evaluating the long-term impacts of corrections buildings, operations, and programs on the environment, community, and economy, and are establishing sustainability plans and green practices regarding resource consumption; vehicle use; purchase of goods and services; facility construction, operation and maintenance; and the education and training of prisoners. The benefits of greening correctional facilities are both short and long term; they will consume fewer resources, create less pollution, and provide healthier environments for the users – inmates, staff, visitors, and administration. A sustainable model of corrections also goes beyond facilities and operations and should be tied to a comprehensive strategy that provides access to viable hands-on training and job opportunities for inmates to reduce recidivism and influence them to become productive citizens in an emerging green economy.

To assist the corrections field in moving towards a more holistic and sustainable approach, the National Institute of Corrections commissioned this publication, *The Greening of Corrections: Creating a Sustainable System*, with the goal of helping correctional professionals understand how to: 1) build or transform correctional agencies into self-sustaining facilities, 2) identify green job training programs and jobs for prisoners that provide quality employment opportunities in the emerging green economy, and 3) make prison industry products, jobs, and services more environmentally friendly.

The Greening of Corrections publication provides correctional professionals with a framework to gain a general understanding of sustainability practices and principles and to identify examples of innovative and practical applications of operations, programs, and management strategies for self-sustaining facilities. The publication highlights recommendations on how to get started and provides a range of examples from upgrading existing correctional facilities with more efficient lighting, heating, and cooling systems to recycling food waste and organic gardening to a more ambitious and visionary example using a Net Zero buildings model, with net zero carbon emissions, energy use, and waste production. We hope that this information will help jumpstart your sustainability efforts at your facilities. In addition, the publication offers helpful information on the “greening of occupations,” promising sectors that are more open to hiring individuals with criminal records, and a summary of environmental literacy curricula that could prove useful when implementing new or adapting existing green education and training programs.

We believe the path to sustainability is not only technically feasible for correctional facilities but also critical as it allows us to reduce our costs of doing business, assist in making our communities more sustainable, help our inmates reintegrate into society in a productive and meaningful way, and ultimately, ensure that we are preserving our environment now and for generations to come.

“While many of these challenges may seem daunting, we believe some of the most innovative and cost savings solutions can be found in the greening of corrections.”

Morris L. Thigpen
Director
National Institute of Corrections

INTRODUCTION

Although the primary goal of corrections is safety for the community and for those housed and working within the facilities, increasingly, sustainability goals and strategies are being integrated into policies and plans within the corrections community. Accordingly, more and more leaders within corrections are evaluating the long-term impacts of its buildings, operations, and programs on the environment, community, and economy, and are making decisions on management, resource allocation, and programming based on green principles and practices. The greening of corrections provides an extraordinary opportunity to create more efficient, resilient, and sustainable prisons and jails, with benefits that include reducing the financial and human capital costs of prisons through reduced energy and resource consumption and engaging inmates in hands-on work experiences and education and training to prepare them for jobs in the emerging green economy.

To assist the corrections field in moving towards a more holistic and sustainable approach, the U.S. Department of Justice, Federal Bureau of Prisons National Institute of Corrections, commissioned the Academy for Educational Development (AED) and its partners, RicciGreene Associates, John Jay College of Criminal Justice Prisoner Reentry Institute, The Corps Network, and Dr. Raquel Pinderhughes to write this paper with the goal of helping correctional professionals understand how to: 1) build or transform correctional agencies into self-sustaining, innovative

facilities, 2) identify green job training programs and jobs that provide viable employment opportunities in the emerging green economy for individuals in correctional facilities and those reentering communities, and 3) make prison industry products, jobs, and services more environmentally friendly. This paper seeks to lay out the current landscape of green education and training programs and correctional industries through surveys conducted with members of the Association of State Correctional Administrators (ASCA) and the National Correctional Industries Association (NCIA) and two focus groups conducted at the NCIA Annual Conference.

"The information in this paper is not meant to be exhaustive, particularly since sustainability practices, production of green goods and services, and green education and training programs are constantly evolving as new green processes, materials, and technologies come to market. Instead, the greening of corrections paper serves as a starting point for the corrections field by providing both a general understanding of sustainability practices and principles and by identifying examples of innovative and practical applications of operations, programs, and management strategies for self-sustaining facilities."

This paper will examine the current tools, strategies, and practices of sustainability activities within

correctional facilities and provide basic information and recommendations to practitioners in applying this knowledge to their own facilities. The summary of current research, strategies, and practices is broken into five distinct sections focused on: 1) the greening of correctional facilities and their operations, 2) the education and training of inmates to prepare for

reentry including environmental literacy, 3) the current landscape of the greening of correctional industries through processes, products, and partnerships, 4) the greening of reentry programs, and 5) recommendations and “how-to” guidance for correctional facility staff in implementing sustainability practices and programs and leadership, ranging in complexity and investment.





Photo provided by Rhode Island Department of Corrections

A close-up photograph showing a person's legs and hands as they install dark blue solar panels onto a light-colored metal roof. The panels are arranged in a grid pattern.

GREENING OF CORRECTIONAL FACILITIES

Traditional practice in correctional facility design and operations has used programs and techniques that could well be termed “sustainable,” but would benefit from an overarching vision that connects these activities with the greater goal of contributing to the sustainability of our society. The green or sustainability movement has gained acceptance because it proposes that we examine our activities for ways to reduce their impact on the natural world. The current patterns of human activity, often wasteful of resources, toxic to habitat, water, and air and demeaning to the human spirit are undergoing an examination in many areas to find ways to make them more harmonious with the natural world, the better to provide for our continued existence. Because of the degree of order and control of human behavior, the need to create productive activities, and opportunities to reduce the economic burden placed on society, correctional facilities represent an attractive “living laboratory” environment for self-sustaining facilities. The current view of sustainability through a correctional field perspective is that a triple bottom line of “3 E’s” must be pursued in balance:^{1, 2}

Environment - in reducing negative impact, often expressed as the carbon footprint, but also including pollution and waste stream reduction, of the buildings on their environment.

Economic - in reducing costs over the lifetime of the buildings. This might also include the opportunity for revenue-generating activities.

Equity - in targeting programs that will increase the possibility of redirecting or “correcting” the behavior of the individuals whose activities have resulted in their incarceration. This would have benefits for the individual, for their families, and for the communities impacted either positively by successful reentry or negatively, if the released offender commits another crime.

With buildings that are environmentally friendly, low in operating cost, pollution, and waste, and with green programs that result in desirable products and a workforce trained in high demand job skills, the correctional facility may be an ideal case for organizing around these three tenets of sustainability as it can be viewed as a microcosm of society. With a properly trained and motivated staff, a cooperative relationship between communities and strategic partners, and a proactive mobilization of the human resources available in the sentenced population, a holistic and sustainable system can be achieved.



“The current view of sustainability through a correctional field perspective is that a triple bottom line of ‘3 E’s’ must be pursued in balance...”

Where to Begin: What Is a Green Building?

From a sustainability standpoint, correctional facilities are 24-hour energy intensive structures that focus on security, with most existing building stock constructed with little regard to efficient lighting, heating, and cooling. New models for building design and existing building retrofits have emerged that focus on energy efficiency and conservation. This has been driven mainly by federal and state policies and the desire for cost savings in a time of fiscal restraint. The benefit of greening correctional facilities is that they will consume fewer resources, create less pollution, and provide healthier environments for the users – inmates, staff, visitors, and administration.

Generally, the key features of green building are:

- Site development that encourages mass transit use and renews land
- Buildings that are low energy/resource consumption
- Processes that minimize waste and create healthy byproducts
- Healthful interior environments that enhance productivity
- Construction using materials that are local, renewable, recycled, and recyclable

Green buildings are those planned, designed, constructed and operated in harmony with nature, with as little impact as possible on the natural environment. There are numerous ways to quantify the “greenness” of a building and the next two sections will highlight two of them - Leadership in Energy and Environmental Design (LEED) and Energy Star.³ Energy Star is designed to measure a building’s performance, create practical operating benchmarks/goals for energy use, and help monitor energy efficiency. The focus of Energy Star is energy use reduction. LEED, on the other hand, is a much broader approach encompassing “people, planet, and profit.” The “triple bottom line” takes into account economic, environmental, and social equity issues throughout the entire building process from concept to design, construction and operations. (See <http://www.green-buildings.com/content/78308-leed-vs-energy-star>.) Both are the acknowledged benchmarks nationally - which can help correctional facility operators seek a pathway to making existing or new facilities more sustainable.

LEED Rating System and Justice Facilities

The LEED process provides a yardstick for defining a green building and therefore, correctional facilities must have an understanding of the rating system. Developed by the U.S. Green Building Council (USGBC), LEED has accelerated the trend towards



energy efficiency and is the benchmark in North America for evaluating the relative sustainability or “greenness” of buildings. Within LEED, there are alternative “scorecards” that respond precisely to the basis of a construction project, i.e. new construction (LEED-NC), renovation on existing buildings (LEED-EB), and interior construction (LEED-IC). A recent innovation by the USGBC is the notion of an “overlay” to the base scoring templates to recognize the different baseline characteristics of building types whose sustainability profiles vary significantly from the generic office building model used as the LEED standard. Because correctional and detention facilities do not fit the typical profile of generic office buildings, a LEED/Justice (LEED-J) overlay template has been proposed, which would weight certain categories differently than the standard model, and perhaps adopt different or additional prerequisites. The precedent for this concept has been established by the Green Health Care Initiative with an overlay template for health facilities. Ongoing dialogue between the American Institute of Architects (AIA) and the USGBC suggests that this concept could be extended to detention and correctional facilities, and the formation of a Technical Assistance Group (TAG) to prepare the detention/correctional facility overlay template is underway.

The LEED-EB can be used as a tool to evaluate existing detention and correctional facilities to assess their relative greenness. The current status of the building can be scored, and the relative benefits of alternative greening measures evaluated for their potential to achieve greater sustainability. In the current version of LEED, LEED v.3, there are seven major categories where points are earned:⁴

Sustainable Sites*	26 points possible
Water Efficiency*	10 points possible
Energy and Atmosphere*	35 points possible
Materials and Resources*	14 points possible
Indoor Environmental Quality*	15 points possible
Innovation and Design Process	6 points possible
Regional Priority Points	4 points possible
TOTAL Possible:	110

Impact of State Mandates on Correctional Facility Operations

More and more state governments are passing legislation to create standards for energy efficiency, solid waste reduction, and renewable energy. While these standards or “mandates” have an impact on all state agencies, departments of corrections are affected in different ways. States are also taking different approaches to addressing energy efficiency (i.e., reducing energy consumption) and solid waste reduction. For example, some states like Alabama, Kentucky, and Tennessee are requiring specific reductions in energy consumption and waste over time. Other states, including Arizona and Utah, take a more holistic approach, addressing energy efficiency, solid waste reduction and other green building practices together by requiring all new buildings to be LEED certified.⁶ Some state departments of corrections view these new requirements as a way to save money, limit the negative impact on the environment, and become innovators in the field. Consider two examples:

ENERGY EFFICIENCY:

In 2002, the Florida Department of Corrections (DOC) was challenged to reduce its sky-rocketing energy costs. Staff worked closely with Florida Power & Lighting Company (FPL) to update a variety of systems while not threatening inmate security. These measures included installing high efficiency lighting, updating water fixtures, water conservation and control measures, more efficient air conditioning, and eliminating aging steam laundry and cooking systems. In the first year

Each of the starred (*) categories has prerequisites that do not have points available, but which must be met before any points can be earned in that category. The Energy and Atmosphere category has the greatest number of points available. The point totals necessary to earn a LEED Certification are:⁵

Certified	40 points possible
Silver	50 points possible
Gold	60 points possible
Platinum	110 points possible

alone, the Florida DOC saved almost \$900,000.⁷ Since implementing the original measures, the Florida DOC has worked closely with FPL to implement other energy innovations. For example, in 2007, FPL and partners debuted a microturbine generator at the Tomoka Correctional Institution in Daytona Beach. When the governor signed executive orders to reduce greenhouse gas emissions, in 2007, all state agencies had to implement new strategies for energy efficiency and require all new buildings be LEED certified. As a result of earlier upgrades, the mandates had limited impact on the Florida DOC.

SOLID WASTE REDUCTION:

In 1991, the state of South Carolina passed a comprehensive law regulating solid waste management and setting waste reduction and recycling goals. The South Carolina Department of Corrections (SCDC) worked with 50 other state agencies for the initial implementation. By 2004, SCDC had diverted 50 percent of its solid waste from landfills annually. By 2009, recycling cost avoidance/savings were estimated at \$540,042 annually.⁸ Today, SCDC treats waste reduction and recycling as a management practice, not a state mandate. Prison industries teach inmates how to recycle and upgrade donated computers for distribution to school districts. Some correctional facilities support local recycling centers. In fact, in past years SCDC recycling centers have received awards for excellence.

Innovations in LEED v.3 include greater emphasis on the Energy and Atmosphere category and the introduction of Regional Priority Credits to make the scorecard more sensitive to local climate and context. The operational profiles of detention and correctional facilities are distinct, and perhaps closest to that of a hospital facility, which has densely occupied 24/7 mission critical facilities consuming greater energy on an annual basis than do typical commercial or residential buildings. In addition, many correctional facilities consume far greater amounts of water per

square foot than do standard building types. Finally, the need for security and robust construction makes otherwise simple glazing and daylighting (the practice of placing windows or other openings and reflective surfaces so that during the day natural light provides effective internal lighting) criteria significant cost challenges in the detention/corrections building. To address these concerns, the USGBC has instituted a program of Credit Interpretation Requests (CIR) that help designers and owners obtain guidance about conditions specific to their projects that differ from

the mainstream. The responses to the CIR are maintained at the USGBC and are available to designers working on subsequent projects. There are numerous detention/corrections projects that have gone through this process, and the CIR responses are great resources for future projects. These CIRs and rulings can be found at www.usgbc.org.

Correctional facility operators seeking a pathway toward more sustainable facilities would do well to use the LEED-EB tool as the starting point in the process. Many points are easily achievable if the

California Department of Corrections and Rehabilitation

The State of California suffers from particularly high energy costs and instability within its energy supply. In fact, the state is often plagued with rolling brownouts (scheduled reductions in available voltage to a region) and has experienced large-scale blackouts in the past decade. As a result, each state agency has taken drastic action in reducing energy consumption and costs. The California Department of Corrections and Rehabilitation (CDCR) has experienced substantial savings as a result of some of their energy efficiency measures. In 2008 alone, the California DCR saved more than \$3 million.

CDCR Energy Savings Projects (Phase I) 2008

Facility	Project Description	Annual Savings (\$)
Valley State Prison for Women	Lighting improvements, kitchen equipment upgrade, laundry improvements	174,954.56
Central California Women's Facility	WWTP aerator improvements	78,801.16
Pleasant Valley state prison	WWTP aerator improvements, motor controls various lighting retrofits	174,334.13
Wasco State Prison	HVAC control, housing unit fan VFDs various lighting retrofits	178,716.06
Corcoran State Prison	Energy management control systems	369,942.51
Mule Creek State Prison	Housing unit fan VFDs	234,487.35
CSP Los Angeles County	Refrigeration controls, various lighting retrofits HVAC controls	185,918.44
Ironwood State Prison	Housing unit fan VFDs	236,158.23
California Correctional Institution	Lighting improvements, boiler retrofit	466,121.44
RJ Donovan	Laundry upgrades, various lighting retrofits	166,266.72
California Training Facility	Motor upgrades, lift station VFD, various lighting retrofits	158,765.62
California Institution for Women	Lighting retrofit, HVAC control	99,884.56
Major Lighting Retrofit Projects		
Corcoran State Prison	Facility wide interior lighting retrofit	163,035.50
Mule Creek State Prison	Facility wide interior lighting retrofit	121,309.76
North Kern State Prison	Facility wide interior lighting retrofit	150,156.09
CSP Los Angeles County	Facility wide interior lighting retrofit	234,362.63
Total		3,189,214.73



location of the building is advantageous (e.g., with access to mass transit). Some points will be achievable with simple adjustments to operating procedures (introducing recycling and composting programs). Many of the points will require capital investment to achieve, particularly in the Energy and Atmosphere category. These are the points that have direct payback, with energy cost savings paying for the investment in increased insulation/weatherization, more efficient systems, and even renewable energy systems. Because the energy consumption in a correctional facility is so great, the payback for renewable energy sources such as photovoltaic panels and solar cooling/heating is far more advantageous than for less intensively used buildings.

Design of a correctional facility, whether prison or jail, to achieve a LEED certification is a technically challenging matter and a considerable achievement. Aside from cultural institutional impediments, limited budgets, and a low maintenance imperative, the rating system itself is calibrated for more mainstream building types, not the high use/abuse 24/7 operations characteristic of the correctional facility. Developing appropriate benchmarks for energy and water consumption and a base of sustainable strategies for day-lighting, innovation credits and appropriate prerequisites is an essential area of negotiation with the USGBC that is now in its initial stages for the LEED-J template.

With the introduction of the new LEED v.3, with an increased emphasis on energy savings, and the opportunity to gain bonus points for location-specific credits, the opportunity for achieving certification has improved. Nevertheless the weak points of the correctional building type energy loss through single glazed steel window frames, insufficient wall insulation, and inadequate local control of energy can be addressed through emerging building component technology and the incentives represented by the LEED v.3 scoring system. The now commonplace requirement that new buildings be LEED certified or better, and that existing buildings be retrofitted to achieve the Existing Building (EB) certification, is a powerful incentive to leverage the long term savings that these designations represent.

Energy Star Program and Energy Management Assessment

For building operators not concerned with the full scope of the LEED analysis and its seven categories of rating, most of which do not address operating costs, the Energy Star program may be a simpler and more focused way of performing an initial evaluation of the building's energy performance in comparison to benchmarks of model buildings.³ Energy Star is a joint program of the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE) designed to bolster environmental protection and energy savings through energy efficient products and practices. (See http://www.energystar.gov/index.cfm?c=about.ab_index)

Energy Star was created by the EPA in 1992 and provides building owners with strategic energy management plans designed to benefit both the environment, by reducing the 15 percent of greenhouse gases attributable to buildings, and the owner's bottom line.³ The policies of Energy Star are designed to overcome what the EPA/DOE describe as market barriers (i.e. lack of information and split incentives) to the adoption of cost-effective energy efficiency products and services. See <http://www.green-buildings.com/content/78308-leed-vs-energy-star> for more information.

Buildings and Energy Star

Energy Star offers building owners a straightforward way to adopt superior energy management and a way to realize the cost savings and environmental benefits that can result. EPA promotes a strategy that starts with the organization's top leadership, engages staff throughout the organization, and uses standardized measurement tools to help an organization get the most from its energy efficiency investments. EPA seeks to develop partnerships across the commercial and industrial sectors to facilitate the development of best practices and information sharing. While EPA will partner with any interested organization, special focus

has been placed on those sectors for which EPA has been able to develop new standardized measurement tools. These sectors include commercial real estate, public buildings, schools (K-12), higher education, healthcare, hospitality, automobile manufacturing, cement manufacturing, wet corn milling, and others.

Through its work with thousands of partners in Energy Star, EPA has identified the key elements of superior energy management. They are:

- Top-level commitment to reduce energy waste. Without this commitment, resources are often not allocated to energy projects, and efficiency programs are not sustained.
- Routine assessment of organization-wide performance against competitors and across one's own portfolio. Assessing energy use in all operations and all buildings results in resources being targeted to those facilities with the greatest potential for improvement. Organizations can rank their own properties, learn from the high performers, and upgrade the poor performers.
- Use of a systems-integrated approach to upgrade buildings. Sizing heating and cooling equipment, integrating individual technical components, and controlling, operating, and maintaining equipment play a big role in the energy performance of a building.

Distinguishing the top performing buildings based on results from the national energy performance rating system, EPA offers the Energy Star label as a way to distinguish buildings that are top energy performers - those scoring in the top 25 percent - which also meet industry standards for indoor air quality.⁹ The following are some quick facts about Energy Star:

- Thousands of organizations have applied for the Energy Star and by the end of 2002, 1,100 top performing buildings nationwide had earned the prestigious label.
- As a group, Energy Star qualifying buildings use 40 percent less energy than the average building in the United States, while providing quality space.

- EPA will continue to offer the Energy Star label for top performing buildings and work with organizations to help them highlight the design, operations, and maintenance features that make the buildings qualify.
- EPA is collaborating with leaders in the Green Buildings Industry to ensure that similar approaches are used to recognize top energy performing buildings in the Energy Star program as are used for LEED certification.

Rate Your Building's Energy Performance

The national energy performance rating is an external benchmark that helps energy managers assess how efficiently their buildings use energy relative to similar buildings nationwide. The rating system's 1-100 scale allows everyone to quickly understand how a building is performing — a rating of 50 indicates average energy performance, while a rating of 75 or better indicates top performance. Using the Energy Star Portfolio Manager, statistically representative models are used to compare your building against similar buildings from a national survey conducted by the Department of Energy's Energy Information Administration.¹⁰ This national survey, known as the Commercial Building Energy Consumption Survey (CBECS), is conducted every four years, and gathers data on building characteristics and energy use from thousands of buildings across the United States. Your building's peer group of comparison is those buildings in the CBECS survey that have similar building and operating characteristics. For more information, visit the Department of Energy website dedicated to CBECS at <http://www.eia.doe.gov/emeu/cbeics/>.

EPA, in conjunction with stakeholders, developed the Energy Star rating as a screening tool; it does not by itself explain why a building performs a certain way, or how to change the building's performance. It does, however, help organizations assess performance and identify those buildings that offer the best opportunities for improvement and recognition.

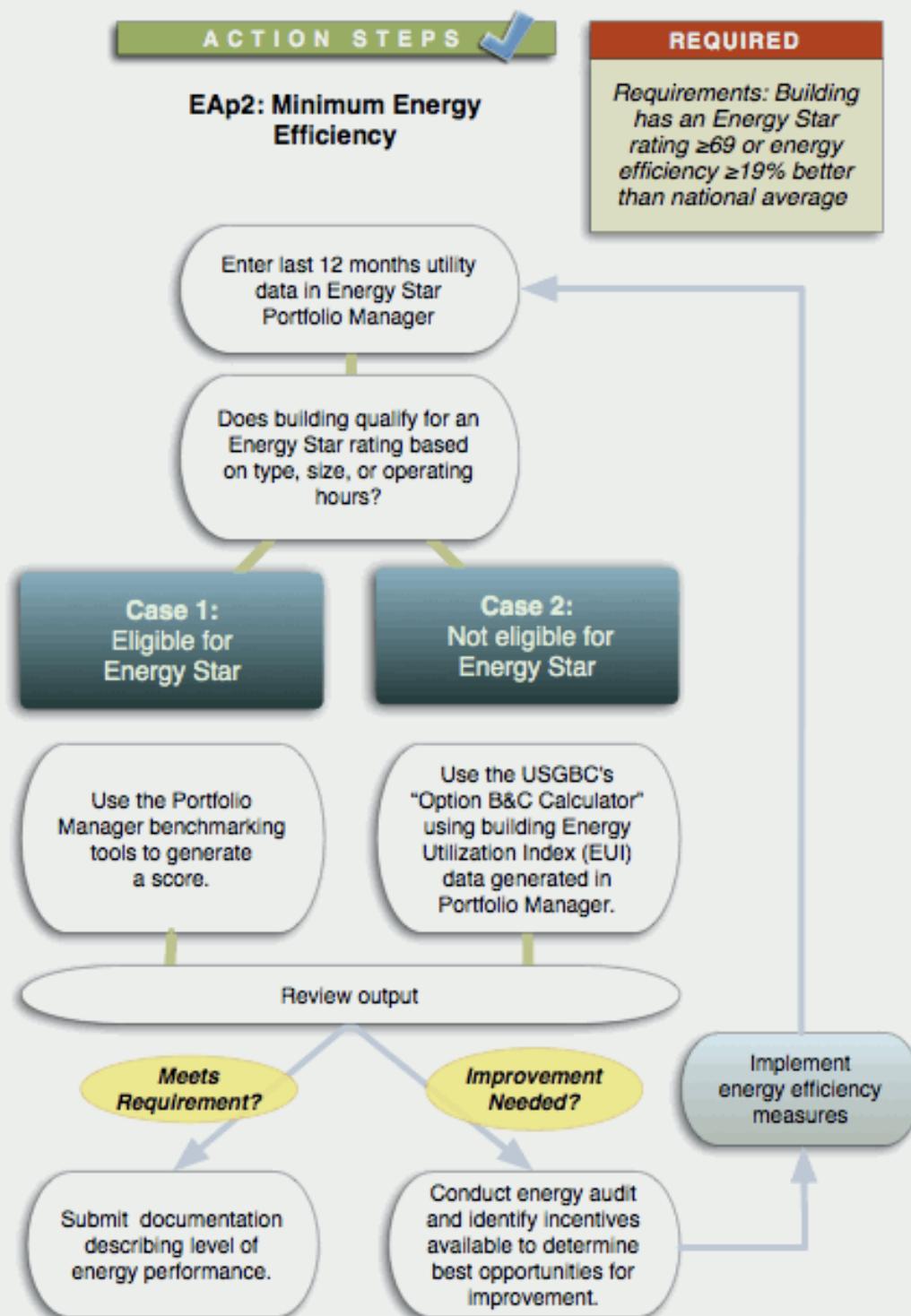


Diagram excerpted from LEED user EBOM 2009 EAp2: Minimum Energy Efficiency Performance.¹¹

The diagram on page 7 explains the Energy Star rating process, illustrating the parallel processes for projects that fit the eligibility criteria directly, and for those that are not eligible, but which can benefit from the analysis.

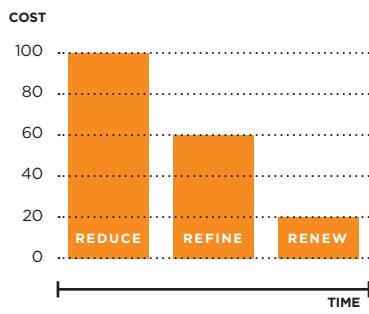
How the Rating System Works

While there is no benchmark standard for the rating of correctional facilities, energy managers are able to use similar building types as a benchmark. Hospitals, like correctional institutions, operate round-the-clock and house people in staff intensive settings and are good candidates for use as benchmarks, as are other recently completed buildings designed according to sustainable principles. While there is a need for a corrections specific benchmark to simplify this evaluation process, the current process is available and is a valid indicator of the energy performance of an existing building.

Correctional institutions can still be recognized by the EPA for energy reduction contributions. In 2009, for example, Massachusetts' Bridgewater Correctional Complex was presented with an Energy Star "Combined Heat and Power" award for using highly efficient co-generation systems to save energy, lower greenhouse gas emissions and reduce air pollution.¹² Combined Heat and Power (CHP) generation is "the simultaneous production of electricity and heat from a single fuel source, such as natural gas, biomass, biogas, coal, waste heat or oil. CHP is not a single technology, but an integrated energy system that can be modified depending upon the needs of the energy user."¹²

Understanding the essential elements and benchmarks for green building and operational standards is critical and, more importantly, so is transitioning from understanding to action. The next section of this paper will highlight how to turn knowledge into action through a variety of cost-savings strategies.

Energy Reduction Strategy



How Do I Start? Cost-Effective Strategies for Sustainable Correctional Facilities

There is a demonstrated body of knowledge around the business case for various sustainability strategies for correctional facilities. These include: clear short-and long-term returns on investment, mitigation of the uncertainty of future energy costs and supply, and the provision of education and training opportunities for inmates that will result in marketable skills for the current or future labor market. Strategies begin with three ways of reducing the energy consumption and cost as illustrated in the diagram to the left.

The application of cost savings strategies for a detention/correctional facility can take into account the unique advantages of the controlled environment where policies can be implemented by professional staff, an available and willing labor pool for labor-intensive operations, and green job training programs that can be designed to build on and benefit from these strategies. The following are five proven cost savings strategies; the first three focus on reducing energy

Ironwood State Prison and California Energy Savings



Photograph provided by California Dept. of Correction and Rehabilitation

Every state is facing the reality of shrinking budgets, increased energy costs and potential energy shortages—perhaps none more than California. As a result, the state has taken drastic efforts to reduce energy consumption and, when possible, produce its own clean and renewable

energy. The Ironwood State Prison, a minimum and medium custody male offender prison housing more than 4,500 inmates, located along the desert border of California and Arizona, faces unique challenges and opportunities in addressing its energy needs.

In 2008, the California Department of Corrections and Rehabilitation (CDCR), Ironwood State Prison, and SunEdison, North America's largest solar energy services provider, partnered to activate 1.18 megawatt ground-mounted photovoltaic solar photovoltaic system. Through the partnership, SunEdison financed, constructed and now operates the solar energy system. Ironwood State Prison purchases solar energy at predictable prices equal or less than current retail rates. This photovoltaic solar system requires no water, unlike other solar systems, making it ideal in the drought-ridden climate. Given California's energy shortages, Ironwood is also a good neighbor, providing the nearby community of Blythe with zero-emission energy.

Over the lifetime of the system, Ironwood anticipates significant financial and other savings. For example, over 20 years of production, the system is expected to offset more than 31 million pounds of carbon dioxide, the equivalent of removing 3,100 cars from the road. The success of the Ironwood solar system has spurred CDCR to commence the process to install photovoltaic systems at 10 additional facilities.¹⁴

While few other prisons have installed photovoltaic panels, it is possible in climates outside of sunny California and is becoming a more popular practice. For example, the Riverside Correctional Facility in Philadelphia installed solar panels in 2008. Experts estimate savings of 20-25 percent, with the project paying for itself within 9 years of installation, and saving over \$ 1.1 million over anticipated 25-year life. Other projects from New Jersey to Nevada have also been initiated in recent years.

consumption and the last two, on operational approaches that can reduce costs and increase sustainability.

1. Reduce Loads and Heating, Cooling, and Lighting Demand

The greatest impact on energy use is obtained by reducing the heating and cooling needs of buildings. Tightening the building envelope to reduce heat gain in summer and heat loss in winter and utilizing favorable solar orientations can reduce energy consumption as much as 40 percent. Many state and federal incentives exist for these energy saving measures. Strategies include:

- Add insulation to walls and roofs
- Reward energy saving behaviors of prisoners and staff
- Upgrade windows, exterior doors, and weatherize buildings
- Eliminate thermal bridging at foundations, slab edges, parapets
- Utilize favorable south facing windows for winter heat gain
- Shade east and west windows from summer heat gain

2. Refine Systems to Increase Energy Efficiency by Updating Building Systems and Equipment

Replacement of existing low efficiency equipment is another source of energy cost reductions. With reduced demand after adding insulation, the more efficient equipment can be sized for smaller energy loads, increasing savings by as much as an additional 40 percent. Again, many incentive and grant programs exist that can reduce the initial capital outlay. Strategies include:

- Install Energy Star-rated equipment/appliances
- Upgrade efficiency of boilers and heaters
- Modernize energy management systems
- Install energy efficient lighting
- Install lighting controls with occupancy and daylight sensors

DENVER DETENTION CENTER

The recently completed Denver Detention Center is a model for current practice in detention center planning and design. It is a LEED Gold facility with well-insulated walls and roof, highly efficient mechanical systems, and low projected water use appropriate to its site in the arid high desert of Colorado. Its location in the civic center of Denver, with a tunnel connection to the new courthouse, greatly reduces vehicular trips for prisoners, staff and visitors. The building design is specifically intended to reflect the solid and dignified limestone massing of the adjacent Beaux Arts neo-Classical buildings of the civic center, including the Denver Mint, with no visible signifiers of a punitive purpose.

While the Denver Detention Center has many features that have positive social intentions that are not recognized by the LEED rating system, these features nevertheless fit with the social dimension of greening corrections. These include a planning strategy that precludes expansion, with a commitment to alternatives to incarceration that will limit the population of the facility. Opportunities for families, attorneys, and service providers to visit with detainees are convenient and low cost, with video booths allowing “Skype” visits, and windows to the housing units accessible to the public, without requiring detainee movement and the long wait times associated with traditional “contact” visits. For all of its advanced sustainable design features, the Denver Detention Center represents a *transition* to the facility of the future. For example, it does not utilize the abundant local sunshine as a renewable resource



Photo provided by RicciGreene Associates

via solar collectors. Due to its constrained site and budget, the Denver facility does not incorporate the kind of green programs that represent the next step in fully integrating the notion of a green building with sustainable programs, like urban gardening training, recycling, and other environmentally oriented job skills. It is, however, an exemplary model of current best practices.

The changing justice system with its increased focus on sustainable justice lends itself to increasingly sustainable facilities and operations. The green benefits of locating detention facilities such as the Denver Detention Center in urban settings derive primarily from the reduced transportation of inmates to and from court, and a similarly reduced travel requirement for professional and personal visitors. Staff can travel to work via public transportation or even bicycle. The ideal location for detention facilities is immediately adjacent to a courthouse, with a direct tunnel or bridge connection, like the historic Bridge of Sighs in Venice. The decision to locate the detention facility downtown, though it may prove more challenging to manage community concerns than for a less visible suburban or rural location, produces green benefits of reduced pollution and resource consumption, and builds green ties to the community it serves with its programs and products.

To learn more about the Denver Detention Center, go to www.denvergov.org/communitycorrections

3. Renew Energy Use by Adopting Zero Carbon or Lower Carbon Energy Sources

A new model for building development is the concept of Net Zero buildings, with net zero carbon emissions, energy use, and waste production. These buildings balance the carbon created by their construction and operations with onsite and offsite renewable energy sources and resource offsets. This is a visionary and ambitious goal, a standard that emphasizes the need to balance energy with other environmental goals, and a worthy long-term aspiration. With this goal in place, buildings can plan for incremental performance upgrades over time, incorporating mature technologies as they become cost effective. Strategies include:

- Install on-site generation from renewable sources (solar, wind, wood) including co-generation energy plants
- Purchase from renewable energy sources
- Switch to lower carbon fuels

4. Mine Your Waste: Recycle, Reuse, and Compost

Daily operations of correctional facilities often consume resources that can easily be reduced with minimal

cost and effort. This is especially true when considering the daily schedule and practices of inmates. For example, the food service side of correctional facilities has the potential for innovation: current practice puts large garbage disposals in kitchens, grinding food waste that is then flushed to the local water treatment plant. Recycling that food waste by means of composting has several benefits: reduced load for the water treatment plant, reduced transportation-related needs for waste, creation of valuable “clean” compost that can be used in gardening programs at the facility, sold to local farmers, or donated to community programs, and the training of inmates in the low-tech, low-entry barrier skills required to make this valuable product. Furthermore, food service operations also offer the potential for introduction of gardening and agriculture in both urban and rural settings.

State prisons have traditionally used rural low security facilities as a source of food production for inmate consumption. This concept can be extended to urban settings, where new techniques such as green roofs, hydroponic gardening, and vertical gardening can produce healthy, low-cost food for the inmate population. Training of inmates in food production and



gardening skills can be directed even to inmates serving relatively short sentences, and serve as a transition to reentry programs. According to the ASCA survey conducted for this paper,¹⁵ approximately 22 percent of states (of which 49 members representing 34 states responded – a full list of states surveyed is available in the appendix) are linking green vocational training opportunities with the broader sustainability efforts of the prison, mostly with greenhouse and horticulture programs or farm projects.

Cooperative relationships with community-based urban gardening groups that provide the expertise for training programs can be a key element to gaining community acceptance of the presence of a detention facility in a neighborhood. Greening the identity of the facility through its low resource consumption, visible renewable energy components, and green programs provides a narrative that helps a community to understand the benefit of its presence.

“Properly integrated with the form and patterns of adjacent building development, the detention facility can blend into the community, providing a secure and stabilizing ‘good neighbor’ in distressed neighborhoods.”

The experience developed in sustainable programs at Rikers Island, NY (see highlight on page 19) is readily transferable to the urban jail. Gardening and urban farming programs have been viewed from different perspectives: *Therapeutic*, as a low cost way of introducing programs that induce better behavior, both as a consequence of meaningful activity, and as a privilege earned through consistent “good behavior;” *Productive*, in creating valuable food crops that can be consumed by inmates or donated to the needy; and *Educational*, in creating a sense of environmental awareness and developing horticultural and farming skills. The ideal configuration of an urban farming program is one where the food waste stream is composted to provide soil for gardens on the building roof that help cool the building and store storm water, while producing food, and training inmates for green jobs once released. Gardening programs can be directed by outside not-for-profit groups who help create access to jobs with low barriers to entry.

5. Rethink Waste Water and Management

Water is one of the most valuable and limited resources for human life. Correctional facilities and their inmates use large amounts of water; as such reduction and reuse of water is an essential element of managing a green facility. Water reduction and reuse can be done in a variety of ways. Consider the following:

- Low flow toilets and appliances can greatly reduce water consumption in a facility, while also decreasing the risk of fixtures being clogged by inmates forcing clothing into the piping. An innovative technology successfully implemented in several facilities is a vacuum flush system that radically reduces the water volume and the opportunity for clogging pipes. The system is fully compatible with the operational need of a secure facility and is price competitive with conventional systems.
- Green roofs reduce runoff into storm water systems, cooling both the spaces below and the neighboring environment, and serve as a source of food production and locus of inmate gardening training programs, if developed as roof gardens.
- Capturing grey water before release into the sanitary systems emphasizes using water twice before discarding. Water from roof drains, sinks, and other non-potable sources can be stored in tanks and diverted to cooling towers, toilet flushing, and irrigation.



Photo provided by Horticultural Society of New York

- Rain gardens, permeable paving and soft curbs are some of the measures that can be used to reduce run-off from site development and the impact of surges on treatment plants, particularly in areas in older cities where the storm and sanitary systems are combined.



WASHINGTON STATE DEPARTMENT OF CORRECTIONS

The Sustainable Prisons Project

In 2002, then-Washington Governor Locke challenged all state agencies to meet new sustainability standards. An Executive Order required each agency to set specific, long-term sustainability goals to reduce waste, water, and energy consumption, and report progress on a biannual basis. The Washington Department of Corrections (DOC), determined to exceed all expectations, launched an ambitious effort, leveraging the power and creativity of partners to reduce its annual budget and prepare inmates for the outside world. This coincided with the initiation of a partnership with scientists from The Evergreen State College (TESC), a public liberal arts institution of higher learning in Olympia, Washington, who enlisted the help of inmates to carry out sustainability practices and conservation biology research on endangered species in the bioregion. Today, Washington's DOC has not only exceeded expectations, but has garnered national media attention and recognition for its innovative and unique sustainability practices and programs.

Like all government agencies in Washington state, the DOC was required to meet specific sustainability challenges. Because prisons tend to consume exorbitant amounts of water and energy, the DOC took these requirements seriously, hiring a full time sustainability coordinator and setting ambitious goals. The DOC then set 5, 10, and 25 year performance goals for energy, water and waste consumption, as well as a goal impacting the organization's culture around sustainability,

with 2004 serving as a baseline. Each year, the DOC publishes a “Sustainability Progress Report” highlighting six baseline areas which include: 1) Reduce dependence on non-renewable energy and fuel source, 2) Reduce potable water use, 3) Reduce waste, 4) Reduce use of toxic materials, 5) Increase the sustainability of facilities, and 6) Increase the Department’s commitment to and employee awareness of sustainability. Each of Washington’s 15 correctional facilities reports out progress in the six areas, as well as any pilot programs such as the Washington Correctional Center’s Solid Waste Reduction Pilot. The report has sophisticated measurements; for example, energy consumption can be adjusted for weather conditions such as a historically cold winter or summer heat wave.

The information collected in the reports is also an essential management tool with important budget implications. For example, the Washington Corrections Center for Women suspected energy waste based on annual reports. After an audit from the state’s Energy Service Company confirmed these suspicions, WCC updated heating, lighting and water systems.¹³ In fact, projections anticipate savings of over \$163,500 annually. Early reports already show a 12 percent reduction in energy use per offender compared to the 2004 baseline.

Correctional facilities nationwide most likely have some of the information presented in Washington’s annual Sustainability Report, such as the amount of energy consumed annually. However, few correctional facilities present the information so that progress is easily understood over time and facility managers can take practical steps to reduce waste, water, and energy consumption. For example, Washington’s DOC breaks down energy consumption in two ways, first, by offender and, second, by square foot. Over a several year period, the DOC can see if it is being responsive to changing prison populations and building age and maintenance. Washington’s report may serve as a template or planning tool for other states to set goals and implement cost-effective sustainability programs. For more information, visit the DOC’s website at <http://www.doc.wa.gov/goals/sustainability/>. Beyond upgrading existing buildings, the DOC has built 38 new buildings, all rated LEED Silver or Gold, including the only Gold certified campus, Coyote Ridge Corrections Center.

Table 2: Total Facility Energy Use for FY03 through FY09 with all Energy Sources Converted to KWH

Total Annual Energy Use			
Fiscal Year	KWH	KWH per Offender	KWH per sq. ft.
FY03	387,371,962	1,809	4.08
FY04	389,677,690	1,822	4.01
FY05	394,988,544	1,788	4.00
FY06	387,518,794	1,814	3.82
FY07	403,319,934	1,868	4.02
FY08	420,632,554	1,934	4.07
FY09	410,990,709	1,891	3.85
Percent Change from FY03	6.1%	4.5%	-5.7%

The Washington DOC has also enhanced and supplemented its sustainability work through partners. Six years ago, a Superintendent and Dr. Nalini Nadkarni, an ecology professor at TESC, met by happenstance and created a vision to connect prisoners and prisons to nature and science. The resulting partnership began at a small minimum security men's prison (Cedar Creek Corrections Center, CCCC) in a project they called the "Sustainable Prisons Project." They focused in three areas: 1) green-collar education and training, 2) sustainable operations of prisons, and 3) scientific research and conservation. Today, the Sustainable Prisons Project has expanded to four more prisons, both men's and women's, ranging from maximum to minimum security. While much of the project mirrors the work instigated by state mandates, the Sustainable Prisons Project also inspires DOC staff at other facilities to enhance and create new sustainability projects.

The Sustainable Prisons Project's first focus area, green-collar education and training, is achieved through guest lectures and hands on workshops. A lecture series, tailored to the needs and populations of each prison, has brought in experts to lecture on topics as varied as plant and wildlife ecology, sustainable agriculture, urban horticulture, alternative energy and building with recycled materials. Stafford Creek Corrections Center (SCCC) has hosted nearly 40 lectures attended by over 1800 inmates.

These lectures have had positive outcomes. For example, the Sustainable Prisons Project brought in a hydrologist to lecture staff and inmates on water use at CCCC with an unexpected outcome—the facility saw a reduction in water use and consequent increased performance of its waste water treatment plant. These changes helped CCCC avoid a planned \$1.4 million expansion of the treatment plant. The ease and impact of hosting lectures has inspired correctional facilities not formally included in the Sustainable Prisons Project to host guest lecturers as well.

Inmates, as both part of the Sustainable Prisons Project and outside it, work on green-collar training projects that have an immediate impact on their community. The SCCC hosts a Dog Training Program for dogs from shelters that are initially deemed poor candidates for adoption. After working with inmates and earning a Certificate of Training, dogs can be adopted by families. When inmates teach and practice discipline with dogs, they learn the same skills themselves. SCCC inmates also learn to give back through the "Bicycles from Heaven" project. For this project, inmates repair broken bicycles otherwise destined for the landfill. Based on this experience, other correctional facilities have started repairing medical equipment, such as medical beds and wheelchairs, reducing the need to replace high-cost equipment.

The Sustainable Prisons Project also engages inmates in work projects on green-collar education and training projects that have an impact on facility operations. Inmates engaged in the growing, sorting, building and cultivating tasks of the Sustainable Prisons Project glean career and technical skills that can translate into career pathways in the growing green sector of the economy after release. Prison building maintenance programs are integrating green elements; over 60 inmates involved in the Sustainable Prisons Project are gaining skills in horticulture, composting, and beekeeping.



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For example, at CCCC, organic vegetables planted and tended by inmates are served in the dining hall. The gardens are situated so that offenders pass them regularly, reinforcing the direct connections between humans and nature. At both CCCC and SCCC, inmates are part of a pilot training program to become beekeepers. Inmates take classroom study and apply knowledge about bee biology and behavior, hive construction and maintenance, beekeeping equipment and commercial business practices to their work. Participants also work closely with the project entomologist and beekeeper to design and conduct a research project with publishable results. Dan Pacholke, of the Washington DOC, touts the therapeutic quality of the connection to living beings that is gardening, a “sense of empathy,” he says, “you can’t replicate through cognitive behavioral therapy.” Inmates also support an on-site composting system with trace scraping to create a “closed loop” food system that reduced solid waste at the facility by 50 percent.



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The Sustainable Prisons Project’s second goal, to have an impact on sustainable operations, has had substantial effects on the DOC’s bottom line. For example, a zero-waste garbage sorting center at CCCC recoups commonly discarded objects such as silverware and clothing for reuse. The Monroe Correctional Facility, inspired by the work of the Sustainable Prisons Project, implemented its own waste reduction program and saves an estimated \$45,000 a year on trash can liners.

The third goal of the Sustainable Prisons Project is its most unique—to engage inmates in scientific research and conservation. Specifically, inmates become active partners with scientists in conservation and research by participating in captive rearing projects to help restore endangered species and threatened habitats. For example, through a partnership with the Washington Department of Fish and Wildlife, CCCC inmates raise young Oregon



Spotted Frogs, a state endangered species, for release into the wild. Inmates act as ecological research collaborators, responsible for feeding and cleaning the frogs, as well as providing fungal treatments, documenting water quality, specimen growth and mortality, and installing and maintaining equipment. At SCCC, inmates, working in partnership with The Nature Conservancy and U.S. Army, are propagating 200,000 native plants and prairie grasses for the Joint Base Ft. Lewis McChord military base, which protects the largest remaining portions of the Puget Sound's prairie ecosystems. A new program to rear endangered butterflies has begun at a women's minimum security prison, in collaboration with and funded by the U.S. Fish and Wildlife Service. The Sustainable Prisons Projects hopes to continue building partnerships with other researchers and expand research opportunities for inmates. Benefits of these projects go beyond the training inmates receive. Formal evaluation reveals that inmates gain a sense of purpose and contribution to society; elevate their sense of self-esteem; and carry out more and more positive social interactions with each other and with prison staff, all of which are congruent with rehabilitation programs traditionally offered in prisons.

The DOC has proved to be an innovator in the field of corrections, maximizing the impact of a state mandate to drive action and excellence, while drawing upon the power and capacity of partners to drive creativity and follow through with implementation. The end result is simple and directly aligns with the DOC's initial goals: 1) to drive down budget costs, and 2) to prepare inmates for jobs upon exit from the prisons.

To learn more about the Sustainable Prisons Project, go to www.sustainableprisons.org or contact Dan Pacholke, Washington State Department of Corrections at djpacholke@DOC1.WA.GOV

Aligning Sustainable Facilities with Sustainable Justice Systems

Sustainable planning and design principles apply at scales of development from the urban/community scale, to the building itself and to individuals using the spaces within. Each of these components affects the other. One cannot understand the building without reference to the community that it supports, or appreciate the building without understanding the people that it is intended for. Similarly, a LEED certified building that ignores the sustainability of its relations to the community forgoes holistic understanding of the importance of sustainability. The traditional model of a detention/correctional facility has treated energy, waste, and other sustainable issues as low priorities compared to the traditional priorities of security, staff efficiency, and low operational cost. The end of the era of low-cost energy, concerns about waste and pollution, and widespread acceptance of direct supervision operations housed in more “normative” environments create the conditions for a new model for facilities based on sustainable principles. The emerging definition of a 21st century detention/correctional facility is a high performance building

that provides safe, humane environments with low energy consumption and little pollution, and whose residents produce useful products by means of skills gained during their stay in the facility.

The daily experience of inmates and staff that spend significant time in these safe, healthy, and humane environments may eventually result in communities that are more sustainable because of these experiences. Extensive research regarding the impact of green buildings and exposure to nature on human behavior finds improved emotional well-being¹⁶ and in fact, one study found exposure to nature can reduce stress and aggressiveness.¹⁷ A sustainable model for corrections builds on the green facility with green programs including green job training to create an environment where transition back to society with a positive outcome becomes more likely.

“One cannot understand the building without reference to the community that it supports, or appreciate the building without understanding the people that it is intended for.”

The basis of a sustainable approach to justice facilities is that the future success of our society is as much bound up in the fate of those left in the wake of progress as those on its leading edge. Facilities designed for the incarcerated should be planned and designed with outcomes in mind. While materials and treatments will differ from mainstream buildings because of budget and security, the same care for scale, humane materials, healthy environment, and all of the metrics of energy efficiency should apply in equal measure.



Photo provided by RicciGreene Associates

THE HORTICULTURAL SOCIETY OF NEW YORK:

Rikers Island GreenHouse Program and the GreenTeam Transitional Employment program



Photo provided by Horticultural Society of New York

The Horticultural Society of New York (HSNY) is a 109 year old not-for-profit organization whose mission is to expand New York City's (NYC) greening efforts and to ensure that all New Yorkers enjoy the many benefits provided by horticulture. The benefits include: the beautification of home and garden to the community and environmental enhancement of green space, the nutrition of fresh vegetables of urban farms, the therapeutic power of cultivating plants, and job opportunities of green space maintenance and design.

HSNY has developed two unique horticultural programs – GreenHouse and GreenTeam – to serve the offender population in NYC, focusing on inmates and ex-offenders from the Rikers Island Correctional facility (Rikers). Rikers is operated by the NYC Department of Correction (NYC DOC) and houses a daily average of 14,000 detainees and sentenced inmates. These programs illustrate a successful private-public collaboration operating in a prison environment and providing a pathway toward rehabilitation and reentry into society. The partnership formed between the HSNY and the NYC DOC is the first such collaboration in the nation. Boston Minimum Facility, Baltimore City Jail, and the Staten Island Federal Prison have since developed similar projects, modeled on the NYC DOC and HSNY partnership.

GreenHouse

Started in 1989, the GreenHouse program affords the adult population from Rikers Island the opportunity to receive horticultural therapy and horticultural vocational training. GreenHouse participants cultivate a three-acre farm and provide maintenance services for landscaped areas around the correctional facility. Funded through private foundations and other grants secured by HSNY, participants receive 3 to 9 months of curriculum-based training to prepare them for work in the field

of horticulture, simultaneously building self-esteem, strengthening employment skills, and developing a greater sense of ethics. Program participants also receive therapeutic benefits: with guidance, they confront and work on the issues that have negatively impacted their lives, and are linked to homelessness, addiction, and health and nutrition problems. Participants also work on the emotional issues impeding their childcare and parenting abilities.

GreenTeam

Started in 1997, HSNY's GreenTeam is a unique "jail-to-street" program that provides post-incarceration transitional paid employment to graduates from the GreenHouse program. GreenTeam not only provides further training in horticulture, but also helps members to develop life skills and job-readiness, and to find full-time employment. GreenTeam members work on projects throughout NYC, creating gardens and farms primarily in collaboration with social service agencies whose clients suffer from mental illness, drug abuse, and other problems often associated with poverty.

Reduced Recidivism

Utilizing reconviction statistics on more than 500 program participants dating back over the course of eight years provided by the New York State Division of Criminal Justice, a recent study showed that individuals who graduate successfully from the GreenHouse and GreenTeam programs have a much better chance of successfully rejoining society. After one year, the reconviction rate of GreenHouse and GreenTeam graduates was 10 percent, compared to 21.5 percent of the general population of the formerly incarcerated in New York State, and within three years the rate was 25 percent for graduates, compared to 47 percent of the general population.

COMPLETING THE SUSTAINABLE MODEL: PREPARING AND TRAINING INMATES FOR THE GREENING OF THE ECONOMY

Translating a sustainable model for corrections into action steps that provide access to viable training, job opportunities, and career pathways for individuals in prisons and jails requires a broad understanding of the definition of the green economy, the sectors it spans, and the effects associated activities and technologies may have on occupational requirements and programs. From this understanding, administrators can start to adapt existing training programs or identify potential new green programs that provide the relevant skills, competencies, and credentials to inmates and the right strategic partners that support a continuum of learning opportunities during a transition to a greener economy.

Understanding Jobs in the Emerging Green Economy

There is a strong and increasing commitment in the United States to growing a clean energy and energy efficient economy, one that encourages public-private investments and promotes policies to foster the development and growth of green products, services, technologies, and jobs that will contribute to the US economic engine and foster sustainable development. According to a Pew Charitable Trusts Report, between 1998 and 2007, jobs and businesses in the clean economy grew 9.1 percent, compared to overall job growth of 3.7 percent.¹⁸ Currently, green jobs constitute a small part of the national economy and predicted levels of job growth range considerably from 16 million¹⁸ to only a slight expansion of the economy. Despite the uncertainty of the predictions, green jobs will continue to be an important economic and policy focal point, with continued federal investments and the expected benefit of the “greening” of all sectors of the economy helping to contribute to the long term sustainability of our nation.

With all the attention to the growing green economy, there is no general consensus on the definition of a green job (there still remain different approaches; see Defining Green Jobs side bar on page 24). However, it is still useful to have a broad based understanding of the green economy; according to a U.S. Department of Labor (DOL) funded-Occupation Information Network (O*NET) report, one definition (founded on general consensus of the literature) is:

“The green economy encompasses the economic activity related to reducing the use of fossil fuels, decreasing pollution and greenhouse gas emissions, increasing the efficiency of energy usage, recycling materials, and adopting renewable sources of energy.”¹⁹

The activities that make up the green economy span most key economic sectors, which may result in the production or provision of green goods or services or making business production processes more environmentally friendly. Many conversations over the past several years have focused on inherently green sectors such as renewable energy and energy efficiency. All sectors, however, including traditional ones such as construction, manufacturing, and transportation will be

“The activities that make up the green economy span most key economic sectors, which may result in the production or provision of green goods or services or making business production processes more environmentally friendly.”

or are currently in the process of “greening,” by incorporating new green practices, inputs or products. Currently, the key sectors identified by O*NET include:¹⁹

- Renewable Energy Generation
- Energy Efficiency
- Transportation
- Green Construction
- Environmental Protection
- Agricultural and Forestry
- Manufacturing
- Recycling and Waste Reduction

Equally important to understanding the green economy through an economic lens is the comprehension of how green economy activities and technologies affect occupations and their skill and competency requirements. It is helpful to move beyond simply applying a generic “green” label to many jobs, and instead more accurately describing it as the “greening of occupations.” The greening of occupations lends itself to three general categories that describe how green economy activities and technologies impact the skill sets, methods, and profiles of occupations in all sectors of the economy. According to the O*NET report, these categories include:

1. Green Increased Demand (ID):

“Green economic activities and technologies will increase the employment demand for these positions but will not reflect a significant change in the work itself or the skills/education required to perform the work. While the context of the work might be altered, the tasks themselves will basically remain the same.”

Example: An increase in employment opportunities for electrical power installers and repairers due to increased electrical demand and infrastructure upgrades.

2. Green Enhanced Skills (ES):

“Green economic activities and technologies will have a significant impact on these existing occupations, changing both the work and worker requirements. While the essential purpose of the occupation will remain the same, the tasks, skills and worker knowledge and credentials required for the position may change. It is unclear whether the changes will cause an increase in demand.”

Example: Biofuels plant construction workers, and green building architects.

3. Green New and Emerging (N&E):

“Evolution of green economic activities and technologies will create the need for unique work and worker requirements, generating new occupations.”

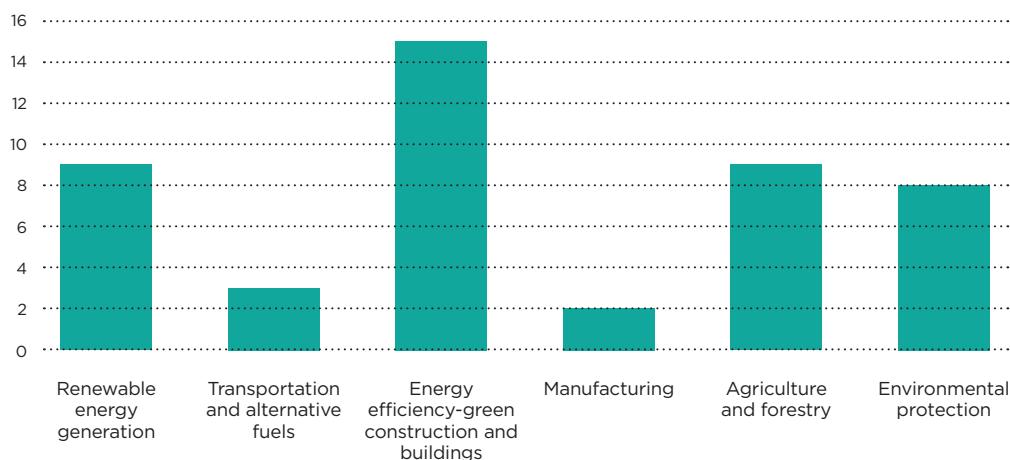
Example: A Solar Photovoltaic panel installer and technician, Energy Auditor, and Methane/Landfill Gas Collection System Operators.

The DOL O*NET report estimates that many occupations fit into the green enhanced skill occupations category, which means that although there will be a growing number of new and emerging occupations requiring new knowledge, skills, and competencies, the majority of jobs in the green economy will be transformed from traditional occupations. From a correctional education and training perspective, this means that much of the traditional education and vocational training offerings in prisons-- such as auto body repair and mechanics, horticulture, basic construction including electrical, carpentry, plumbing, and welding can be retooled or updated to reflect green technologies and practices. Indeed, according to the ASCA survey, over one quarter (27.5 percent) of correctional systems were adapting their existing vocational training programs to accommodate green practices, while another third (30 percent) were both adapting existing programs and creating new green education and training programs.¹⁵

Promising Greener Employment Opportunities

As sectors become greener in the economy, the most promising employment prospects for individuals with criminal records include construction and energy efficiency, manufacturing, transportation, natural resources/environmental protection, and renewable energy. Many of these industries have traditionally been more open to hiring individuals with criminal records and are considered promising because of their potential job growth, the range of jobs with lower education and training requirements, potential earnings for a family sustaining wage and career pathway, and fewer legal and other barriers to employment. These findings align well with the ASCA survey, which revealed that states that are providing green education and training programs in prisons are also targeting sectors that appear most promising for individuals with criminal records (see Chart 1).¹⁵

Chart 1: Most Frequent Sectors Targeted for Green Correctional Vocational Training Programs



"Employment in the energy efficiency services sector alone is likely to increase by a factor of two to four, accounting for approximately 1.2 million workers by 2020."

As policies change, investments in research and development increase, and the nation recovers from the economic downturn, the greatest potential for job growth among these sectors will most likely come from the renewable energy and energy efficiency and green construction sectors. Employment in the energy efficiency services sector alone is likely to increase by a factor of two to four, accounting for approximately 1.2 million workers by 2020,²¹ to meet the increasing demand for energy efficiency products and services across the country (see DOE Map 1 on page 25). Sixty-five percent of the jobs in the sector in the coming decade are expected to be with building and construction contractors and trades and many of these jobs will be built on existing occupations and skills such as HVAC technicians, electricians, plumbers, lighting contractors, and construction laborers. Workers in this sector will need to integrate new skill and competency requirements due to new materials, technologies, and work processes.²¹

Defining Green Jobs



Although there is not a clear consensus on a definition of a green job, the Bureau of Labor Statistics (BLS) has recently developed one for data collection purposes to understand the labor market impact of economic activity related to protecting the environment and conserving natural resources. The definition is based on both an output approach - which looks at businesses that produce green goods and services and counts the associated jobs and a process approach - and an input approach which identifies businesses that use environmentally friendly production processes and practices and counts the associated jobs.¹⁸ BLS offers that green jobs are either:

- Jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources, or
- Jobs in which workers' duties involve making their establishment's production processes more environmentally friendly or use fewer natural resources.²⁰

According to BLS, jobs in businesses that produce green goods and services are “those sold to customers and include research and development, installation, and maintenance services,” while jobs in the other category are those where workers research, develop, maintain, or use technologies and practices to lessen the environmental impact of their establishment, or train the establishment’s workers or contractors in these technologies and practices. Green goods and services and technologies and practices fall in the following categories: energy from renewable sources, energy efficiency, pollution reduction and removal, greenhouse gas reduction, recycling and reuse, natural resource conservation, environmental compliance, education and training, and public awareness.

The construction/energy efficiency industry on the commercial side has always been more accessible to individuals with criminal records, although the jobs tend to be temporary, seasonal, and may be in areas lacking adequate transportation, a problem for recently released prisoners who may have a suspended driver’s license or lack access to a car. In addition, if a job is connected to a union apprenticeship, there may be some barriers because basic requirements of union membership typically require a high school diploma or GED. Pre-apprenticeship opportunities do not have those same constraints and, when coupled with basic education and on-the-job training either at the correctional facility or in a reentry program, it may serve as a good on-ramp to apprenticeship.

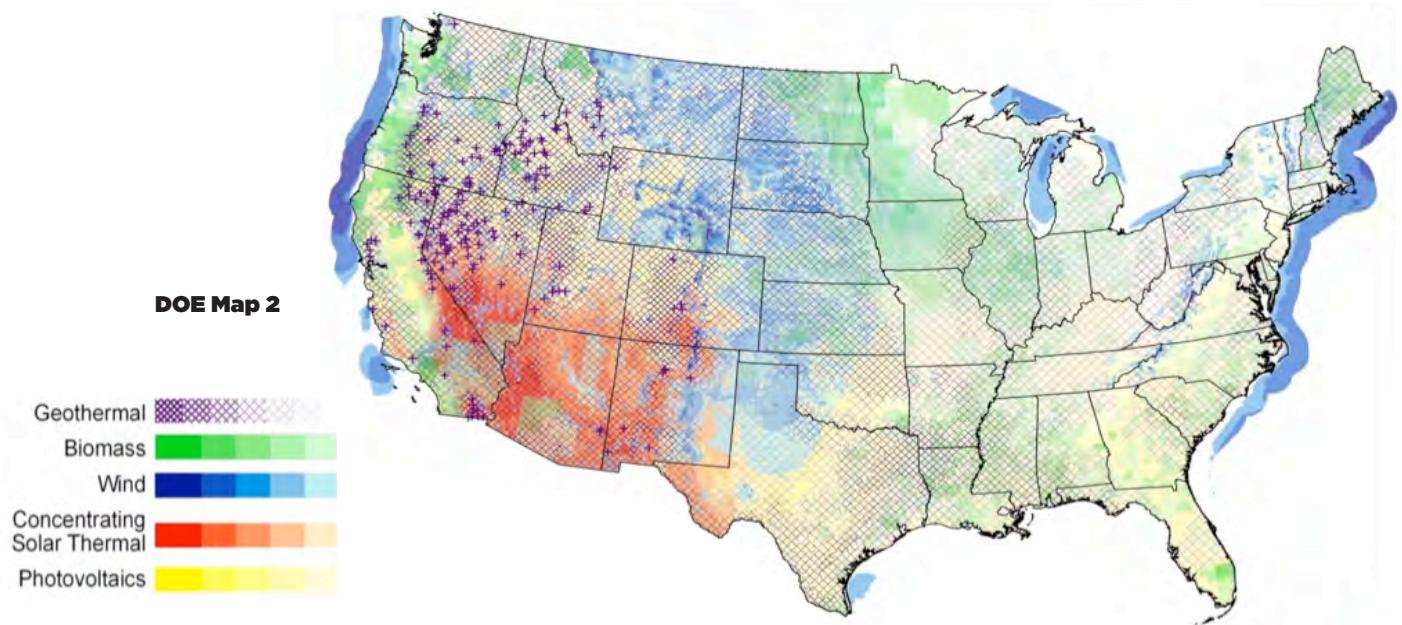
According to the Center on Wisconsin Strategy (COWS), there are a variety of energy efficiency professional development programs and exams offered by third party and trade associations, including the Building Performance Institute (BPI), Residential Energy Services Network (RESNET), and the North American Technician Excellence (NATE).²² One such certification is BPI, which works with local training affiliates across the country to offer “certification, accreditation, and a quality assurance program” for building performance technicians. Worker competencies are certified according to training and experience and their ability to pass both written and field exams. BPI offers training and verifies workers skills for a range of areas including: building analyst, building envelope, manufactured housing, heating and air conditioning, and several areas

geared toward multifamily buildings such as energy efficiency, hydronic heating design and heating plant technicians. It should be noted that some of the certification tests may be difficult to pass for individuals with low reading or math skills and these certifications do not take the place of trade training and on-the-job work experience.



The renewable energy sector, which includes wind, solar, geothermal, and biomass, has been the focus of much of the dialogue on green jobs, even though it currently represents only a small percentage of overall jobs in the emerging green economy. Growth in this sector will be largely due to rising energy prices, advances in technology, and continued enactment of federal and state policies and financial incentives. When developing renewable energy training programs it is important to understand if these jobs currently exist in the labor market to ensure there will be employment at reentry. In addition, unlike energy efficiency, some renewable energy jobs may be more prominent in certain areas of the country than others, depending on regional assets, another important reason to align training programs with labor markets (see DOE Map 2 on page 26).

Many key occupations in the solar industry, such as designing, installing, or selling solar equipment, are considered new and emerging; nonetheless, individuals with skills in traditional industries such as construction (e.g. roofers, plumbers, HVAC technicians and electricians), sales, telecommunication, and other technical industries may be well-suited for these occupations with the necessary training, credentials, and/or on-the-job experience. Currently, the solar industry offers one of the best certifications for renewable energy generation designed by the North American Board of Certified Energy Practitioners (NABCEP).²⁷ NABCEP completed task



analyses in two key occupations, solar photo-voltaic (PV) system installers and solar thermal installers, which created a professional certification program for journeymen, contractors and foremen working in these occupations. NABCEP has also developed an entry-level exam for PV systems targeted at workers interested in entering the solar industry. These certifications, however, may be difficult to obtain if the person has low reading or math skills and/or little work experience, as it recognizes the advanced knowledge in the field. NABCEP certification may be something to work towards on a career pathway once the academic and hands-on skills training is provided and, hopefully, mastered while in prison.

Wind, another source of renewable energy, is also promising for job prospects, although it still represents a small percentage of jobs in the economy. By 2030, 20 percent of our nation's power may be supplied by wind energy. According to the American Wind Energy Association, currently over 85,000 people are employed in the industry, both professional and skilled workers. If the goal of 20 percent wind electricity by 2030 is to be reached, it is expected that at least 250,000 additional workers will be needed, many from the construction sector.²⁴ Prisoners that would be ideal for wind careers include those with electrical and manufacturing skills, gained through work experience in traditional industries such as automotive, and telecommunication sectors.

Electric and natural gas utility companies, which play a critical role in our nation's energy usage and have jobs that exist in today's economy, are struggling to fill skilled technical and craft positions. According to the U.S. Bureau of Labor Statistics, the demand for entry-level line workers, powerplant operators, pipe fitters, and other positions that require technical knowledge is expected to grow by 9 percent annually, with the baby-boomers retiring in record numbers, growing demand for electricity, and continued infrastructure upgrades and advancement of

smart grid technology. These jobs are stable, physically demanding, and pay well, however, they may be challenging to access since utility companies may have a ban on hiring individuals convicted of a felony, depending on state law. The jobs for skilled technician positions, like many in high demand fields, require some level of postsecondary education that may include pre-apprenticeships, technical certificates, or associate degrees and bachelor degrees.²⁵

Green economy activities in manufacturing will encompass production of green materials/goods across all sectors or will be making the practices and/or technologies to the production processes more environmentally-friendly or using fewer natural resources. Most likely, manufacturing jobs may eventually grow due to an increased demand of existing jobs due to green economy activities (O*NET report) or the existing jobs may be required to integrate green skills and competencies without necessarily growth in jobs. In either case, inmates may gain these skills through correctional industries (CI) programs since many are in the process of creating sustainable production processes and practices and producing and distributing of environmentally friendly product and services (see Correctional Industries section on page 38).

In addition, many of the jobs in the green economy today are in natural resources conservation, pollution mitigation, recycling, and waste reduction (65 percent according to the Pew Report), and are accessible to individuals with criminal records. Fortunately, correctional facilities are creating living laboratories as they are implementing their sustainability initiatives, providing inmates with hands-on learning opportunities that include organic gardening, landscaping, and recycling (see highlights on Rikers Island, page 19, and Washington, page 13) that may translate into job opportunities. For example, organic farming is one of the fastest growing segments of U.S. agriculture, with a growth rate of more than 20 percent annually. Further, according to BLS, the demand for occupations in waste management will increase by as much as 20 percent between 2008 and 2018,²⁶ some which will include growth in existing occupations such as waste water and systems operators (20 percent) as well as refuse and recyclable materials collectors (19 percent).

Although opportunities in the greening economy may exist across all sectors for formerly incarcerated individuals, it is also important to note that many of the national certifications in green sectors are focused on jobs at the high-end, professional level of the labor market and very few exist for occupations identified for the low-skilled/educated workforce. Even entry-level certifications, which fewer certificates exist, may be too difficult to obtain for individuals with low reading and math skills. If correctional and reentry professionals are considering a certification attached to a new or adapted green training program, according to COWS, "it is essential that it is meaningful in the labor market, workers can easily understand how to obtain it, it is standardized, portable so it is not connected to one specific region, employer, or institution, and when possible, integrated in a pathway that is linked to a job or the next level of training."²⁷

Although there are a range of green jobs at the high, middle, and low skill levels, the chart on page 29 highlights examples of specific jobs that are more likely to be accessible and available in the labor market to ex-offenders to get them on the pathway to a family sustaining wage. This chart neither replaces the need to understand region and local labor markets, which can be accessed through working with economic and workforce development agencies, nor addresses the multiple challenges that formerly incarcerated individuals may face to be gainfully employed such as discrimination.

Securing stable employment for these highlighted jobs or for other jobs will require prisoners first to acquire the foundational competencies upon which to build greener technical skills. Foundational skills, which include workplace readiness, personal effectiveness, motivation, interpersonal skills, and basic academic skills such as reading and math are considered the most important factors for workers with limited skills or previous work experience to achieve short-term employment retention, regardless of sector. Teaching foundational skills in the context of work has been shown to be an effective way of learning.²⁹ According to a study conducted by Corporate Voices for Working Families, The Conference Board, the Partnership for 21st Century Skills, and the Society for Human Resource Management, more than 400 U.S. employers identified the skills they thought were most important for the success of new entrants to the workforce and skills cited included: professionalism/work ethic, oral and written communications, teamwork/collaboration, and critical thinking/problem solving/creativity.

Many correctional facilities offer some type of “life/job readiness skills” course or program,³⁰ however, they are usually limited, vary widely in focus and comprehensiveness, and may not be integrated into vocational education and training and work experience.³¹ A correctional facility that integrates life and work readiness skills training for inmates into their overall sustainability efforts provide the perfect avenue to create a culture of shared purpose, values, and language between staff and inmates. This shared culture may in fact bring about greater cognitive changes that help inmates make a successful transition

Photo provided by Horticultural Society of New York



to the community and workplace, than do stand alone “life skills” classes. Helping prisoners connect to causes greater than themselves, such as animal care and environmental preservation, may create a consistent pattern of violence reduction and

better behavior during incarceration, as seen by the Washington State example (see highlight on page 13). These experiences not only provide transferable job skills, but may also allow for personal development and growth opportunities that improve prisoners’ attitudes and behaviors toward their communities and create cultural change within the facility.

As correctional facilities begin to prepare inmates for the full range of basic education classes including ABE, ESL, and GED preparation needed to succeed in the green labor market or the labor market in general, it is also critical to prepare them at the same time for entry into and success in postsecondary education and training. With 63 percent of all American job openings requiring some sort of postsecondary education by 2018,³² prisoners with a high school diploma or less, approximately 41 percent of inmates in prison or jails, may be relegated to occupations that are either declining or pay low wages in the green economy or return to criminal activities. Several studies have shown that many green jobs will be concentrated in middle skill jobs, requiring some postsecondary education. Offering the GED credential is still very important, but not necessarily as the end goal; rather, the GED credential is a launching pad for postsecondary education and training resulting in industry recognized credentials.

Currently, most correctional facilities offer academic and vocational education programs, yet only a small percentage of inmates are enrolled in postsecondary correctional education.³³ Correctional facilities that have postsecondary education opportunities usually partner with community colleges,³⁴ which provide a range of courses and programs that may result in credentials from short-term

Table 1: Examples of Job Opportunities in the Green Economy²⁸

Sector(s)	Occupation Title	Most significant source of education or training	Highest Educational Attainment for Majority of Jobs	Wages		O*NET Category	Projected Growth 2008-2018	Projected Job Openings 2008-2018
				Entry Level	Average Annual			
Recycling and Waste Reduction	Production Workers	Moderate-term on-the-job training	HS or Less*	18,790	30,460	N&E	Little or No Change	70,900
Green Construction / Transportation	Industrial Truck and Tractor Operators	Short-term on-the-job training	HS or Less	21,800	31,910	ID	Slower than Average	198,600
Transportation	Cargo and Freight Agents	Moderate-term on-the-job training	Equal distribution between HS or less and Some College	22,200	37,060	N&E	Much Faster than Average	40,300
Green Construction	Electricians	Long-term on-the-job training	Almost equal distribution between HS or Less and Some College	27,970	45,980	ID	Average	250,900
Green Construction	Helpers—Carpenters	Short-term on-the-job training	HS or Less	17,550	26,010	ID	Much Faster than Average	353,000
Green Construction / Manufacturing	Welders, Cutters, Solderers and Brazers	Postsecondary certification	HS or Less	25,250	37,980	ID	Little to No Change	126,300
Energy Efficiency / Green Construction	Heating and Air Conditioning Mechanics and Installers	Postsecondary certificate	HS or Less	24,750	39,320	ID/ES	Much Faster than Average	136,200
Renewable Energy Generation	Installation, maintenance, and repair workers	Moderate-term on-the-job training	HS or Less	19,830	32,180	N&E	Average	41,800
Energy Efficiency / Environment Protection / Manufacturing / Renewable Energy Generation	Maintenance and Repair Workers, General	Moderate-term on-the-job training	HS or Less	26,160	40,630	ES	Average	357,500
Research, Design, and Consulting Services	Customer Service	Moderate-term on-the-job training	Some College, Including AA	22,120	32,180	ID	Faster than Average	1,108,400

SOURCES: O*NET Online Green Economy Sector, available at <http://online.onetcenter.org/find/green?n=0&g=Go>;

Bureau of Labor Statistics May 2009 Occupational Employment and Wage Estimates, National 3-digit NAICS

Industry-Specific estimates, available at http://www.bls.gov/oes/oes_dl.htm; Bureau of Labor Statistics

Occupational Tables 1.1 through 1.11, available at http://www.bls.gov/oes/oes_dl.htm; and Greening the World of Work,

available at http://www.bls.gov/oes/oes_dl.htm.

noncredit certificates to associates degrees through a centralized or a decentralized partnership model. Community colleges can be an important entry point for those inmates with no college education or even those lacking a high school diploma and are a natural partner for prisons given their commitment to open access admission. Correctional facilities are encouraged to build partnerships or expand existing ones with community colleges, as many new innovative strategies have been created that may help inmates accelerate into postsecondary education with a credential and job within any sector, including green ones. These strategies include contextualization and integration of basic skills and English language into the program's workforce readiness and technical skills training and shorter modules and accelerated certificate programs that make it easier and more desirable for students to complete quickly and attach to the labor market. Given the challenges of low completion rates due to inmate transfer between prison and work assignments, lack of resources, and other factors, these types of models may have greater success in putting inmates on a pathway to a good job in the green economy.

Another reason why correctional facilities should reach out to community colleges is that many are on the forefront of green workforce education and sustainability and correctional professionals may be able to draw on their vast experience and expertise. Colleges may be able to provide valuable information to access resources on best practices and strategies, link to courses, certificates and degree programs that support industry, provide technical instructors and innovative teaching methods and curricula, and offer technical support in a variety of sectors. One resource that highlights examples of green community college workforce development programs is Going Green: The Vital Role of Community Colleges in Building a Sustainable Future and Green Workforce and can be found at www.aed.org/News/Releases/going_green.cfm.

For correctional facilities interested in forming a partnership with community colleges, a recent U.S. Department of Education report on partnerships

between community colleges and prisons laid out several key elements to successfully providing correctional education services to inmates. These elements included an effective management structure, adequate funding, appropriate instruction, and practical and creative strategies to address challenges such as low completion rates.³³ In addition, representatives from community college-prison partnerships identified in the report stated that other important factors for success included willingness to compromise, good communication, trust, buy-in from all levels, shared leadership, and a flexible framework³⁴ – many of which are critical to all strategic partnership endeavors.

Strategic Partnerships and Resources

Strategic partnerships will be critical to the success of developing and implementing green employment and training programs in correctional facilities and partners should include employers, unions, education and workforce development systems, community colleges and universities, and community-based organizations. These partners may be able to provide access to funding, equipment for training, instructors and curriculum, and an understanding of the state and local labor markets.

Strategic partnerships with local and regional community colleges, as stated earlier, can help accelerate efforts in implementing green jobs training programs in correctional facilities. The American Association of Community Colleges, which recently developed the Sustainability Education and Economic Development (SEED) Center, can help identify community colleges that provide green jobs training and educational offerings in the local area. SEED also inventories programs, curricula, and other materials and courses across the country and provides valuable, up-to-date information from an educational perspective. More information can be obtained at www.theseedcenter.org.

National Weatherization Training Portal



The U.S. Department of Energy (DOE) has created The National Weatherization Training Portal (NWTP), featuring multi-media, interactive, self-paced training modules. While this training portal will not replace the need for formal, hands-on-training, it will enhance or augment the training conducted across the country. The NWTP courses cover basic and advanced building sciences and weatherization through a flexible and adaptive learning platform. Coursework can be customized to meet the needs of individuals seeking a career in the fast-growing weatherization industry and of current professionals from energy auditors to field technicians. By advancing through the self-paced NWTP curriculum, students prepare themselves to pursue field training and various industry certifications. Courses address building science at all levels, from the role of pressure diagnostics in ensuring safe indoor air quality to proper techniques for installing various cost-effective, energy-saving measures. Courses provide an individualized learning experience that adapts to the needs of each student. Training support can be tailored to weatherization workers at all skill levels and positions, including crew member, crew chief, auditor, and trainer.

The NWTP uses open-source systems and accessible standards and software (Ilias learning management system and Google's O3D). This approach allows the broader weatherization community, including the established network of local weatherization providers, to contribute to the future development of this resource.

The NWTP learning management system provides the following:

- Web-based system that is easy to use for both students and trainers
- Adaptive learning system that tracks and tailors courses based on user progress
- Easy-to-access, online system that creates, stores, and maintains training curriculum
- Immersive, online training that is cost effective and allows content to be reused and repurposed by developers and trainers.

For more information on the system or to learn more about collaborating with the U.S. Department of Energy through open source, please contact: NWTPWebmaster@EE.DOE.GOV

Developing partnerships with the workforce system and local employers is an important strategy because it ensures that the training is relevant, meets the needs of industry, and allows access to accurate local labor market information in the green economy. This is particularly important as information on actual jobs in the region and the skills and competencies required for jobs is still considered a work in progress. The new BLS study on green jobs will be very helpful in the future

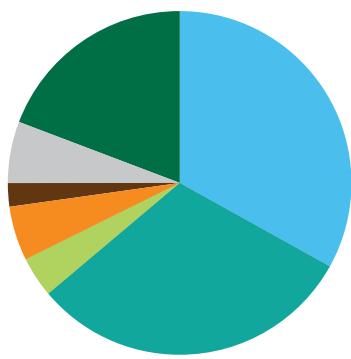
as will the results of labor market information activities conducted by state and local workforce agencies for the U.S. Department of Labor (DOL) grants, awarded under the American Recovery and Reinvestment Act. Working closely with employers, including unions, in the area will be an important way to understand their hiring needs and plans for growth and expansion to supplement labor market information, which is based on projections.

A good national resource created by DOL is the green jobs community of practice, which can be found at <https://greenjobs.workforce3one.org/page/home>. On this site, organizations can access reports, promising practices, and other information that may be useful to implementing green jobs training program.

Many federal agencies, including Departments of Labor, Justice, Education, Energy, Interior, Housing and Urban Development, Agriculture, and EPA have been involved in initiatives focused on green jobs and sustainability. These federal agencies may provide funding opportunities to implement programs and many have created resources that could be very useful to correctional educators as they build or adapt their green programs. One example of a valuable resource created by the Department of Energy (DOE) is a national training platform (see highlighted box on the National Weatherization Training Portal on page 31) that provides on-line modules for weatherization and soon-to-be released renewable energy occupations. This on-line training can be adapted for correctional facilities concerned about secure internet access, as materials are available through CD-rom.

According to the ASCA survey, many states have begun working closely with partners to design and implement green programs, with over a third (37.5 percent) of respondents forming strategic partnerships with outside organizations.¹⁵ These organizations included: local career technical and vocational rehabilitation programs, state Departments of Education, local employment agencies, and Habitat for Humanity. One example of a partnership with employers was the first ever Green Jobs Fair at the San Quentin prison held in August 2010. The fair was organized by the California Reentry and the Insight Garden programs and was attended by about 60 employers representing the green technologies and sustainable agriculture arenas, as well as local food, farming, and gardening programs.

Chart 2: Barriers to Green Jobs Training



Institutional Barriers

A number of barriers may exist within correctional facilities when establishing or adapting green training and vocational programs, especially ones that hope to train inmates in new technologies and practices. According to the results of the ASCA survey, one of the biggest barriers (see Chart 2) to implementing green programming was the high cost of equipment, reported by over half (57.5 percent) of respondents. Another substantial challenge to greening correctional education and training programs, reported by 32.5 percent of respondents, was that the facilities' staff lacked the expertise and training to implement these green programs and practices. For correctional facilities that utilized partnerships to implement such programming, it was difficult to find partners that could adapt their curriculum to include green skills and competencies that were applicable to inmates. Another third of respondents (32.5 percent) cited current budget constraints as a barrier to incorporating green elements into their programs.¹⁵ Even with these barriers, a majority of the respondents who reported that their facilities are not currently adapting or creating green vocational education programs said they planned to do so in the near future.



MISSOURI DEPARTMENT OF CORRECTIONS

With a \$200,000 American Recovery and Reinvestment Act (ARRA) grant from the federal government, Missouri's Department of Corrections set about updating more than twenty career and technical education programs in institutions across the state with green curricula, equipment, and supplies. In Fiscal Year 2009, more than 1,500 offenders across Missouri enrolled in "greened" programs including building trades, electrical wiring, plumbing, auto, and horticulture. With careful attention to facilities' needs, Missouri has been able to implement new, greener programs in facilities at every security level, from Level 2 to Level 5. This level of customization is crucial to the success of the new education programs. "When bringing in a new program," explains Dana Keller, Career and Technical Programs Coordinator with the Missouri Department of Corrections, "you have to give institutions some say so in what's coming into their facility."

Customization is equally important in making these updated education and training programs work for Missouri offenders. By working with special education instructors, the certified vocational instructors who are bringing the new programs to inmates have been able to meet the needs of diverse learners. Offenders are expected to demonstrate an eighth grade reading level and complete an application process before joining the programs. To maximize the impact of federal dollars, grant money was used only to update existing programs and not to implement brand new programs in the state's facilities. The Department of Corrections began implementing its green curricular enhancements in February of 2009. Though the Department hasn't yet seen "the full realization of what we've done," according to Keller, grant funding has allowed a spate of activities in eight facilities for both male and female inmates across the state.



Photo provided by National Correctional Industries Association

The Department has purchased off-the-shelf curricula in areas including carpentry, business, and home weatherization. Enrollees in the Professional Gardening program at one female facility are trained on xeriscape landscaping, or working with drought resistant plants. With ARRA funding, the Department of Corrections also offers professional development to full time correctional staff. Two staff members spent a week training with the National Center for Construction Education and Research (NCCER) and upon return were able to “train the trainers” of the green-enhanced programs. Offenders enrolled in the programs are trained on new and state of the art equipment, including windows, doors, and solar panels in the building weatherization program. All of the equipment is purchased with an eye towards being “to teach with, not just to have.” The Department has plans to purchase and bring to each institution an electric car for use in hands-on training. But the new green bent to the Department’s education and training program is visible in smaller ways too; for example, the cosmetology program now uses only

organic products. The Department intentionally chose areas for enhancement that would not only teach offenders to be green but also align with workforce needs. Developing job trends, and the Department’s collaboration with the Missouri Department of Economic Development’s Division of Workforce Development, was one primary impetus behind the decision to implement green-enhanced education and training programs. Graduates of the building trades program can earn NCCER certification, a boon for many inmates who may have entered the program with little productive work experience and few marketable skills. Of holding a nationally recognized accreditation on release, Keller says, “it’s huge.”

To learn more about Missouri’s green education and training programs, go to <http://doc.mo.gov/> or contact Dana Keller, Career and Technical Programs Coordinator, Missouri Department of Corrections, at Dana.Keller@doc.mo.gov.

Environmental Literacy

As prisoners begin to train for jobs that require green skills and competencies, correctional administrators should consider incorporating environmental literacy into their vocational and educational programming. Environmental literacy helps provide individuals with the knowledge, skills, and understanding needed to think about environmental topics and concerns and includes the environment as an important consideration in daily life.

“Being environmentally literate requires basic understanding of natural systems, biological systems, and social systems and allows workers that are preparing for jobs in the green economy to understand the context in which they work.”

Currently, over a third of state correctional administrators surveyed reported efforts to integrate environmental literacy with green education and training programs.³⁴

To assist correctional facilities with incorporating environmental literacy curriculum into their programs, a review was conducted for this paper of nationally available curricula that were designed for youth and adults, could be used in any geographic area, had general environmental content and were not topic or technically specific (example: energy, water, waste, etc.), were timely, and included current information.

To evaluate each curriculum, 27 criteria were identified, including:

- literacy levels
- intent of the curriculum
- target population
- content relevancy to target population
- instructional design
- training for instructors (or lack of)
- support needed to teach the curriculum
- mode of instruction (video, textbook)
- cost
- criteria and methods used to measure success with target population, accessibility, languages offered
- ease of use for instructor

- student materials and resources
- pricing
- ease of use for students
- potential to help an incarcerated population understand the green economy and/or green jobs

After careful review, each curriculum was assessed for its value in helping the prison population understand and identify employment opportunities in the green economy, and each curriculum was recommended in terms of relevance and adaptability for the incarcerated population.

Of those reviewed, six of the curricula had the potential to be adapted or used with incarcerated youth and adults. They were: *The Cary Institute of Ecosystem Studies*, *Ella Baker Center*, *Facing the Future*, *Green Steps School*, *Leave No Trace*, and *Roots of Success*. All six were designed for students with reading levels lower than ninth grade and with limited math skills, but were content appropriate for older youth and young adults. Of these six, the three that would be most immediately useful for incarcerated youth and adults were: *Ella Baker Center*, *Facing the Future*, and *Roots of Success*. These three were selected because, in addition to meeting the literacy needs of the population, they focused on both environmental science and social issues and were directly relevant to the target population. All three included extensive resources for instructors as well as activities and exercises for students. All three challenged the students intellectually but were not too difficult for youth and adults with limited academic proficiencies. Of these three, the *Ella Baker Center* and *Roots for Success* curricula included an explicit and well-developed focus on the green economy and on preparing youth and adults for green jobs. The following pages contain short summaries of these curricula and links to obtain more information.

Cary Institute of Ecosystem Studies

The Cary Institute of Ecosystem Studies environmental literacy curriculum is designed to help students “understand the connections between water and air pollution through the concept of watersheds and airsheds, as well as understand the impacts of their decisions on human health and biodiversity.” Its goal is to help middle and high school students to become decision makers in a hypothetical town and county. The curriculum uses lesson plans and various activities to position students to think about how they would make environmentally conscious decisions in a hypothetical town. It is downloadable and easily available online by the general public. The level of literacy needed for this curriculum is moderate and appropriate for students in middle and high schools. Overall, this curriculum can easily be adapted to the prison population and used in the prison setting because of its group involvement, interactive nature and potential to involve students in the decision-making process.

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Additional information can be found at www.ecostudies.org

Ella Baker Center

This curriculum was “designed to begin a conversation among young people (and interested adults) about the rapidly growing green economy, and how it can be leveraged to solve two crises in our cities – environmental degradation and rampant social inequality.” The curriculum explores five key themes surrounding the Ella Baker Center’s work-- the green economy, eco-equity, eco-privilege, model cities, and restorative justice. The content is designed to provide information about social justice and the economy. Although designed for youth, the curriculum assumes very high levels of knowledge about these five themes on the part of both the instructor and the students. The student activities require very high levels of literacy in terms of reading, writing, critical thinking, and comprehension. To be useful to youth and adults with limited academic proficiency, the instructor would need to work in very small groups and lead the students through each exercise, including reading the text out

loud to students at times. This curriculum is notable and valuable for the target population because it focuses on social and economic inequality in the United States and provides the target population with information about the green economy and green jobs. Overall, this is an excellent resource for instructors to learn from, but it would need to be adapted for the prison population because the literacy level is very high.

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The Ella Baker Centers Green-Collar Jobs Campaign Teaching Tools can be found at <http://www.ellabakercenter.org> under “Resources” then “Teaching Tools.”

Facing the Future

Facing the Future has produced a series of books that can be purchased, but are also available in PDF format for those willing to spend time downloading individual books and documents. The books are designed as lesson plans for teachers. There are books for elementary, middle, high school and post secondary teachers and each is aligned with several state and national education standards. The content ranges from general discussion of global issues and sustainable solutions to a more specific emphasis on climate change. The book *Engaging Students through Global Issues* is particularly relevant to the target population. These lesson plans help teachers present difficult academic concepts to students in grade levels 5-12. *Engaging Students through Global Issues* is designed to “help students understand complex global issues and sustainable solutions, and offers creative tools for them to take action in their local and global community.” Overall, this curriculum is notable because the content is relevant to our target population, is delivered in an interactive and very accessible manner, and focuses on economic and social inequality in both a global and local context.

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More information is available at www.facingthefuture.org

Green Steps School

Green Steps School is an environmental education initiative and curriculum that encourages individual schools (in South Carolina) to take steps towards becoming more environmentally responsible. This curriculum is designed for school administrators who want to empower their students to conserve energy and water, reduce waste, and save money through environmentally-conscious purchasing and behavioral change in their school. It is user friendly, designed for a range of academic literacy levels, interactive, and focused on putting programs in place to reduce energy and water use in the schools. Overall, the curriculum and program requires extensive buy in, support, and financial resources of top administrators but it could be adapted for a prison setting by instructors working with the support of prison administrators.

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More information is available at www.greenstepsschools.com

Leave No Trace

Leave No Trace is produced by the Center for Outdoor Ethics. It is designed to increase awareness about the importance of protecting parks and recreation areas from the problems stemming from heavy human use. It focuses on how to camp safely and responsibly, carefully pack garbage, and minimize the negative impact on the outdoor environment. The curriculum focuses on being outdoors in nature and hiking. The exercises are designed to accompany a nine minute video on responsible outdoor behavior. The video is nature oriented, but with an urban population focus; visually it is dynamic and fast paced. Although the curriculum is designed to be used outdoors, some of the exercises can be adapted for indoor use by having the students imagine that they are outdoors. Overall, a couple of the imaginary exercises might be useful but it is not generally relevant to the lives of people who are incarcerated. Some of the ideas and exercises in this curriculum might be useful to get the prison population thinking about the environment. At its best,

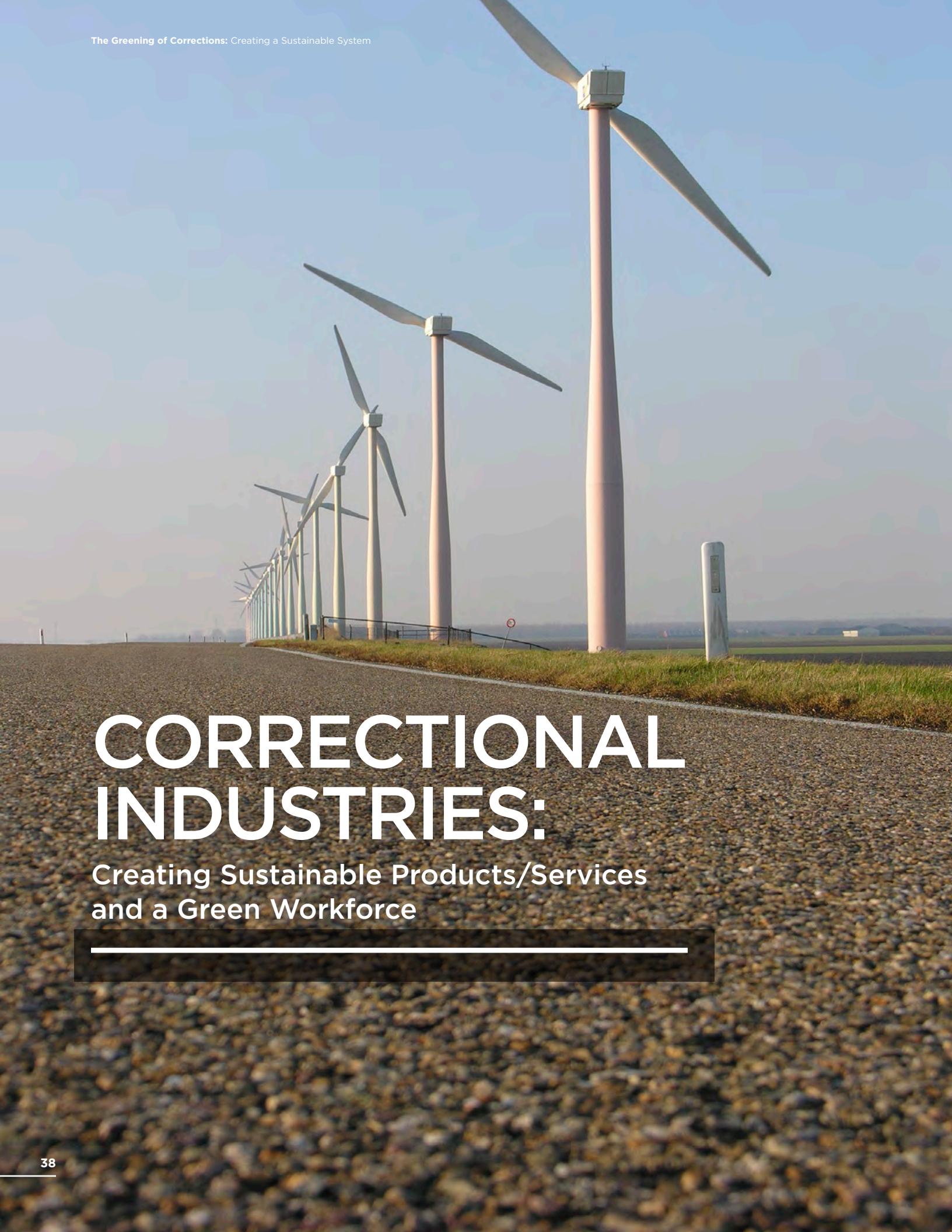
this curriculum could inspire and support the target population to explore the natural world and use their region's parks and open spaces upon reentry.

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More information is available at www.int.org

Roots of Success

Roots of Success is designed specifically for youth and young adults participating in a green job training program. This curriculum is designed for people with limited proficiency in English, math, science and/or computer skills and, for this reason, is designed to "teach environmental literacy while enhancing academic literacy and job readiness skills. It is ideally suited to support youth and adults being trained for jobs and careers in the green economy." The curriculum is divided into six thematic modules, plus an introduction and conclusion - water, waste, transportation, energy, building and food & agriculture. Each module can be taught in four hours. This curriculum is only available for purchase and requires instructors to be trained and certified. Once trained, it is easy to use. Instructors can use as many or as few of the modules as desired. Instructors teach the curriculum using a scripted Instructors Manual and DVD that includes visuals and videos. Each student receives a Student Workbook that includes all of the exercises and activities needed for the course. Overall, this curriculum is extremely useful for the target population especially because it is designed to teach environmental literacy while enhancing academic literacy and job readiness, focuses on both environmental and social issues, and focuses heavily on helping students to identify and prepare for green jobs. This curriculum is available in both English and Spanish.

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More information is available at www.rootsofsuccess.org/qa

A photograph of a wind farm. In the foreground, a paved road curves from the left towards the right. A row of white wind turbines with three blades each stands along the side of the road. The turbines are angled towards the left. The background shows a vast, flat landscape under a blue sky with scattered white clouds.

CORRECTIONAL INDUSTRIES:

Creating Sustainable Products/Services
and a Green Workforce

Correctional Industries (CI), defined as the work programs in correctional facilities that provide real world work experience to inmates, teaching them transferable job skills and work ethic to help them prepare for post-release reentry and employment,³⁵ are increasingly becoming part of the growing momentum for action on sustainability and green workforce development. Across the country, many CI programs are involved in sustainability efforts, ranging from creating core business strategies for sustainable production processes and practices, developing new strategic partnerships, producing and distributing environmentally-friendly products and services and preparing prisoners for the most relevant skills for the emerging green economy.

The Green CI Landscape

To understand the current landscape of green CI, a survey of members of the National Correctional Industries Association (NCIA) was conducted, yielding 25 responses representing 19 states. In addition, two focus groups were conducted with 14 NCIA members. The survey and focus groups sought to uncover information about: current green prison industry work programs, green products, manufacturing processes and services being created through environmentally sustainable practices, current environmental literacy curricula and training, green skills and competencies acquired through work experiences, future plans for greening prison industry programs, and internal and external institutional barriers to the adoption of green CI programs.

CI programs were motivated to initiate green prison industry programs (see chart 3) for a variety of reasons, according to survey and focus group results, including 1) responsiveness to customer demand, 2) creation of revenue and diversification of offerings, 3) better reputation/public relations/contribution to sustainability, 4) provide inmates with new and relevant job training opportunities, 5) new state mandates, regulations, or new funding, and 6) cost savings.



Chart 3: Correctional Industries' Motivations for Going Green

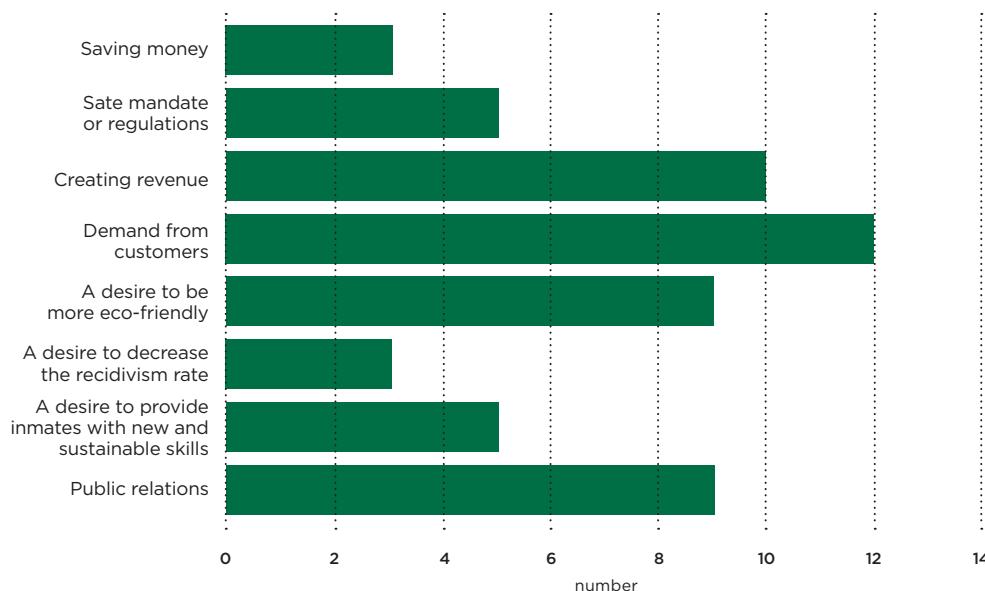




Photo provided by National Correction Industries Association

Although CI programs were motivated to go green for a variety of reasons, green CI programs still involve only a small proportion of inmates and revenue generated. According to the survey results, the average number of

inmates engaged in state prison industry programs was approximately 1,800 inmates per state, with a majority reporting that the total number of inmates engaged in their green programs represented 25 percent or fewer of inmates involved in CI. More than 70 percent of survey respondents reported that, as a percentage of the total revenue, only five percent or less was created by green industries. Less than a quarter indicated that their green programs generated between six and 10 percent of total revenue, and only one respondent stated that green industries generated between 16 and 20 percent of prison industry revenue.

Green Strategies, Processes, and Products

The largest prison industries programs, based on both number of prisoners involved and the amount of revenue generated, were: garments/textiles, furniture/office systems, farming/agribusiness, license plates, highway landscaping, and cleaning supplies/janitorial products. Examples of green prison industry programs included a bio-mass plant to produce sustainable electricity, methane gas that was produced from agricultural waste, and solar panel/PV installation and production, landscaping and green roofs, shoreline restoration, and developing a line of green cleaning products. Further, license plate production was mentioned as another example of how prison industries deployed green strategies; new methods of production that end the use of high VOC inks by using a dry ink machine and an UVI cured ink, eliminating the need for a dry off oven and reducing hazardous waste, and utilizing recycled aluminum from steel. Many survey respondents also stated that they were making their production processes more environmentally friendly or using fewer natural resources. These efforts

included: utilizing recycled materials in office systems manufacturing, refurbishing old office furniture, metal fabrication, windmills, and playground equipment.

Product Certification

Two-thirds of survey respondents reported either having products or programs certified by entities such as Green Seal or GREENGUARD or pursuing these certifications. Respondents indicated, however, that the variation in certification requirements is a source of confusion for their prison industries and the costs of certification could be a barrier. One survey respondent stated: “We offer products with components that are certified by suppliers, e. g. 100 percent postconsumer fabric. ‘Green certified’ is not a fixed standard, and there are literally dozens of organizations offering certifications of different kinds. It all depends on the clients’ needs what certification is desired.”

Internal and External Partnerships

Many focus group participants spoke of the importance of partnerships with their vendors to their green efforts. For many participants, the vendors facilitated the certification process for green products and played a key role for the prison industries in providing information about specific green industries. One focus group participant spoke highly of his facility’s vendor for solar panels, whose “knowledge of the industry was critical for us to understand how the whole supply chain works.” Just under a third of survey respondents (28.6%) indicated having key strategic partnerships for launching and sustaining their green industry efforts.

Skill Development

Focus group participants talked about the importance of preparing inmates for entry-level green jobs, but few elaborated on the connection between their prison industries and preparation for green jobs on the outside of prison. Several participants stated that the job skills gained in green industries are the same as those gained in other industries, with the added benefit of the development of an awareness of environmentally sustainable processes. Only 10 percent of survey respondents indicated that their green efforts were linked to the educational or vocational programming in their facilities.¹⁵

UNICOR/Federal Prison Industries (FPI)

Correctional industries programs can play a significant role in supporting green corrections. They support their government agency customer base through a supply chain focus on green purchases of goods and services. Executive Orders 13423 and 13514 set goals for the Federal Government in energy efficiency, renewable energy, toxic reductions, and recycling. To help Federal Government agencies meet these goals, Federal Prison Industries (FPI) has adopted green manufacturing processes in its various products sold to the federal government.

FPI is a wholly-owned government corporation established by Congress in 1934. FPI's mission is to employ and provide job skills training to the greatest practicable number of inmates confined within the Federal Bureau of Prisons.

Several FPI business group green efforts include:

- Many FPI Office Furniture Group (OFG) products are not only fully compliant with the standards of the U.S. Green Building Council's GREENGUARD Certification, but they also comply with the Business and Institutional Furniture Manufacturer's Association low emitting furniture standards. Fabrics used in OFG furniture comprise up to 100 percent recycled fiber content, and all foam cushioning used in OFG seating is 100 percent recyclable. All finishes and glues are water based and environmentally safe.
- FPI provides a complete range of fleet modernization programs to the Federal Government. Through a reclamation and rebuilding program, FPI saves customers up to 60 percent of their procurement dollars, as compared to the cost of buying new equipment.
- FPI's Industrial Products Group (IPG) employs a number of environmentally sound processes, such as using only powder coated paint finishes. Along with being non-toxic, excess powder coated paint can be retrieved and used again. IPG also practices environmentally sound processes to produce decals and screen printed emblems, and uses inks that are chemically inert.
- In the FPI Services Business Group (SBG), inmates working in FPI's data program convert tens of thousands of pages of documents to electronic format each day, providing government agencies a cost effective and environmentally sound way to capture and retrieve valuable data. SBG print shops use only environmentally safe inks. Last year, SBG printing and bindery operations returned over 650 tons of waste to the paper market for the production of new products.
- FPI's Recycling Business Group processes millions of pounds of obsolete and excess computers and electronic equipment annually from both the public and private sectors. This action saves precious landfill space, energy, and resources, by reusing residual materials in lieu of mining virgin commodities. If an item cannot be re-used, it is broken down into recyclable component parts.
- Recently, FPI began manufacturing operations to provide solar panels to the Federal government. Providing this technology to federal agencies will enable them to become more environmentally sound and energy efficient to meet their goals.
- FPI has embraced the importance of "Greening" as an organizational goal as well. FPI's FY 2011 Strategic Plan includes the following objective: Promote environmental and occupational health stewardship by operating the corporation in a compliant, environmental friendly and sustainable manner.
- One strategy to meet this objective is for FPI to emphasize current efforts and increase focus on "green" products, product sustainability, and recycled content. However, FPI will not just promote greening through its products. Inmates who learn how to care for the environment by working in FPI will take that knowledge with them when they return to society.



Photo provided by UNICOR



Photo from the Wisconsin Department of Corrections website

WISCONSIN BUREAU OF CORRECTIONAL ENTERPRISES

Wisconsin's Bureau of Correctional Enterprises (BCE) offers vocational training and work skills development to inmates in the state's correctional facilities. Three Wisconsin facilities have produced seating and systems furniture that meet standards for GREENGUARD indoor quality certification. The GREENGUARD certification is a complex process requiring that component parts, supplied by an outside manufacturer, meet standards of sustainable practice. BCE's investment in the licensing fee and painstaking inspections process for GREENGUARD certification has paid off with the Bureau's primary customer base. End consumers of these Correctional Enterprises products can use their GREENGUARD-certified furniture in pursuit of LEED certification for the building overall. In fact, the University of Wisconsin, BCE's primary consumer, has mandated that all furniture purchased by the university system be GREENGUARD-certified by 2010.

Response to this consumer demand was a crucial motivator for Wisconsin's Bureau of Correctional Enterprises to go green. Greening BCE's furniture manufacturing processes has met a trio of goals according to Robert Smith, Wisconsin Badger State Enterprises Furniture Superintendent: BCE seeks to respond to customer needs, usually those of state agencies, while meeting the Bureau's mission to provide jobs and training that will enhance inmates' marketable skills. And, not least, says Smith, "We think it's the right thing to do." Demand from state agencies has continued to be strong despite steep cuts in state budgets. GREENGUARD-certified furniture production is not Wisconsin's sole foray into greening its correctional industries. Inmates in two facilities de-manufacture computers for recycling of component parts or re-manufacture them for donation or sale at a price of \$50 to community organizations. One facility also offers recovery of highway signage. Using a hydrostripper, inmates are able to achieve 80 percent recovery of sign blanks, a money-saving prospect that is popular with counties. Two prison laundries staffed by offenders have used ozone generators to inject and treat wash water with ozone. This process, while teaching inmates new skills, has the neat side effect of reducing hot water costs by up to 90 percent. These greener practices in Wisconsin's correctional facilities are "absolutely" revenue-generating, according to Smith. All of BCE's programs are program revenue funded, meaning that the Bureau can only spend what it takes in. Even with a sometimes low profit margin, this program revenue funded model means that BCE's green initiatives are inherently sustainable in every sense of the word.

To learn more about Wisconsin's initiatives to green Correctional Enterprises, see <http://www.buybsi.com> or contact Robert Smith, Wisconsin Badger State Enterprises Furniture Superintendent, at Robert.Smith@Wisconsin.gov

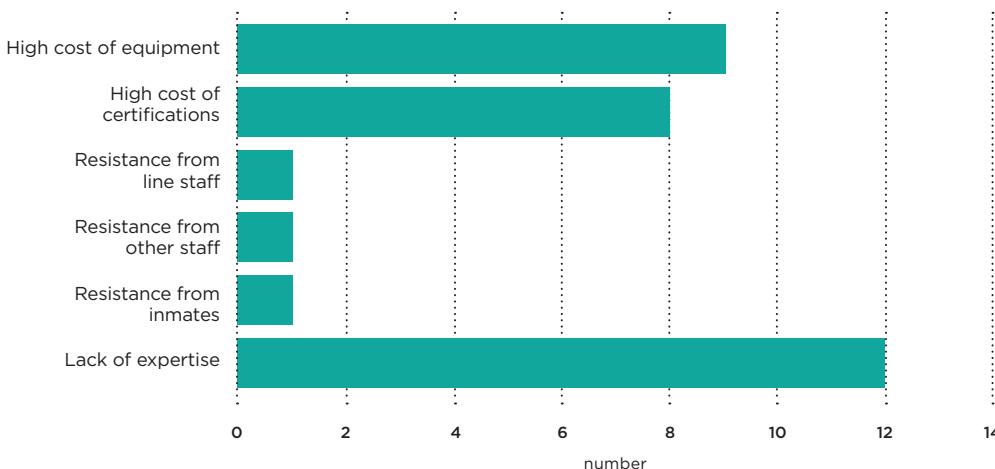
Barriers to “Going Green”

There were multiple barriers identified by CI programs for going green (see chart 4), according to survey and focus group participants. These barriers included high costs of certifications of green products and the high price of finished green products. Similarly to the results of the ASCA survey, CI respondents stated that lack of expertise and high costs of equipment are barriers to the development and implementation of green industries in their facilities. Despite the barriers, over three-fourths of survey respondents (76.2 percent) and a majority of focus group participants indicated that they were interested in pursuing strategies that would result in green manufacturing processes and products.

Some of the CI leaders that had embarked on sustainability practices put forth recommendations for administrators who were interested in incorporating green practices into their prison industry programs. Survey respondents emphasized the importance of partnerships. One respondent stated, “Find the right organization willing to partner together who will be committed to serving the inmates within your state, while having a sustainable business that is in alignment with the values and principles of Correctional Industries.” Another respondent pointed out the importance of partnering with vendors to reduce the cost of green certifications.¹⁵

One survey respondent’s recommendation was: “Concentrate on meaningful, sensible programs and products that will provide a long term contribution to sustainable products. Find out what the purchasing mandates of the majority of your clients. That will allow you to manage production to what people want to buy, in the sustainable or green product field.” Focus group participants emphasized the importance of marketing strategies for developing successful green efforts. Survey respondents also emphasized the importance of education on green strategies for all parties involved in prison industries. Another respondent stated, “involve production, purchasing, sales and your existing client base as much as possible in ‘green’ training, so that each can communicate their needs in the same terminology, and with similar expectations of what is possible.”

Chart 4: Barriers to Going Green



“...CI respondents stated that lack of expertise and high costs of equipment are barriers to the development and implementation of green industries in their facilities.”



GREEN REENTRY PROGRAMS

Each year, approximately 700,000 people are released from state and federal prisons, returning to communities across the nation.³⁶ An even greater number re-enter society from local jails, an event that, for some individuals, may occur multiple times in one year.³⁶ Most people released from correctional facilities face multiple barriers to successful reentry including employment, substance abuse, housing, mental health and health related issues. Successful reentry requires strong community support networks and comprehensive services, particularly because the level of services needed cannot be provided through prison or jail terms due to resource constraints and other issues.

Finding and maintaining a job is a critical dimension for successful reentry and many programs

across the country are beginning to look at the potential of the green economy to understand how it relates to individuals who have low levels of education, limited work experience and vocational skills, and face a general reluctance by employers to hire people with convictions. Many programs are reconfiguring their programs to integrate new green skills and competencies or creating new programs driven by an increased demand for green goods and services in the marketplace. Formerly incarcerated individuals are gaining skills and being trained for a range of jobs including recycling, brownfields remediation, landscaping, energy efficiency retrofitting, and deconstruction to stem the high rates of recidivism. Three such programs are highlighted.

Safer Foundation Chicago, IL

The Safer Foundation (Safer) works to reduce recidivism in communities in Illinois and Iowa. Combining job training and preparation, education, and support services, such as housing and substance abuse treatment, Safer boasts a recidivism rate of just 13 percent for clients, compared to 52 percent for the state of Illinois. Job training and preparation are critical elements to Safer's strategy and green jobs training is becoming increasingly important part of their programming. Safer has developed two programs to prepare individuals for green jobs: Deconstruction Work Services and Urban Landscaping.

Deconstruction Work Services spins standard construction training and work on its head. Safer clients learn how to take apart a building, rather than construct or renovate a building. Deconstruction is the "controlled demolition of condemned buildings" and is becoming increasingly popular as people see the financial and environmental benefits of reusing building materials. For Safer, The ReUse Institute provides basic deconstruction training to clients. Other partner organizations provide hazardous waste and OSHA training, a standard requirement for entry-level construction jobs. Clients then practice their newly acquired deconstruction skills on real buildings. The Delta Institute, a partner organization, operates a store selling the reused building materials. Clients work in the store and learn about retail operations and customer service, increasing their marketability when job searching and interviewing. Through these trainings and on-the-job experiences clients are ready for construction jobs, which are traditionally accessible to people with criminal records.



Photo provided by Safer Foundation

Safer, in partnership with the Garfield Park Conservatory Alliance (GPCA) and Christy Weber Landscapes (CWL), also operates an Urban Landscaping Project. Funded through the City of Chicago's Department of Environment, the initiative allows Safer clients to landscape and enhance vacant parcels and establish community and indoor agricultural gardens in their own neighborhoods. Clients working on this project are part of the Safer Return demonstration project and become invested in their own neighborhoods for successful reentry. Projects directly align with the goals of the Chicago Climate Action Plan and two green industry areas—Sustainable Landscaping/Local Agriculture and Community Horticulture. Over time, Safer believes clients will become reinvested in their communities and prepared for green jobs.

Civic Works

Baltimore, MD

Founded in 1993 and located in Baltimore, Maryland, Civic Works functions as the city's urban service corps and AmeriCorps program. In 2001, Civic Works began their Green Career Pathways project, including the B'More Green Brownfields mitigation program, EnergyReady cool roof and energy efficiency program, and the newest B'More Green Energy Efficiency Retrofit program. The B'More Green Brownfields job training program connects unemployed, underemployed and previously incarcerated Baltimore residents with jobs created as a result of brownfields redevelopment and environmental clean-up projects. Trainees receive 7 industry recognized environmental health and safety certifications. Since 2003, the program has graduated 16 classes.

EnergyReady, launched at the end of 2008, is a full-service home performance social enterprise that builds upon Civic Works' extensive experience in residential construction and sustainability. EnergyReady has a 3-year, \$1.4 million weatherization contract with the City of Baltimore, performing energy efficiency retrofits in low-income communities with grants from Community Development Block Grant (CDBG) and the Maryland Energy Administration. EnergyReady also competes for home performance contracts in the private market.

In 2010, Civic Works started the B'More Green Energy Efficiency Retrofit Program, an energy retrofit crew comprised of trainees. Trainees will complete one month of classroom training, including the DOE Weatherization Worker certification, the OSHA 10-hour Construction Safety Certification, and the EPA Lead Renovator certification. The classroom training will



also include basic job readiness training and extensive hands-on training in a DOE approved work simulation lab. After completing the training, participants will receive two months of paid on-the-job training while working on real contracts with the EnergyReady social enterprise.

Vermont Works for Women

Winooski, VT

Photo provided by Vermont Works for Women



Vermont Works for Women (VWW) works to address the needs of economically vulnerable women and girls living in Vermont to earn a livable wage and to succeed in employment, including women incarcerated in Vermont's women's correctional facility. VWW programs enroll over 900 women and girls a year, most of whom, if not incarcerated at the time of enrollment, have previously been so.

VWW offers support services through several programs: mentoring, job training while incarcerated, pre-release employment support, post-release transitional jobs, social venture on-the-job training, and, currently in development, a transitional housing unit. VWW's green jobs training program includes the Modular Home Building Program, an in-prison program with a green building curriculum, where incarcerated women build Energy Star modular homes inside of

Vermont's Women's Correctional Facility. The program offers year-round job training for participants in finish and frame carpentry, electrical wiring, plumbing, weatherization and roofing. Through the process of building modular homes, women receive skill-based training in green carpentry that is transferable to the workplace outside of prison. The program has seen promising success: of participants released from prison and eligible to work, 75 percent found employment and 76 percent were able to retain that work. The program as a whole boasts a 19 percent recidivism rate (compared with 51 percent for the general female incarcerated population.)

In October 2009, in partnership with a private sector manufacturer and contractor, VWW launched a solar tracker installation and weatherization social venture called FRESH, that employs people with criminal histories in transitional jobs. The program provides year-round training in these emerging green fields, while offering the social service support needed for successful re-entry into society and, ultimately, the unsubsidized workforce.

RECOMMENDATIONS FOR GREENING PRISONS AND JAILS

The development and implementation of a comprehensive sustainability strategy for correctional facilities may seem like a daunting task at first, but the path to sustainability is not only technically feasible, but can also save the institution substantial amounts of money, contribute to society and, at the same time, prepare and train prisoners with relevant skills and competencies in the emerging green economy. To that end, the following are a set of recommendations based on the experiences and suggestions from early adopters and innovators in the field.

RECOMMENDATION 1: Create a Sustainability Work Group

Create a local multi-disciplinary sustainability team. Include plant maintenance, budget, vocational and education programming, and unit and custody staff.

Charge the team with developing strategies to manage performance expectations and look for ways to incorporate sustainability into budget reduction strategies and offender training and employment programs.

Find people with passion around the issues of the environment and environmental stewardship.

Collaboratively develop a green strategic plan or green paper that is agency specific.

RECOMMENDATION 2: Hold a Retreat for Your Executive Team

Provide participants an overview of sustainable practices in prisons.

Ask for their ideas and opinions to get buy-in.

Involve local experts and possible strategic partners where they exist.

Clearly lay out the rationale for embarking on these practices and develop a smart business strategy that assists in reducing costs, employing offenders, and engaging community partners.

RECOMMENDATION 3: Implement Budget Savings Strategies & Offender Employment Opportunities

Mine your waste: Recycling, garbage sorting centers, and composting will reduce operating costs and employ offenders. Dumpster dive and discover what you purchase that you simply throw away.

Support Local Partnerships: Restore used bicycles for community organizations, grow starter plants for Kiwanis clubs, start gardens to both off-set food costs and provide produce to local food shelters.

Implement Transportation Demand Management: Reduce fleet size, use electric, hybrid, or flex-fuel vehicles, switch to biofuels, buy locally, and promote carpooling between staff members.

Cell Dog Programs: Partner with local dog shelters. This initiative will reduce violence in prisons while also teaching skills like empathy, compassion, responsibility, and saving animals.

Look for Scientific Projects: Partner with local liberal arts colleges and/or military bases. Many military bases are beginning to restore biodiversity within their compounds.

Utilize Local and Regional Expertise and Resources: Partner with organizations such as community colleges, employers, and the public workforce system for green training - their expertise may bring you access to resources such as best practices, technical support, curricula, and other important information and services.

Work With Anything Alive: bee hives, vermicomposting, dogs, cats, etc.; it builds character, morale, and empathy for prisoners and provides opportunities for personal development.

Offender e-mail: Use email instead of regular mail – it improves staff safety, reduces workload and reduces the amount of paper used and in cells.

RECOMMENDATION 4: Performance Management: Inspect What You Expect

Establish a performance management system within your facility or agency. There are many systems out there in use in different jurisdictions, so simply pick a model.

Once a system is adopted, establish baseline data in sustainable categories such as energy (gasoline, diesel, electric, natural gas), solid waste, recycling, water use, gardening and other innovation programs.

Publish the data on a monthly or quarterly basis and require program managers or wardens to respond on how they are trying to meet performance targets.

Consistent use of the targets over time will change behavior; it is a powerful tool.

CONCLUSION:

The Sustainable Correctional/Detention Facility of the Future



As executives and staff in the corrections field plan to create more efficient, resilient, and sustainable correctional/detention facilities, it may be useful to begin with a vision of the sustainable jail or prison of the future. The jail or prison of the future would most likely look quite different from each other, both literally and figuratively, with certain common transformational elements and commitments.

The jail or detention facility would likely be urban, vertical, and part of a neighborhood, quite possibly part of a civic center; the prison, on the other hand, would more likely be rural or suburban, therefore more horizontal, and economical to construct. In both cases their appearance would communicate a civic and institutional purpose, not specifically punitive, focused on creating active, valued citizens and breaking the cycle of recidivism. Traditional elements of secure design such as massive masonry, slit windows, razor ribbon, watch towers, and the like can be supplemented with more subtle and civic techniques to present the facility of the future as a good neighbor. The physical space would also reflect the daily experience of inmates acting as responsible citizens prepared to create a better physical environment, both while in prison and after exiting.

The opportunity to use sustainable features to define the image of the buildings themselves is a key strategy in communicating the green mission of the facility. PV electricity generators can be integrated with the wall and roof enclosure systems so that they are not viewed as “add-ons” but part of the building. Similarly the notion of the green roof can be extended beyond the simple roof to include vertical surfaces and become locations for gardening and food production job training programs. Added windows for daylight harvesting support the notion of the jail or prison of the future as more open, humane, and “normal” in its treatment of those confined within.

Using the buildings themselves to define the secure perimeter eliminates the need for the most fear inducing element of traditional correctional design: the razor ribbon perimeter fence. Expensive to construct and maintain, the double layer fence creates a boundary around a campus that keeps inmates in and intruders out. Both of these goals can be achieved with greater economy using the building walls. The site perimeter can then be defined with a more normal perimeter fence, or by a planting boundary. Within the site perimeter, more restrictive outdoor zones for high risk prisoners can be defined by simple barrier fencing. This “layered” approach allows the facility to be viewed by neighbors as a more normal part of the community.

While the operations of a jail and a prison are markedly different, they can share a common commitment to providing opportunities for green activities. The urban detention center is a hive of constant activity with new arrivals, releases, out to court, and a “fresh off the street” demeanor to the residents; the sentenced facility would be more stable in turnover, with a longer term outlook for the inmates, an emphasis on routine, and with a great need to bring meaningful activity to the day. In both cases these activities can be based around green



Photo provided by Washington State Department of Corrections

education and training activities like gardening and recycling, construction, and manufacturing. Classes focused on GED or basic skills training can integrate environmental concepts as they provide contextualized learning to inmates.

What both types of facilities have historically had in common is high resource consumption due to the density of occupation, 24/7 operation, high water use, heavy waste stream, and an abundance of low cost labor.

"Personal responsibility is necessary to reduce consumption of water and other waste—an important lesson for inmates to apply once they leave the prison system."

The notion of linking green or sustainable activities to the operational program of these secure facilities has great resonance with traditions of farming, craft activities, and the like that were abandoned in many cases during the period of great growth in prison populations at the end of the 20th century.

Linking a sustainable conception of the facility to these newly relevant activities suggests a new model that is net zero energy consumption, net zero waste, and which releases environmentally literate individuals with green skills that benefit their communities, their families, and themselves. The notion that the inmates' behavior can be corrected through programs designed to give the person tools to reenter society better equipped to be a productive citizen is a deeper layer in the conception of greening corrections. In many ways the idea of greening corrections ties together the initiatives of the program enriched direct supervision unit management concept, and the outcomes focused re-entry programs with the green movement's emphasis on the effect of buildings on the environment. That the numbers of the incarcerated have grown so greatly so quickly, that the densely populated, intensively used buildings consume resources so voraciously, and that they house

individuals at once vulnerable and dangerous makes a holistic approach so important.

A green jail/prison of the future could take the following integrated approach:

The Direct Supervision environment within the facility is calm and secure, with staff and detainees/inmates safe from threat of harm, in spaces that are quiet, clean, full of daylight, and with ample access to meaningful activities. Services (counseling, meals, recreation, visiting, medical, programs) occur directly adjacent to the housing unit, so staff escort is only required when detainees/inmates leave the facility. The introduction of daylight into all occupied spaces, often with views to nature, is key to saving lighting costs, creating a humane environment that can reduce aggressiveness for both staff and detainee/inmate, and, when properly planned, providing passive heating in winter.

Planning for successful reentry to society, which applies to 95 percent of all inmates, begins for each detainee/inmate upon admission to the facility. For short stay individuals, only minor interventions are possible, but with alternatives to incarceration offered to qualified offenders in cooperation with Community Courts, more positive outcomes can be anticipated for even those who serve short or no sentences. For sentenced individuals, the full array of educational, behavioral, job training, mental health, and environmental literacy interventions can be delivered over time to change attitudes and affect outcomes. The full range of education and training opportunities to help with successful reentry will provide the relevant skills and competencies needed for a variety of occupations and sectors in the emerging green economy, including postsecondary education and credentials to allow prisoners to gain a family-sustaining job.

Connected to those interventions is utilizing sustainability efforts in prison to serve as a living laboratory to allow prisoners to gain valuable work

experience. These work experiences will be taught in conjunction with environmental literacy so prisoners can understand the context in which they work and connect to a cause greater than themselves. The notion of greening corrections is holistic and inclusive of traditional building oriented sustainable techniques as well as embracing the social dimension. The goal of “correction” of deviant behavior is at the foundation of our justice system since its inception in the 19th century, and in spite of the “tough on

crime” naysayers, great strides have been made in evidence-based techniques to intervene and produce positive outcomes. The green principles of zero waste, renewal, and recycling and the practices of sustainable hands-on work experience and green education and training programs are completely in sync with these traditions. The facilities now in development have the opportunity to demonstrate that the jail/prison can contribute to the health and sustainability of the communities and the people they serve.



Appendix A: List of Resources

National Green Organizations

American Council for an Energy-Efficient Economy (ACEEE)

This national organization provides economic data, research findings, and policy recommendations on energy efficiency, renewable energy, climate change, and environmental issues.

www.aceee.org

American Public Power Association (APPA)

APPA offers a summary of Clean Renewable Energy Bonds (CREBs), a financing mechanism available through the Internal Revenue Service for public-sector renewable energy installations.

www.appanet.org/files/PDFs/CREB.pdf

American Wind Energy Association (AWEA)

The American Wind Energy Association is a trade and advocacy organization that represents the U.S. wind energy industry and individuals who support clean energy.

www.awea.org

Apollo Alliance

The Apollo Alliance is a coalition of business, labor, environmental, and community leaders working to catalyze a clean energy revolution in America to reduce the nation's dependence on foreign oil, cut the carbon emissions that are destabilizing our climate, and expand opportunities for American businesses and workers.

www.apolloalliance.org

Blue Green Alliance

Launched in 2006, the Blue Green Alliance is a strategic initiative led by the United Steelworkers and partners. The alliance focuses on three key issues: global warming and clean energy; fair trade; and reducing toxics.

www.bluegreenalliance.org

Center on Wisconsin Strategy (COWS)

COWS is a national policy center and field laboratory for high-road economic development—a competitive market economy of shared prosperity, environmental sustainability, and capable democratic government.

www.cows.org

The Corps Network

The Corps Network is the voice of the nation's 136 Service and Conservation Corps. Currently operating in 42 states and District of Columbia, the Corps annual enrolls more than 26,000 young men and women in service. Service and Conservation Corps provide a wealth of conservation, infrastructure improvement, and human service projects.

www.corpsnetwork.org

Database of State Incentives for Renewables and Efficiency (DSIRE)

DSIRE provides comprehensive information on renewable energy and energy-efficiency incentives available through federal, state and local government, and public utilities.

www.dsireusa.org

Green Buildings Online LLC

Green Building is an education and training organization preparing individuals and organizations for LEED Certification, and provides expert advice about training, green products and topics related to commercial green buildings.

www.green-buildings.com

Green for All

Green for All is a national organization dedicated to building an inclusive green economy strong enough to lift people out of poverty. Green for All advocates for local, state, and federal commitment to jobs creation, job training, and entrepreneurial opportunities in the emerging green economy—especially for people from disadvantaged communities – to fight both poverty and pollution.

www.greenforall.org

GreenPrisons.org

GreenPrisons.org is the online source for what's happening in environmentally responsible, corrections-related, programs and services. GreenPrisons invites agency administrators to share their green projects with the rest of the profession so that we can all learn from your successes as well as some of your challenges

www.greenprisons.org

Interstate Renewable Energy Council (IREC)

IREC is a nonprofit organization dedicated to expanding the adoption and use of renewable energy sources and technologies. Its workforce development initiatives include efforts to create competency and certification standards for renewable energy professionals and training programs.

www.irecusa.org

North American Board of Certified Energy Practitioners (NABCEP)

The North American Board of Certified Energy Practitioners (NABCEP) provides photovoltaic and solar thermal installation certification. Designed to raise industry standards and promote consumer confidence, NABCEP offers certification and certificate programs to renewable energy professionals throughout North America.

www.nabcep.org

Partnership for Environmental Technology Education (PETE)

PETE's mission is to provide leadership in environmental technology training and education at community and technical colleges. It offers model curricula and other instructional resources.

www.ateec.org/pete

Pew Center on Global Climate Change

The Pew Center on Global Climate Change brings together business leaders, policymakers, scientists, and other experts to bring a new approach to a complex and often controversial issue. Pew's approach is based on sound science, straight talk, and a belief that we can work together to protect the climate while sustaining economic growth.

www.pewclimate.org

Sustainability Education and Economic Development (SEED) Center

The SEED Center is a leadership initiative and resource center created by the American Association of Community Colleges and ecoAmerica that will provide strategic guidance and detailed resources for community colleges to dramatically ramp-up their programs to educate America's 21st century workforce.

<http://www.theseedcenter.org>

U.S. Green Building Council

The U.S. Green Building Council (USGBC) is a nonprofit community of leaders working to make green buildings available to everyone within a generation. The USGBC developed and houses the Leadership in Energy and Environmental Design (LEED) certification programs.

www.usgbc.org

Government Resources

U.S. Department of Education

The 2009 report from the U.S. Department of Education's Office of Vocational and Adult Education (OVAE) identifies partnerships between community colleges and prisons and identifies the partnership process and effective practices.

http://www2.ed.gov/about/offices/list/ovae/pi/AdultEd/prison-cc-partnerships_2009.pdf

U.S. Department of Energy

The Department of Energy has numerous programs and resources that can be helpful in the greening of corrections. Some of these include:

Commercial Building Energy Consumption Survey

The Commercial Buildings Energy Consumption Survey, operated by the U.S. Energy Information Administration, is a national sample survey that collects information on the stock of U.S. commercial buildings, their energy-related building characteristics, and their energy consumption and expenditures.

<http://www.eia.doe.gov/emeu/cbecs/>

National Renewable Energy Laboratory

The National Renewable Energy Laboratory is the only federal laboratory dedicated to the research, development, commercialization and deployment of renewable energy and energy efficiency technologies.

www.nrel.gov

National Weatherization Training Portal

The National Weatherization Training Portal, housed in the Department of Energy, features multi-media, interactive, self-paced training modules. While this training portal will not replace the need for formal, hands-on-training, it will enhance or augment the training conducted across the country.

<https://trainingportal.ee.doe.gov>

Office of Energy Efficiency and Renewable Energy (EERE)

EERE sponsors various initiatives to build awareness about energy efficiency and renewable energy topics and to coordinate efforts toward specific goals.

www.eere.energy.gov

U.S. Environmental Protection Agency (EPA)

ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy helping us all save money and protect the environment through energy efficient products and practices.

www.energystar.gov

U.S. Department of Justice

The National Institute of Corrections, under the Bureau of Prisons in the U.S. Department of Justice, provides training, technical assistance, information services, and policy/program development assistance to federal, state, and local corrections agencies.

www.nicic.gov

U.S Department of Labor

The Department of Labor provides resources that can help correctional facility staff assess the labor market and develop appropriate job training programs. Some of these resources include:

Bureau of Labor Statistics

The Bureau of Labor Statistics has recently developed and implemented the collection of new data on green jobs with the goals of developing information on 1) the number of and trend over time in green jobs, 2) the industrial, occupational, and geographic distribution of the jobs, and 3) the wages of workers in these jobs.

www.bls.gov/green

Employment and Training Administration

The Employment and Training Administration administers federal government job training and worker dislocation programs, federal grants to states for public employment service programs , and unemployment insurance benefits.

www.doleta.gov

Green Jobs: Building Pathways for a Green Workforce

The Green Jobs website is a community of practice developed by the Department of Labor and serves as a platform for workforce professionals and green job thought leaders to discuss and share promising practices to create partnerships for Green Job Workforce Solutions.

<https://greenjobs.workforce3one.org/page/home>

O*NET OnLine

O*Net OnLine, operated by the U.S. Department of Labor, has detailed descriptions of the world of work for use by job seekers, workforce development and HR professionals, students, and researchers.

www.online.onetcenter.org

General Services Administration

The General Services Administration (GSA) uses expertise to provide innovative solutions for customers in support of their missions and by so doing foster an effective, sustainable, and transparent government for the American people. GSA provides a variety of procurement solutions for federal agencies.

www.gsa.gov

Appendix B: The Current Landscape of Green Corrections

John Jay College of Criminal Justice, Prisoner Reentry Institute assessed and analyzed the current landscape of environmental awareness and green education training programs in the correctional field through surveys, focus groups, and in-depth interviews. The members of the Association of State Correctional Administrators (ASCA) and the National Correctional Industries Association (NCIA) were asked to participate in electronic surveys and a convenience sample of NCIA members participated in two focus groups during the organization's annual meeting.

Green Educational And Vocational Training Programs: A Survey Of ASCA Members responding to ASCA Survey

The survey of members of the Association of State Correctional Administrators (ASCA) yielded 49 responses representing 34 states. The survey was designed to identify existing and/or new green educational and vocational training opportunities in correctional settings, as well as to develop an understanding of the ways in which environmental literacy is integrated into existing curricula. Survey respondents were also asked about the availability of certificate or credentialing opportunities for green-related skills in their facilities, and any existing partnerships utilized to facilitate these programs. Survey questions also sought to uncover both the motivations for integrating green practices into correctional education and training programs, and the internal and external barriers to doing so, as perceived by the administrators.

States responding to ASCA Survey:

Alabama	Arizona	Colorado	Delaware	Georgia	Indiana
Kansas	Louisiana	Minnesota	Montana	Nevada	New Mexico
North Dakota	Oklahoma	Rhode Island	Texas	Washington	Wyoming
Alaska	California	Connecticut	Florida	Idaho	New York
Kentucky	Maryland	Missouri	Nebraska	New Jersey	
Ohio	Pennsylvania	Tennessee	Virginia	Wisconsin	

Green Prison Industries: A survey of and focus groups of NCIA

The survey of members of the National Correctional Industries Association (NCIA) yielded 35 responses representing 19 states. Additionally, two focus groups were conducted with a total of 14 NCIA members at their annual conference. Focus group participants represented states including: Alabama, Indiana, Maryland, Minnesota, Mississippi, Montana, Nevada, North Carolina, North Dakota, Ohio, Pennsylvania, Tennessee, and Virginia. The survey and focus groups sought to uncover information about: current green prison industry work programs; green products, manufacturing processes, and services being created through environmentally sustainable practices; current environmental literacy curricula and training; green skills and competencies acquired through work experiences; future plans for greening prison industry programs; and internal and external institutional barriers to the adoption of green industry programs.

States responding to NCIA Survey:

Arkansas	Colorado	Florida	Indiana	Mississippi
Nevada	Ohio	Rhode Island	Virginia	Wisconsin
Arizona	Connecticut	Hawaii	Maine	North Carolina
New Mexico	Oklahoma	Texas	Washington DC	

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