

# 2011

## Retrofitting the Workforce: Report #5

Educating for Sustainability and  
Greener Supply Chains



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6/30/2011

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# PREFACE

## Intended Audience

This paper is intended for an audience of community college personnel, high school Career and Technical Education (CTE) teachers and administrators, and industry representatives interested in improving sustainability training.

## About the Paper

This paper was funded by the generous support of the Walmart Foundation to the Texas Foundation for Innovative Communities (TFIC). TFIC is a member of the Green Corridor Collaborative, a consortium of seven community colleges and eight workforce boards from San Antonio to Dallas<sup>1</sup>. TFIC, and its primary subcontractor, Good Company Associates, have provided guidance to the Collaborative on green job trends and green industry needs.

This is the fifth report in a series. The first four were on retro-commissioning (or optimizing efficiency in commercial buildings), geothermal energy, smart energy services, and energy storage. They can be found at [www.goodcompanyassociates.com/subj/greenjobs](http://www.goodcompanyassociates.com/subj/greenjobs).

The efforts of the Collaborative have been focused on **modular training**, or training that can be inserted into existing courses and also offered as continuing education for incumbent workers. This modular approach allows for the integration of sustainability into the core curriculum rather than isolating it in elective courses which will be taken by a small percentage of students.

It is our belief that most jobs will have some green element in them and that the lines separating green and non-green jobs will become increasingly blurred. Every worker will need green competencies, much as a vast majority of the workforce needs some information technology skills to successfully perform in their jobs.

**Implementing sustainable solutions is increasingly becoming a foundational competency.** Trends suggest continued growth in the importance of these skills. A vast majority of businesses have sustainability strategies (Bern 2009) and **workers without fluency in sustainable practices will be at a significant disadvantage in the labor marketplace.**

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<sup>1</sup> The Collaborative includes Dallas County Community College District, Texas State Technical College-Waco, McLennan Community College, Temple Junior College, Central Texas College, Austin Community College, Alamo Community College District, and Workforce Solutions (WFS)-Alamo, WFS-Capital Area, WFS- Rural Capital, WFS- Heart of Texas, WFS-Central Texas, WFS-Dallas County, WFS-Tarrant County, and WFS- North Central Texas.

## **Acknowledgements**

My thanks to all those who provided input for the report and/or reviewed various drafts of it, including:

Sally Aiello, Walmart  
Hector Aguilar, Austin Community College  
Ed Ardizoni, Austin Community College  
Michael Berg, Berg & Associates  
Michael Betterworth, Texas State Technical College-Waco  
Rose Blair, Dallas County Community College District  
Mary Brumbach, Dallas County Community College District  
Linda Chavez, Arlington Chamber of Commerce  
Aiden Cohen, City of Austin  
Todd Cohen, consultant for American Association of Community Colleges  
Kellie Duhr, Walmart  
Juline Ferris, State Energy Conservation Office  
Elizabeth Frisch, Culture Technologies  
Anson Green, Alamo Community College District  
Pam Groce, State Energy Conservation Office  
Andrew Hutson, EDF  
Andrew Kim, Austin Community College  
Gina LaMotte, Uplift Austin  
Jenny Lewin  
Dave Meyer, Greenbridge International, Inc.  
Michael Midgley, Austin Community College  
Larry Peterson, Texas Foundation for Innovative Communities  
Glenn Ogden, Lower Colorado River Authority  
Mark Price, Alamo Community College District  
Kate Robertson, EDF  
Dr. Debra Rowe, Oakland Community College  
Don Tracy, Austin Community College  
Conrad Vernon, Greenbridge International, Inc.  
Thomas Vinson Peng, University of Texas at Arlington Zero Waste Network  
Joyce Williams, Dallas County Community College District

# EXECUTIVE SUMMARY

The Green Corridor Collaborative, a consortium of seven community colleges, eight workforce boards, and one non-profit organization, have engaged over 100 subject matter experts to add energy efficiency and renewable energy components to HVAC, construction, electrical technologies, and power management courses. In most of these areas, there are standards and credentials that are widely accepted and used by industry stakeholders. The task for educators is clear: teach to the industry valued standards.

The area of sustainability and green supply chain management is more amorphous and thus, more difficult. There is no widely acknowledged certification for an individual student that would convey expertise and knowledge in this rapidly growing area to industry. Over 90% of businesses are implementing sustainability measures and a large majority plan to continue expanding their sustainability initiatives this year (MIT Sloan Management Review 2011).

There is a need for a broadly accepted, industry valued sustainability credential for individuals. The most cited definition of sustainability comes from the United Nations Environment Program which defines sustainability in 1987 as: “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”<sup>2</sup>

While there is no widely accepted sustainability certification for individuals<sup>3</sup>, many certifications exist for companies, facilities, and products. Colleges should include knowledge of these standards in as many foundational, required courses as possible, as workers across many different industries will need to be familiar with them.

At least initially, the certification colleges should focus on most is ISO 14001, an international standard focused on reduction of energy, water, and materials usage. Colleges should also put a focus on LEED and Energy Star as they are widely accepted and valued by industry. LEED and Energy Star are focused only on building stock however, whereas ISO 14001 has a broader focus.

A majority of Fortune 500 companies have implemented ISO14001 since 1999 and, consequently, numerous training resources are available to support implementation. A new

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<sup>2</sup> More recent definitions of sustainability include the “triple bottom line,” broadening sustainability to specifically include economic, environmental, and social responsibility. This paper does not address social responsibility but rather focuses on the economic case for environmental sustainability.

<sup>3</sup> LEED-AP and LEED-Green Associate are widely accepted certifications for individuals but they are focused on green building specifically and not sustainability generally. See <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=2191> for example, where the US Green Building Council states: “The LEED Green Associate credential is intended for professionals who want to demonstrate green building expertise in non-technical fields of practice.”

and related international energy management standard, ISO 50001, was published in June 2011<sup>4</sup> and is quickly gaining industry traction as businesses look for guidance on reducing their bottom line through energy efficiency. There are many other certifications that organizations should incorporate into sustainability training. These include, but are certainly not limited to<sup>5</sup>:

- Carbon Disclosure Project
- Global Reporting Initiative
- Walmart's Sustainability Index
- UL Environment
- Cradle to Cradle
- Green Seal

There is no reason for instructors to create sustainability curriculum from scratch or in a vacuum. There are many resources available from which to pull existing curricula and/or collaborate with other instructors. The best of these are:

- The Advanced Technology Education and Environment Center which houses a large database of hundreds of syllabi, course materials, activities, and presentations for sustainability educators focusing on the environmental component of sustainability;
- The American Association of Community Colleges (AACC) Sustainable Education and Economic Development Center (SEED) which features a 15-step plan to create a quality green/sustainability program, hundreds of resources vetted by industry and educational experts about curricula, competencies, career pathways and innovative partnership and a curriculum wiki for collaboration;
- The Aspen Institute's Caseplace.org which features hundreds of sustainability case studies from MBA classes, which could easily be adapted for use in community college or high school career and technical education classrooms;
- The Association for the Advancement of Sustainability in Higher Education has a robust resource center and assessment system;
- The Disciplinary Associations Network for Sustainability has curricular resources for a wide variety of academic disciplines; and
- The U.S. Partnership for Education for Sustainable Development has curricular resources for higher education and K-12 and resources on how to build sustainable communities.

There are also some complete curricula available for download to teachers, including *Buy, Use, Toss* which analyzes the sustainability (or lack thereof) of everyday products.

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<sup>4</sup> [http://webstore.ansi.org/iso\\_50001/?source=pr\\_iso\\_50001](http://webstore.ansi.org/iso_50001/?source=pr_iso_50001)

<sup>5</sup> There are literally hundreds of others, these were picked as a sample of some of the most widely used and/or influential certifications.

There is a robust body of literature on sustainability education. From the literature, a few best practices can be gleaned. First of all, wherever possible, real world applications of sustainability should be used for instruction. Instructors could use efforts to green college campuses to teach students about prioritizing projects, calculating return on investment, communicating the need for sustainability, etc. Instructors could also solicit real world problems from local businesses, non-profits, and governmental entities and not only give students industry experience solving real world problems, but also facilitate introductions between hiring managers and college graduates.

Where real world problems cannot be brought into the classroom, real world case studies should be used. The Aspen Institute's CasePlace website provides a wealth of sustainability case studies for analysis.

Colleges can also partner with existing organizations to introduce sustainability into the curriculum. In Texas, to name just a few, Culture Technologies and Second Nature, UpLift Austin, and the University of Texas at Arlington's Zero Waste Network would make excellent partners (see section on "Training Organizations," pages 34-37, for more information on these organizations). Several out-of-state providers, particularly Gatlin Education and Greenbridge International, are either seeking or already have partnerships with Texas colleges.

Sustainability is at its peak in public awareness and in adoption by businesses. But it would be a mistake to think sustainability is a fad. A majority of companies have found cost savings and/or reduced risks through sustainability strategies. Sustainability has moved from an environmental and social concern to a competitive imperative. Companies who do not look to minimize waste are forsaking profit.

**Sustainability has passed a tipping point and is now mainstream, having been adopted by a majority of companies in some form. But while executives and high level managers have bought in to sustainability principles and policies, training for front line workers and middle managers remains insufficient.** There are resources available for instructors but much still needs to be created. There are partners willing to share expertise but the partnerships still need to be formed.

In short, opportunities abound to save energy, water, and materials and increase competitiveness and profits, but the training needs to be in place to allow industry to seize the opportunities.

# INTRODUCTION

## Training for Sustainability

A tremendous amount of sustainability initiatives are underway and an extensive literature exists to document these efforts<sup>6</sup>. Whole books have been written on the topic (for example, Anderson 2009, Cramer 2010 and Werbach 2009), as have scholarly articles (Khiewnavawongsa 2008) and a host of articles in the popular press (Joseph 2010, Walsh 2010, and Woody 2010).

**But little has been written in the U.S. about the *training* needed for sustainability to reach a majority of workers.** The emphasis to date – from a training point of view – has been on sustainability specialists and sustainability officers (i.e., MBA level programs<sup>7</sup>, sustainable engineering programs, etc.). To date, few have focused on training for middle management, much less rank and file workers.

And yet, a massive potential for savings, in financial costs, community health, and carbon emissions, is only realizable if the “boots on the ground” are trained to actively look for opportunities for savings throughout an organization’s supply chain. Consider this from two management professors writing a case study of Subaru’s sustainability initiatives in MIT’s *Sloan Business Review* (Robinson 2009):

### **The front lines have to be engaged.**

Front-line workers are ideally positioned to spot ways to reduce, reuse and recycle -- a discipline commonly referred to as the three R's. Subaru has made the three R's part of worker training, along with a system of thinking known in environmental circles as the "waste hierarchy." This is a ranking of possible environmental actions in increasing order of environmental benefit:

1. To burn material for energy is better than sending it to a landfill.
2. To recycle it is better than burning it.
3. To reuse material is better than recycling it.
4. To reduce the amount needed is better than reusing it.
5. To eliminate the need for material is better than reducing it.

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<sup>6</sup> See Haanaes, Knut, et al. (2010, December 22). [“First Look: The Second Annual Sustainability & Innovation Survey.”](#)

<sup>7</sup> See for instance Aspen Institute’s list of green MBA programs at [www.beyondgreypinstripes.org](http://www.beyondgreypinstripes.org)

One of the biggest challenges and costs in recycling is the sorting of items into the various waste streams for further processing. If this can be done at the source, by the people who first touch it, costs are substantially reduced (or even eliminated). Even more three R's ideas emerge this way. Front-line input is also necessary to ensure that such sorting is smoothly incorporated into the work flow.

Another great example is provided by Interface, a major carpet manufacturer (Kanellos 2011):

A[n] executive from a large customer once visited Interface, the multibillion dollar carpet manufacturer founded by Anderson, with the express purpose of seeing Interface's achievements in sustainable manufacturing in action.

Since 1996, Interface has reduced fossil fuel consumption by 60 percent and total energy use by 44 percent, curbed greenhouse gases by 82 percent, reduced water use by 73 percent, and decreased waste going to landfills by 67 percent. Meanwhile, revenue has grown 66 percent and earnings have zoomed. Since 2003, Interface has made 83 million square yards of carpet with zero environmental impact linked to its production.

"I don't believe this stuff," she said, so Anderson let her loose. Soon, she began to quiz a fork lift driver.

"Ma'am, I come here every day to save the Earth,' the driver said," Anderson recalled. "She about collapsed."

The driver then explained how changes on the factory floor that have reduced company costs and cut fuel consumption. Then he cut the conversation short. The emissions from his forklift were creating waste.

**This engagement of workers throughout an organization is absolutely key to successfully implementing sustainability measures and reaping the rewards from doing so.** Interface, 60% of its way to achieving a zero footprint by 2020, has cut \$400 million of waste through aggressive sustainability actions (Kanellos 2011).

It is one thing for a Chief Sustainability Officer in a corporate headquarters to look for supply chain efficiencies; it is another thing altogether to have a worker on a factory floor or loading dock actively looking for opportunities to reduce packaging and fuel usage.

DuPont's Global Marketing manager for Sustainable Operations, Debra Johnson, wrote about this very problem after attending a green business conference (Johnson 2011):

Dave Stangis, Vice President, CSR/Sustainability at Campbell Soup Company talked about building the foundation for sustainability by developing human capital from day one - preparing the workforce to become sustainably-minded contributors.

Related to top level sustainability commitment, Joel Makower, Chairman and Executive Editor, GreenBiz Group, said, a lot of CEO's are on board. "They are *in*. Now, what they're asking is 'how do I get the rest of my organization *in*?"

If there was a theme at the conference, I would say this was it.

This paper aims to outline a way forward to **develop trainings that can be applied to all workers**, not just sustainability or supply chain specialists, to identify and capture savings through energy and resource efficiency, or what we'll call for the purpose of this paper, "*greening*" *the supply chain*. However, only pieces of what is needed currently exists. The rest will need to be created. As the MIT Sloan Review authors put it: "The front lines have to be engaged."

There are three major sections to the paper.

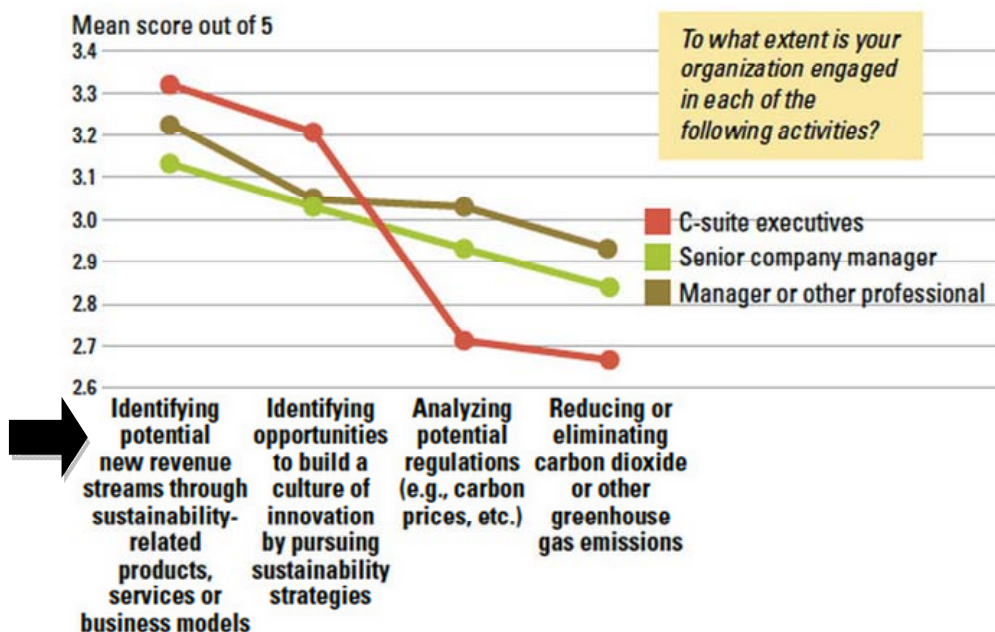
1. The first section highlights key industry standards, credentials, and certifications of which any sustainability educator should be aware.
2. The second highlights free resources for educators.
3. The third section focuses on a few training organizations whose expertise could be leveraged to assist in creating or delivering training.

## The Sustainability Opportunity

The MIT Sloan Management Review and the Boston Consulting Group surveyed 1500 corporate executives in 2009 and 2010. In 2009, **92% of respondents said they implemented at least some sustainability measures within their companies** (Berns 2009). But a large majority want to do more.

**59% said they increased their sustainability efforts in 2010** while only 3% reduced theirs. For 2011, 68% said they planned to increase sustainability initiatives still more (Hanaess 2010).

The reasons are not altruistic. All groups surveyed in the 2010 version, from executives to managers, listed identifying new revenue streams and building a culture of innovation as bigger drivers of sustainability efforts than reducing pollution or meeting regulatory challenges. The gap was most pronounced among executives.



The survey indicates that executives are far more interested in the profitability and innovation that comes from sustainability than in the regulatory or environmental benefits.

But how do you train workers to identify the opportunities for savings? How do you build that culture of innovation around sustainability when the concept is amorphous enough that very few people within a company have a shared definition?

A company would first need to define sustainability in terms of their business goals and corporate values. They are likely to then find a certification which best fit their operational needs; there are many commonly used and widely accepted certifications from which to choose. While there are no widely accepted certifications specifically for sustainability for individuals, there are many for facilities and products, and some for whole companies.

Colleges would be smart to familiarize students with these certifications and align their course objectives with those required for these standards. Colleges can also use the content created for degree seeking students as material for continuing education students, allowing workers – no matter their level of educational attainment – to be trained to identify and capitalize on sustainability opportunities.

# SUSTAINABILITY STANDARDS AND CERTIFICATIONS

There is no universal standard to measure sustainability. This makes training for sustainable thinking and practice very difficult. Clearly, the business world values sustainability, particularly as it presents an opportunity to connect with consumers, reduce waste, and strengthen the bottom line (MIT Sloan Management Review 2011). But which standard should students focus on? Which certificate or credential offers the most value?

There are several standards valued by industry at this point in time, and several others being developed. But the sustainability standards with the highest adoption today are certifications for facilities or companies, not for individuals. This makes aligning curriculum with an industry based certification challenging. The most that a training entity can do is make sure that the students understand core sustainability principles and can implement sustainability standards for facilities and organizations of all types.

In subsequent sections, we recommend activities and best practices (pages 30-33) to teach the skills needed to identify and implement sustainability measures. Teaching these common skills could lead to a skills mastery certificate that will help trainees compete in the labor market.

## ISO 14001: Environmental Management Systems

The International Organization of Standardization (ISO)<sup>8</sup> publishes the ISO 14001 standard for Environmental Management Systems. It is not specific to any sector, industry, or size of company, though it is most commonly used at manufacturing facilities. ISO 14001 stresses reduction in energy, water, and materials usage.

According to ISO, the 14001 standard is designed to ensure that a certified company or organization will:

- identify and control the **environmental impact** of its activities, products or services, and
- **improve** its environmental performance continually, and

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<sup>8</sup> The letters are not in the order they appear they should be because the ISO established their acronym to be universal. Regardless of language, the International Organization of Standards is referred to as “ISO”. [http://www.iso.org/iso/about/discover-iso\\_isos-name.htm](http://www.iso.org/iso/about/discover-iso_isos-name.htm)

- implement a **systematic approach** to setting environmental objectives and targets, to achieving these and to demonstrating that they have been achieved.<sup>9</sup>

As of December 2009, there were over 223,000 ISO 14001 certificates issued in over 150 countries. Over 34,000 of those were added in 2009, a 15% increase<sup>10</sup>. As the spotlight on sustainability and its associated cost savings increase, these numbers are likely to increase as well.

Many large manufacturers require ISO 14001 of their suppliers. As one example, Dell's Supplier Responsibility Statement reads: "We require our suppliers to be compliant with ISO 14001, the most widely recognized standard for environmental management systems, or submit a schedule for achieving certification and obtain Dell approval."

Ironically, ISO – the International Organization for *Standardization* – does not standardize training for implementation of ISO 14001. This creates a challenge and an opportunity for community and technical colleges. Given the large industry demand for this certification, they should familiarize students with this ISO standard.

Colleges typically build courses around end-of-course outcomes, or course objectives. The following objectives could be borrowed or adapted (these are from Durham Technical Community College<sup>11</sup>):

- Understand the specification standard for an environmental management system.
- Recognize appropriate techniques to determine environmental risks and impacts.
- Reduce operating costs in materials, pollution abatement, and waste disposal.

To go even further, a college could adapt these course objectives from the University of Virginia's Darden School of Business's course called "Business and Sustainability:"

- To examine the sustainability challenges and opportunities facing corporations on a global scale
- To show students how major factors supporting sustainability are becoming mainstream global strategic business issues.
- To offer sustainability concepts and frameworks useful to students in their personal and professional decision-making processes

There are many other examples. The Aspen Institute's Beyond Grey Pinstripes database provides a wealth of syllabi on environmental management<sup>12</sup> and other sustainability topics<sup>13</sup>.

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<sup>9</sup> [http://www.iso.org/iso/iso\\_14000\\_essentials](http://www.iso.org/iso/iso_14000_essentials)

<sup>10</sup> <http://www.iso.org/iso/pressrelease.htm?refid=Ref1363>

<sup>11</sup> <http://www.askedu.net/course.asp?CourseNo=34688>

There are also resources available to instructors who wish to teach ISO 14001 and achieve these learning objectives. Some of these resources are highlighted in the “Free Resources” section of this paper (pages 22-29).

The main objective should be clear. A **student should be able to identify and implement an ISO 14001 standard to reduce operating costs in the areas of energy, water, and materials.**

**If they can apply knowledge of ISO 14001 to achieve resource and cost savings, they will be of greater value to an employer or a potential employer than a similarly situated employee or candidate without the training.**

## **ISO 50001: Energy Management Standard**

At the time of publication of this paper, ISO 50001 was only just very recently released, but it is expected to be widely used in large commercial and industrial facilities for managing energy usage and increasing efficiency. The 50001 standard is closely linked to ISO 14001 but focuses exclusively on energy usage whereas 14001 focuses more broadly on energy, water, and materials usage.

ISO 50001 will supply the following elements, all of which could be taught as part of sustainability curriculum (Environmental Protection 2011)<sup>14</sup>:

- A framework for integrating energy efficiency into management practices,
- Making better use of existing energy-consuming assets,
- Benchmarking, measuring, documenting, and reporting energy intensity improvements and their projected impact on reductions in greenhouse gas (GHG) emissions,
- Transparency and communication on the management of energy resources,
- Energy management best practices and good energy management behaviors,
- Evaluating and prioritizing the implementation of new energy-efficient technologies,
- A framework for promoting energy efficiency throughout the supply chain, and
- Energy management improvements in the context of GHG emission reduction projects

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<sup>12</sup> [http://www.beyondgreypinstripes.org/syllabi/Environmental\\_Management.cfm](http://www.beyondgreypinstripes.org/syllabi/Environmental_Management.cfm)

<sup>13</sup> <http://www.beyondgreypinstripes.org/index.cfm>

<sup>14</sup> <http://eponline.com/articles/2011/03/01/iso-energy-management-standard-slated-for-release-in-3rd-quarter.aspx>

With some modification, these elements could form the basis for end-of-course outcomes in a course on sustainable energy management. While ISO 50001 is only just very recently available, the Department of Energy has piloted a program called Superior Energy Performance in Texas, which requires ISO 50001 certification<sup>15</sup>. Dow Chemical is one of the companies piloting this new approach and has documented energy reductions of 6-15%.

While there is no universal standard for sustainability per se, colleges should teach students how to implement both environmental management systems under ISO 14001 and energy management systems under ISO 50001. Both represent systematic approaches to sustainability and are widely respected and used in industry. While both are most commonly used for manufacturing and industrial facilities, their principles can be easily adapted to any company or organization.

There are several other standards that are widely used and students should have familiarity with them. Colleges and students will benefit from incorporating increasing portions of the following standards into coursework when feasible.

## **Carbon Disclosure Project (CDP)**

The CDP's Supply Chain program has 57 global corporate members and is led by Walmart, PepsiCo, and Dell, among others. These corporations aim to reduce carbon emissions throughout their supply chains, achieving considerable sustainability benefits. Over 50% of the average corporate carbon output comes from their supply chain<sup>16</sup>

The implications for workforce training are huge. Even though the CDP Supply Chain Program has only 57 companies they are very large companies and they are increasingly requiring carbon disclosure of all of their suppliers. They are using "sustainability criteria" to "deselect suppliers that do not meet target expectations."<sup>17</sup>

One of their members, AkzoNobel, is a major Texas employer. In the CDP's Annual Report, AkzoNobel stressed the importance of employee engagement on sustainability matters: "We strive to empower all employees to contribute to – and be accountable for – the company's sustainability performance. This responsibility is increasingly anchored in the personal targets and remuneration packages of managers and employees."

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<sup>15</sup> <http://www.superiorenergyperformance.net/ems.html>

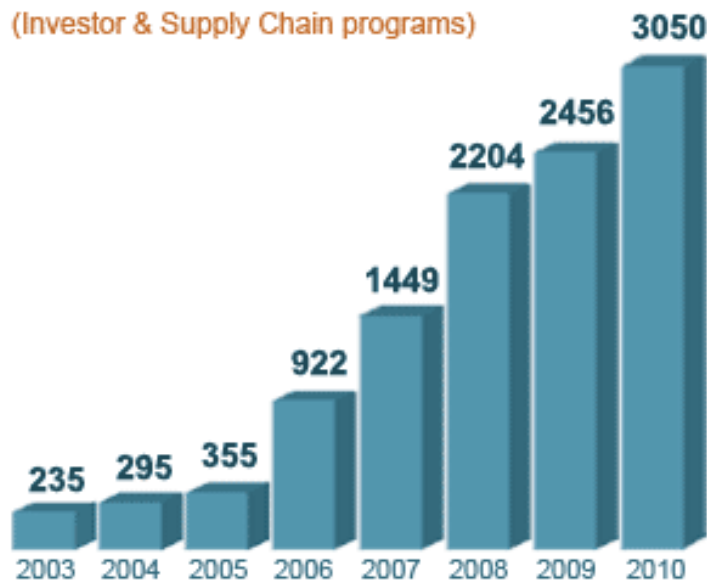
<sup>16</sup> <https://www.cdproject.net/CDPResults/CDP-2011-Supply-Chain-Report.pdf>

<sup>17</sup> *Ibid.*

Again, this employee engagement and accountability is becoming a common refrain. Companies expect their workforce to understand and contribute to the sustainability strategy and are basing compensation, at least in part, on the employee's contribution to sustainability efforts.

CDP's Supply Chain Program, and its related programs for cities' disclosure, etc., are seeing a rapid increase in adoption (see chart below). Therefore, colleges should include, at the very least, an introduction to CDP in any sustainability training program, particularly as it relates to reducing carbon emissions.

Further, CDP makes it easy to design classroom activities for students by posting its reporting guidance for suppliers, cities, etc. on its website<sup>1</sup>. An excellent activity would be to have a group of students create a carbon disclosure report and carbon reduction plan based on CDP's guidance.



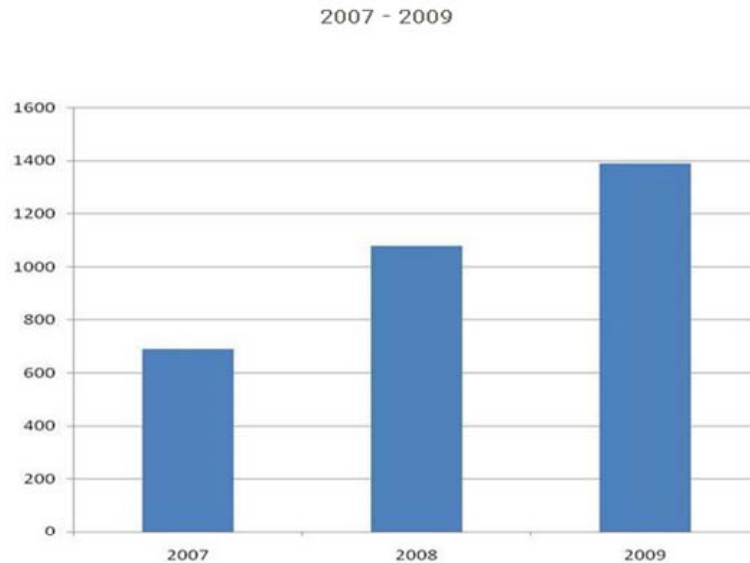
## Global Reporting Initiative (GRI)

The GRI is one of the most widely used standards for measuring corporate social responsibility (CSR). While not strictly a sustainability metric (GRI includes social and

governance issues in addition to environmental ones), it was created by an environmentally minded non-profit (Ceres) and continues to have a strong sustainability component.

GRI's framework is being used by an increasing number of global organizations, going from 50 in its launch year (2000) to 1400 in 2009<sup>18</sup>. Its growth is steady and impressive (see chart below).

### GRI reporting trends



While the 30% growth is impressive, growth in the US has been slow. Only 12% of organizations using GRI are in the US (45% are in Europe)<sup>19</sup>. However, on January 31, 2011, GRI opened an office in Lower Manhattan, hoping to rapidly increase usage of its framework within corporate America for CRS reporting (Kaye 2011, February 2).

While GRI is still nascent in this country, we recommend colleges focus more heavily on the ISO standards. However, as GRI grows in the US, it makes sense to familiarize students with it and maybe even have an activity in which students use the GRI framework.<sup>20</sup>

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<sup>18</sup> <http://www.globalreporting.org/AboutGRI/FactSheet.htm>

<sup>19</sup> *Ibid.*

<sup>20</sup> The GRI guidelines can be found here:

<http://www.globalreporting.org/ReportingFramework/ReportingFrameworkDownloads/>

For an example of a CSR report that follows the GRI framework, see Clorox's CSR:

<http://www.cloroxcsr.com/files/2010-cr-report.pdf>

## **Walmart Sustainability Index and Walmart Employee Sustainability Plans**

Walmart has made a program called My Sustainability Plan available to their workers. It provides a systematic way for employees to track their own personal sustainability measures. Through MSP, Walmart employees can save money while helping the environment and learn to spot sustainability opportunities at work as well.



Students could also develop and implement MSP's as a real world case study, report on their personal progress, calculate costs and savings associated with sustainability, and prioritize projects. This presents an excellent activity for teaching sustainability principles and actions.

Walmart is also developing a Sustainability Index for products sold in Walmart stores. Walmart announced the initiative in 2009 to quantify the sustainability of the products it sells and of its supply chain partners. Given the enormity of the company, this effort will have a major impact on anyone involved with sustainability training.

However, to date, the Sustainability Index is still under development by a team consisting primarily of researchers at the Universities of Arizona and Arkansas, with substantial input from corporate partners who pay \$50,000 each to members of the Sustainability Consortium.

The Index is expected to be made public sometime in the next year.

## **UL Environment**

In 2010, Underwriters' Laboratory announced they would develop standards for sustainability. Given UL's reputation internationally for safety standards, this announcement gained a lot of attention. Just as UL has brought rigor and third party, trusted validation to safety standards, they are aiming to do the same for sustainability.

So far, they have focused on standards for cell phones, computers, and a company level sustainability standard<sup>21</sup>. While UL Environment is one of the newest entrants to the sustainability certification space, they will clearly be an important participant in the marketplace of standards and any course on green supply chain management or sustainability should be prepared to cover its tenets. Their acquisition of TerraChoice, the manager of Canada's leading third party sustainability standard program, in August 2010, substantially increased their credentials in the space<sup>22</sup>.

Free short courses and other information about UL Environment can be found on the website of UL University<sup>23</sup>.

## **Cradle to Cradle**

Cradle to Cradle is one of the most comprehensive standards for sustainability in existence. Founded by William McDonough of the University of Virginia, C2C provides a certification for products that use sustainable materials and production processes, and include a plan for completely recycling the embedded materials after the useful life of the product has ended.

Workers trained to think about sustainability in this comprehensive way will have an advantage seeking employment with companies who employ this standard. They include Nike, Owens Corning, PepsiCo, Nestle, Ford, and a growing list of other large companies. The complete list can be found on the Cradle to Cradle website.<sup>24</sup>

## **Green Seal**

Green Seal is one of the oldest and most widely used green certifications. It is a non-profit which develops product standards in a wide variety of areas and then certifies products, facilities, or companies that meet those standards. Its standards cover 90 product categories. Over 300 individual products have been certified.

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<sup>21</sup> <http://www.greenbiz.com/blog/2011/02/10/metrics-and-standards-become-rule?page=full>

<sup>22</sup> <http://www.greenbiz.com/news/2010/08/31/ul-acquire-terrachoice-green-standard-consolidation>

<sup>23</sup> <http://www.uluniversity.us/Catalog/Browse.Catalog.aspx?Tab=1000000&Index=UL%20Environment>

<sup>24</sup> <http://www.mbdc.com/clientlist.aspx?linkid=4&sublink=14>



While, there are no studies completed that have proven its efficacy, Green Seal is widely regarded as one of the top product certifications available. It had certified over 50 appliances before Energy Star came into existence.<sup>25</sup> Green Seal also recently announced the formation of a company certification.<sup>26</sup>

Later this year, the Federal Trade Commission will issue guidelines for companies or certifiers that make green claims<sup>27</sup>. Many of the 377 eco-label certifications<sup>28</sup> currently used will not last and a consolidation will take place. UL Environment, Green Seal, and Cradle to Cradle, among others, are the most likely to remain relevant and grow following the FTC guidance.

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<sup>25</sup> Ibid.

<sup>26</sup> <http://www.greenbiz.com/news/2010/09/13/green-seal-unveils-pilot-certification-sustainable-companies>

<sup>27</sup> <http://yourlife.usatoday.com/your-look/story/2011/04/FTC-to-issue-new-green-guidelines-address-tsunami-of-marketing-claims/46329674/1>

<sup>28</sup> <http://www.ecolabelindex.com/> as of May 9, 2011

# FREE RESOURCES FOR EDUCATORS

This report is intended for a community college audience, and high school Career and Technical Education (CTE) teachers and administrators. Some of the resources in this section are not specifically created for high schools and colleges but contain materials that could be adapted for their use. Other materials are designed for secondary and post secondary settings.

## CasePlace

A project of the Aspen Institute’s Center for Business Education, this website contains several hundred case studies and instructional materials related to sustainability. The site is intended for MBA instructors, but many of the resources at the site could easily be adapted for use at the college level.



The image above is a screenshot from [CasePlace.org](http://CasePlace.org).

Here are a few examples of cases that could be useful to community colleges related to greening the supply chain (these are all quotes taken from longer descriptions at [caseplace.org](http://caseplace.org)):

### Genzyme Center (A, B, C):

Genzyme Corporation is in the midst of planning its new corporate headquarters, which incorporates many innovative green building features. After learning that the building as planned would likely earn a LEED Silver rating, an intermediate score in the LEED green building rating scheme, the CEO charged

the building team with exploring opportunities that would enable the building to earn the highest rating, LEED Platinum. Five additional green building features are described, and students are asked to analyze and recommend which, if any, of these features to pursue based on their cost, likelihood of earning LEED credits, and their influence on the building's environmental performance.

[http://cb.hbsp.harvard.edu/cb/web/product\\_detail.seam?R=610008-PDF-ENG](http://cb.hbsp.harvard.edu/cb/web/product_detail.seam?R=610008-PDF-ENG)

### **Cradle-to-Cradle Design at Herman Miller: Moving Toward Environmental Sustainability:**

The case describes the C2C protocol, the details of how Herman Miller implemented C2C during the design of the Mirra chair, as well as the impact of the new protocol on their internal processes: design decisions, manufacturing, and supply chain management. The proximate decision point in the case is whether the company should replace the polyvinyl chloride (PVC) material in the arm pads of the Mirra chair. PVC was a highly toxic material to manufacture and dispose of and thus violated the C2C protocol. However, it was the standard material for arm pads and many other parts in the office furniture industry as it was durable, scratch resistant, and inexpensive. To switch to thermoplastic urethane (TPU), a more environmentally friendly material, for the Mirra Chair arm pad required at least modification of a production tool, or possibly a completely new tool. In addition, the cost of TPU was higher than PVC. There was also uncertainty about how consistent the quality of the arm pad would be with TPU.

<http://cb.hbsp.harvard.edu/cb/product/607003-PDF-ENG>

### **Sustainable Supply Chains:**

In June 2003 a Global Compact Policy Dialogue gathered more than 200 representatives from business, civil society, academia and UN agencies at UN headquarters to identify problems and solutions related to supply chain management and partnerships. A final report on the outcomes of the dialogue – entitled “Supply Chain Management” – has been published on the Global Compact website [www.unglobalcompact.org](http://www.unglobalcompact.org). Following this policy dialogue, some Global Compact participants were invited to develop case studies describing their experiences with supply chain management, focusing especially on their relationships with small and medium-sized companies. These case studies were discussed during the International Learning Forum Meeting in

Brazil (2003) and have been published on the Global Compact website. We hope that printing the studies will enable further distribution and help managers around the world to establish or improve their sustainable business linkages.

[http://www.unido.org/fileadmin/user\\_media/Publications/Pub\\_free/Sustainable\\_supply\\_chains.pdf](http://www.unido.org/fileadmin/user_media/Publications/Pub_free/Sustainable_supply_chains.pdf)

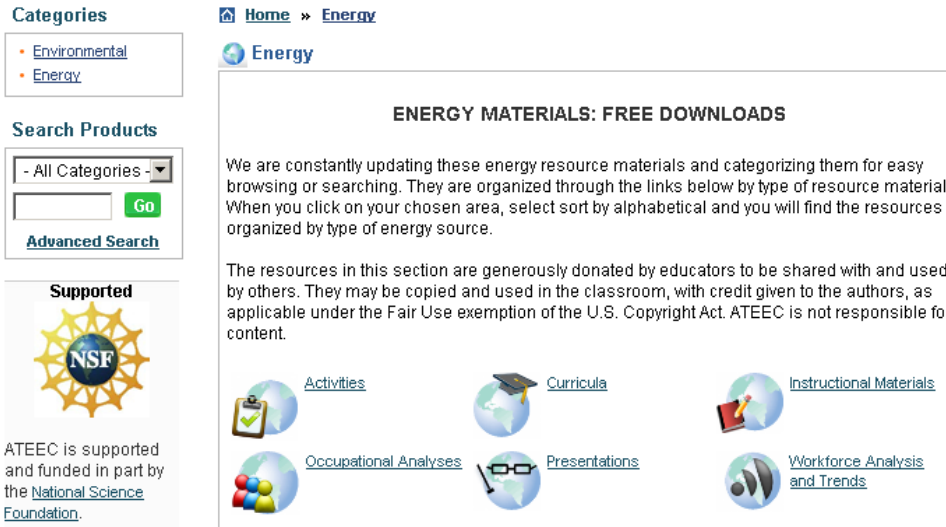
### **Wal-Mart's Sustainability Strategy:**

The sustainability strategy needed to keep environmental improvement tightly coupled with business value and profitability for the strategy to succeed. Describes Wal-Mart's efforts to accomplish this, focusing on three of the company's primary focus areas (seafood, electronics, and textiles) and their effect on the company's operations, supplier relationships, and results. Also explores how Wal-Mart is measuring and communicating its ideas about sustainability to its suppliers, associates, customers, and the public.

[http://cb.hbsp.harvard.edu/cb/web/product\\_detail.seam?R=OIT71-PDF-ENG](http://cb.hbsp.harvard.edu/cb/web/product_detail.seam?R=OIT71-PDF-ENG)

### **Advanced Technology Environmental and Energy Center (ATEEC) database**

There are a lot of resources for sustainability education available but no generally agreed upon clearinghouse for easy, consistent access. The National Science Foundation funded the Advanced Technology Environmental and Energy Center to create a database of free downloads. As of February 1, 2011, there are literally hundreds of activities, instructional materials, syllabi, and more available at the site. The materials cover a broad range of topics related to energy and environment and contain valuable content for instructors who wish to include environmental sustainability activities in their courses.



The image above is a screenshot from the ATEEC database website.

While there is a lot in the database related to sustainability there is nothing specifically on ISO 14001 or green supply chain management. These could be fruitful areas for future development.

One presentation, complete with checklists and questions for students, is entitled “Toward a Sustainable Campus.”<sup>29</sup> Produced by Eastern Iowa Community College, this presentation could form the basis of a curriculum module to teach students to look for sustainability opportunities.

## **EPA Integrated Environmental Management Systems Implementation Guide**

There are a variety of guides to implementing environmental management systems, any of which could be used to provide sustainability practice to students. There are guides for local governments<sup>30</sup>, water utilities,<sup>31</sup> and other public entities<sup>32</sup>. But one of the best is called the EPA Integrated Environmental Management Systems Implementation Guide<sup>33</sup>.

It was produced in 1999-2000, and so, is a bit dated. However, it provides some excellent exercises and worksheets on implementing ISO 14001. It is intended for a private company that

<sup>29</sup> <http://www.ateec.org/store/catalog/Education---Towards-a-Sustainable-Campus-234.html>

<sup>30</sup> <http://www.culturetechnologies.com/LG%20EMS%20Resources/EMSGuideforLG.pdf>

<sup>31</sup> <http://www.culturetechnologies.com/LG%20EMS%20Resources/O73F4246.pdf>

<sup>32</sup> <http://www.culturetechnologies.com/LG%20EMS%20Resources/O73F6926.pdf>

<sup>33</sup> Available in English and Spanish: [http://www.epa.gov/dfe/pubs/iems/iems\\_guide/index.htm](http://www.epa.gov/dfe/pubs/iems/iems_guide/index.htm)

wants to implement an ISO 14001 compliant environmental management system, which covers reduction of energy, water, and materials usage.

The EPA Guide could be used as a teaching tool, particularly if it was applied to the college itself. In other words students could use the Guide to assess energy, water, and materials usage for the college campus at which they are located.

The Guide consists of nine modules, all very robust and usable with very little adaptation:

#### **MODULE 1: LAYING THE GROUNDWORK**

- Figure 1-a. The Continuous Improvement Cycle
- Figure 1-b. Functions to Include in Your IEMS Team
- Figure 1-c. Examples of Environmental Aspects and Associated Impacts
- Figure 1-d. How an Activity Becomes an Impact
- Figure 1-e. Generic Process Map for Business Activities
- Figure 1-f. Product X – Extended Responsibility
- Figure 1-g. Input-Output Diagram for a Step in a Manufacturing Operation
- Figure 1-h. Input-Output Diagram for a Copier
- Figure 1-i. Input-Output Diagram for Cleaning a Printing Press
- Figure 1-j. Inputs and Outputs of a Company's Products and Services

#### **MODULE 2: CREATING AN ENVIRONMENTAL POLICY**

#### **MODULE 3: DETERMINING SIGNIFICANT ENVIRONMENTAL ASPECTS AND SETTING OBJECTIVES page 35**

- Figure 3-a: Ranking Symbols
- Figure 3-b: Information on an MSDS
- Figure 3-c: Screen Printing Exposure Pathways
- Figure 3-d: Dry Cleaning Exposure Pathways

#### **MODULE 4: EVALUATING ALTERNATIVES**

#### **MODULE 5: SETTING TARGETS AND MEASURING SUCCESS**

- Figure 5-a. Root Cause Diagram

#### **MODULE 6: DEVELOPING OPERATIONAL CONTROLS page 94**

#### **MODULE 7: IMPLEMENTING YOUR IEMS page 106**

- Figure 7-a. Sample Environmental Management Project Plan
- Figure 7-b. Sample Environmental Management Project Plan

#### **MODULE 8: BUILDING ORGANIZATIONAL SUPPORT page 113**

- Figure 8-a. Documentation Levels page
- Figure 8-b. Levels of stakeholder interest

#### **MODULE 9: ESTABLISHING CONTINUING IMPROVEMENT**

The EPA Implementation Guide also includes sample questions to ask suppliers and worksheets to evaluate costs and performance of sustainability measures.

This guide, or any of the others reference above could be very useful teaching tools for introducing the creation of sustainability plans.

### **American Association of Community College (AACCC's) SEED Center**

The Sustainability Education and Economic Development (SEEC) Center, a project of the AACCC, is a new effort to catalog the many sustainable training resources available, specifically ones aimed at colleges.

The SEED Center features a 15-step process for how to build a quality sustainable education program<sup>34</sup>. Many colleges will have completed several of the steps already, but most will also have significant gaps. This new tool will allow for easier identification of those gaps and a roadmap for teachers and students who want to learn sustainability by implementing sustainability strategies on campus.

On the next page are the steps from the SEED Center website:

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<sup>34</sup> <http://www.theseedcenter.org/Resources/How-to-Build-a-Quality-Green-Program>

## First Steps

1. Form a Sustainability or Green Committee.
2. Assess your existing academic programs, practices, and policies on sustainability and green education.
3. Create signage and a communication plan to educate students and the public.

## Core Strategies – Establishing Program Fundamentals

4. Create effective and inclusive community and industry partnerships to build a more sustainable economy.
5. Incorporate green principles into existing technical programs.
6. Utilize the resources of the SEED center to learn about promising curricula, job predictions, competencies and certifications, and more.
7. Encourage use of the SEED and other online learning communities by your faculty and staff.
8. Develop new technical programs based on regional industry demand.

## Core Strategies – Strengthen Program Depth, Reach, and Effectiveness

9. Integrate green and sustainability principles across academic disciplines--not just technology programs.
10. Reach out and educate contractors and other business owners to build a green economy.
11. Create staff and faculty development opportunities in green and sustainability education.

## Leadership Strategies

12. Include sustainability thinking and actions as an expectation in all institutional job descriptions and annual reviews.
13. Be aware of changes that will dramatically affect the marketplace and take action to overcome barriers to energy efficiency and clean energy production.
14. Educate the public.
15. Use the campus and the community as a living lab for sustainability to engage both students and the public in sustainable solutions.

The SEED Center also includes a curriculum wiki<sup>35</sup> available to all community college staff. As of the date of publication, there are only a few entries into the wiki but it is certainly worth monitoring for valuable teaching resources in the future.

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<sup>35</sup> <http://www.theseedcenter.org/Sharing-Community/Submit-Your-Curricular-Materials-Wiki>

The AACC has made a significant commitment to focus on increasing sustainability at community colleges and improving sustainability education. They could be both a significant resource for materials and mentoring, and an important partner for college sustainability projects going forward.

## **Buy, Use, Toss**

Buy, Use, Toss is an instructional tool marketed to high school educators but includes many curriculum modules and activities that can be utilized by college instructors as well. It is a two-week curriculum, with ten fully developed lessons, designed to engage students to think about the life cycle of products.

The curriculum was developed by Facing the Future and can be found on their website<sup>36</sup>. According to their website: “Students will learn about the five major steps of the materials economy; Extraction, Production, Distribution, Consumption, and Disposal. They will also be asked to analyze the sustainability of these steps, determining how consumption can benefit people, economies, and environments.”

One lesson in particular (Lesson 9) is relevant for teaching and learning greening the supply chain; here is the description for lesson 9:

Students recall the hidden impacts associated with various components of the materials economy (the system of producing and consuming goods). They then brainstorm points of intervention in order to redesign the system. Students work in pairs to determine ways to make the materials economy more sustainable.

This kind of exercise could be inserted into existing courses to engage students in the kinds of critical thinking needed to effectively deal with supply chain sustainability issues.

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<sup>36</sup> <http://www.facingthefuture.org/Curriculum/BuyUseToss/tabid/469/Default.aspx>

## **Association for the Advancement of Sustainability in Higher Education (AASHE)**

AASHE provides a resource center full of curriculum resources<sup>37</sup>, including case studies, syllabi, course inventories, student research papers, and more. Many of these resources are available only to AASHE members.

AASHE also provides the Sustainability Tracking and Rating System which focuses on the triple bottom line of sustainability (environmental, economic, and social) and how to implement it in all parts of the campus. They include curricular activities.

Another organization, the Disciplinary Associations Network for Sustainability (DANS), lists more comprehensive learning outcomes for sustainability. DANS is also working with the American Association of Colleges & Universities and eleven academic disciplinary associations to integrate sustainability education into the STEM disciplines (science, technology, engineering and math as well as other disciplines) in introductory undergraduate courses.

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<sup>37</sup> <http://www.aashe.org/resources/curriculum-resources>

# BEST PRACTICES IN WORKFORCE TRAINING FOR SUSTAINABILITY

## Best practice #1: Use real world case studies.

Greenbridge International is a leading provider of training for certification in ISO 14001, the international standard for environmental systems management. Greenbridge trains using a pedagogical method called action learning; the training and the doing are one and the same. They train 30-40 upper and middle managers over four days. The training consists of creating an environmental management plan for their organization that meets ISO 14001 requirements. They go through exercises to think about how to reduce energy and water used by their business.<sup>38</sup> It's as real world as it gets.

Every training organization seeking to teach sustainability should engage students in actually making a real world organization in which they are involved more sustainable. There is no reason any training should be merely theoretical. There is too much work to be done.

Greenbridge follows up the four day planning sessions with upper and middle management, with a four hour course for everyone in the company. This is clearly a best practice as well. If you're going to teach upper management how to be sustainable and leave out the workers who will actually have to implement the sustainability vision, there is very little chance sustainability will really take hold.

Greenbridge is not the only training provider using this method. Harvard Business School is another proponent. In its course description for a class entitled "Strategies for Sustainable Management," the syllabus states:

Most sustainability courses are taught from a global perspective or as a corporate sustainability strategy course. This course focuses on local facilities at the nexus with local government and the residents of the community.

The case method is utilized to provide a participative and realistic forum that enables students to both learn about sustainability while developing the skills to use the information.<sup>39</sup>

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<sup>38</sup> <http://www.greenbridgeinternational.net/getmethod.html>

<sup>39</sup> [http://isites.harvard.edu/fs/docs/icb.topic859361.files/SyllabusE105\\_2011.pdf](http://isites.harvard.edu/fs/docs/icb.topic859361.files/SyllabusE105_2011.pdf)

Creating an environmental management plan is the best practice, but that is not always possible. Greenbridge works with clients who need not only the training but also the development of the plan; they get both. For example, students at a community college may not be able to develop a plan that will actually be implemented, but every effort should be made so that implementation is at least a possibility.

The case method used by Harvard should be the minimum. Study the case of a particular entity, its goals, its challenges, its potential solutions. But if the particular entity is real – for example, the college itself – the students will see the relevance of the exercise far more clearly. And the lessons learned will benefit the students and potentially the college itself.

### **Best practice #2: Do the math on the business case for sustainability. Emphasize metrics.**

The old maxim from Peter Drucker holds true: What gets measured, gets done. If students are unable to quantify the effects and cost benefits of sustainability, they are unlikely to be able to implement sustainability measures in the workplace. If students are unable to measure and verify savings after implementation, the sustainability measures likely will not remain in effect.

For this best practice, the [caseplace.org](http://caseplace.org) database is a great resource. It is full of cases with real world math on costs and tangible benefits of sustainable actions (reduced energy, water, and materials costs). It also includes some cases where the costs far outweighed the benefits but a business decided to go ahead with the sustainability measure anyway (see best practice #3). Studying these examples provides insights into why certain sustainability initiatives might be attractive to businesses even if they don't directly strengthen the bottom line.

The most important reason to do the math on sustainability initiatives is that doing so helps to ensure that the initiatives are themselves sustained. That is, if an employee can show that there are savings produced from a particular practice, and that eliminating that practice will cause costs to increase (and thus profits to go down), it is much more likely that practice will remain in effect. There are also Community Sustainability Indicators available if the students are working on community instead of business level projects.

### **Best practice #3: Use some case studies where the cost-benefit analysis showed sustainability didn't work.**

To teach sustainability honestly, it is important to include some case studies where the return on investment was not good enough to merit action on a particular sustainability initiative. Let's face it, not all sustainable actions are created equally. Some have extremely short pay back periods (HVAC tune-ups, lighting retrofits) and others have much longer returns (swapping out relatively new equipment, some solar energy applications, etc.).

Students absolutely should study and work to implement sustainability measures that make good economic sense. But they should also learn to spot the measures that don't and differentiate between them. To bring all sustainability measures to a future employer's attention, without filtering or prioritizing based on affordability and profitability, will cause the employee to lose credibility.

Some businesses may still want to move forward with some sustainability measures that don't have a quick return on investment. Sometimes a bundling of sustainability projects with joint ROI on a number of projects is still acceptable to the company. This approach prevents short term thinking on merely the best ROI. Short term thinking can prevent a deeper implementation of sustainability.

It is important to teach students to not just cream off the best ROI projects but to create an extensive sustainability plan that gets at more sustainability actions at a still acceptable ROI by bundling them together.

### **Best practice #4: Include thought skills, including basic psychology, so that students understand how to motivate people to be sustainable, from upper management to rank-and-file workers.**

Community colleges have a unique role to play here. They are most likely (though certainly not always) training workers below executive level but well above minimum wage. To implement sustainability strategies they will need to communicate the value proposition to upper management and figure out how to motivate those below them to take action. Both tasks are very difficult.

To influence executives, many of the other best practices are relevant. Students need to show the bottom line impact of sustainability initiatives. This will involve weighing complex factors and doing the math to show return on investment. But even the most painless measures, with the quickest paybacks, will still meet with resistance. Successful sustainability education

programs will have to equip students with the means to wear down or transform this resistance into positive action, whenever possible.

Students need to be able to elevate the actions with the quickest payback or best sustainability outcomes (depending on the company's policies and criteria) and help figure out how to pay any upfront cost associated with sustainability measures. It is important to remember that ROI is not always what motivates management. It can also be reputation or personal commitment or market positioning issues that convince management, so students should be familiar with all the benefits that can help organizations and individuals commit to sustainability actions.

There may inevitably be resistance from some workers on the lowest rungs of the socioeconomic ladder as well as with upper management. To the rank-and-file employee, who may not receive profitability bonuses or stock options, the overall profitability of the company will likely not be a motivating factor. Other methods will need to be employed. Students could learn – and even practice at the colleges – setting up contests with small prizes for people within the organization who save the most resources and money. Students could learn how to educate colleagues on the environmental impact of their actions, and their ability to produce positive results if they are willing to change.

# SUSTAINABILITY TRAINING ORGANIZATIONS

As Texas community colleges try to implement sustainability training into their curriculum, they should consider partnering with existing entities that have experience in the field. There are several excellent groups in Texas, a few of whom are highlighted in the report. This is in no way meant to be a comprehensive list, but rather a sampling of some of the groups providing sustainability training in Texas and beyond.

## Culture Technologies <sup>40</sup>

Culture Technologies and an associated non-profit, Nurtured World, provided ISO 14001 training to local governments for three years under a contract from the Texas Commission on Environmental Quality. They trained municipal employees how to implement strategies to increase efficiency and reduce waste and had a very successful track record.

They continue to work with private industry to implement environmental management systems and increase sustainability. Given their background in training, they could be an excellent partner for community colleges in Texas.

## University of Texas at Arlington Zero Waste Network

The Zero Waste Network hosts trainings in multiple Texas cities each year to help businesses reduce waste in energy, water, and materials<sup>41</sup>. They are one of the pre-eminent trainers in sustainability in Texas and have been conducting sustainability trainings for eight years.

In fall of 2011, they will have courses in the DFW Metroplex and in Houston; other courses could be added if there is demand. UTA is willing and interested in working with community colleges to develop sustainability training customized to colleges' needs.

Here is a description of the trainings UTA's Zero Waste Network offers:

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<sup>40</sup> <http://www.culturetechnologies.com/training.html>

<sup>41</sup> <http://www.zerowastenetwork.org/workshops/index.cfm>

Our workshops will give you strategies on how to improve efficiency while decreasing or eliminating pollution. Experts in pollution prevention, environmental management systems (EMS), environmental regulations, and energy efficiency conduct an interactive workshop with classroom exercises that will help you use P2 [pollution prevention] strategies to improve your bottom line.

In previous years, workshop participants reported savings of over \$200,000 by implementing pollution prevention practices; they eliminated over 11,000 pounds of pollution, and reported improvement in compliance, energy use, and water conservation.

They also conduct “free monthly webinars for applying the latest tools and techniques for protecting the environment by increasing process efficiency. The monthly webinars often include speakers from industry, government, university and consulting groups with practical tips and techniques.” Instructors from community colleges would be welcome to join.

There is considerable expertise at UTA and one of their partners, the Texas Manufacturing Assistance Center (TMAC), that could be leveraged by community colleges to effectively train students and incumbent workers in sustainability theory and methods.

## **Greenbridge**

Greenbridge was referenced in a best practices section (p. 30) for their action learning method. Greenbridge has conducted action-oriented sustainability trainings all over the US, including in Texas, though they are actively looking for community college partners in order to serve many more companies interested in ISO 14001. Several companies have expressed interest in teaming with Greenbridge on Skills Development Fund proposals but these proposals have not been submitted due to lack of willingness to partner by community colleges.

For colleges willing to allow Greenbridge to deliver professional education for incumbent workers (Continuing Education, or not-for-credit), Greenbridge will help those colleges build capacity to teach sustainability to for-credit students. Some colleges will consider Greenbridge a competitor in the CE realm; others will have no interest in competing with them for CE students. For the latter, a partnership with Greenbridge could make a lot of sense as an initial step into sustainability training.

## **UpLift Austin**

UpLift Austin is a non-profit which has created four courses currently being taught in Austin-area high schools, including the KIPP Academy, Garza High School, and Akins High School. Their courses include an Introduction to Sustainability course which is taught as a core science course, rather than as an elective. This is a key feature of UpLift's program. It allows a real focus on sustainability by all students, as opposed to a quick overview by a few.

Colleges should work to align their sustainability initiatives and teaching with high school science and technical courses whenever possible. UpLift Austin offers one of the few sustainability curricula which is actually in use in Texas schools.

## **Gatlin**

One of the members of the Green Corridor Collaborative, Austin Community College offers a Continuing Education (non-credit) Sustainability Professional Certification through a third party (Gatlin Education). The course outline<sup>42</sup> could be useful for developing course modules to be included in for-credit courses.

### **I. Green Purchasing Fundamentals**

- A. Introduction to Green Procurement
- B. Design for Environment (DfE) Principles
- C. International Green Labeling
- D. Green Product Standards
- E. Environmentally Preferred Purchasing (EPP)
- F. Supplier Relationship Management
- G. Green Purchasing Program Development

### **II. Sustainability 101: Corporate Social Responsibility**

- A. Sustainable Development
- B. The Business Case for Sustainability
- C. Organizational Roles and Functional Influences
- D. Corporate Social Responsibility
- E. Sustainability in Major Business Sectors
- F. The U.S. Green Building Council and LEED
- G. Introduction to Environmental Science

### **III. Carbon Strategies**

- A. Introduction to the World Resources Institute (WRI) Protocol
- B. Developing a Climate Strategy

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<sup>42</sup> [http://www.gatlineducation.com/unbranded/sustainability\\_professional.html](http://www.gatlineducation.com/unbranded/sustainability_professional.html)

- C. Supporting Green House Gas Reductions
- D. Tracking Emissions and Reporting
- E. Tools and Best Practices Every Organization Should Know About
- F. The Green Supply Chain's Carbon Footprint
- G. Developing a Carbon Policy

**IV. Environmental Management Systems: EMS (ISO 14001)**

- A. Introduction to the ISO 14000 Series
- B. The ISO 14001 Standard
- C. Strategic Environmental Management
- D. Corporate Environmental Management: Eco-Control Systems
- E. Environmental Management in Developing Countries

**V. Environmental Accounting 101**

- A. Emerging Requirements
- B. Environmental Accounting Framework
- C. Environmental Management Accounting
- D. Environmental Financial Accounting
- E. Ecological Accounting
- F. Eco-Efficiency Information Management

**VI. Green Marketing and Sales Force Essentials**

- A. Corporate Environmentalism
- B. Greening the Marketing Mix
- C. Green by Design
- D. Communicating Green With Impact
- E. Eco-Innovation: Rethinking Future Products
- F. Case Studies

**VII. Green Transportation: 12 Best Practices**

- A. Green Transportation and Logistics
- B. Building Energy Efficiency in 3PL Operations
- C. Greater Sustainability in Distribution Operations
- D. The EPA SmartWay Program
- E. Green Fleet Management
- F. Best Practice Case Studies

**VIII. Sustainability Leader: First 180 Days to Success**

- A. Defining the Performance Requirements
- B. Prioritizing Transition Initiatives
- C. Developing Key Internal Relationships
- D. Managing the Green Organizational Change
- E. Mapping Staff Capabilities

**IX. Advanced Green Purchasing**

- A. Philosophy of Sustainable Design
- B. The Elements of Green Design Methodology
- C. The Technologies and Components of Sustainable Design

- D. Design for Environment Engineering
- E. Alternate Material Strategies

#### **X. The Sustainability Consultant**

- A. Green Consulting 101
- B. Conducting the Sustainable Needs Assessment
- C. Solving Client Problems: Guide to Troubleshooting
- D. Increasing Client Effectiveness
- E. Performance Improvement Strategies

## **CONCLUSION**

Sustainability – defined as waste reduction – is not a fad. It is an effective approach to minimizing the use of increasingly expensive natural resources. Reducing non-valued added activities in a process or service effectively yields a competitive advantage for an organization and can reduce costs and help maintain market-share in price sensitive industries. Done right, sustainability increases profits and reduces risks.

As long as there is capitalism, there will be an inexorable drive to reduce usage of finite resources and to reduce risks. When everyone does it, leading companies will innovate further to yield additional competitive advantage. Shareholders demand returns, and increasingly, customers demand sustainable products that are safe, effective, and cost-competitive.

But for sustainability to be effective and profitable, training opportunities must be significantly improved and the scale must be much larger. Too few workers are trained in sustainability outside of ad hoc, on-the-job trainings which may or may not be successful. Sustainability has gone mainstream, but training for sustainability lags.

This can be remedied. While leading companies in sustainability continue to develop the standards and certifications to measure and certify the sustainable content of products, or the sustainability of facilities, community and technical colleges need not wait. Much as sustainability is a process of continuous improvement, so will the standards and certification. A lack of industry consensus should not be an excuse to stand still.

Besides, a widely accepted industry standard exists, in the form of ISO 14001. While it is mainly used by manufacturing facilities, its principles and processes can easily be adapted to many other settings, including to community colleges themselves. For the best training possible, and for the opportunity to lower energy and water bills on campus, colleges should employ action learning for students across many disciplines.

In short, colleges should actively work to implement sustainability on campus and in their communities. They should challenge students to both identify sustainable measures and prove that the economics work. This challenge should be included as part of coursework across the curriculum. Sustainability should not be buried in an electives course. It is too important to industry – so important that identifying and implementing sustainability measures should be treated as a foundational competency.

Community colleges should make sure that sustainability experts are part of their industry advisory councils and that their campus sustainability teams actively seek engagement from industry to ensure that content is in line with real industry practices and values.

And finally, community colleges should heavily leverage the increasingly dense repositories of sustainability curriculum materials found on sites like ATEEC.org, caseplace.org, AASHE, and the AACC's SEED Center. These sites are invaluable to ensure that duplication is avoided and that colleges are constantly pushing the envelope as they create sustainability curriculum. There is too much to be done to move laterally.

The sustainability challenge is a major one, but the opportunity is bigger. As businesses seek to strengthen their companies with sustainability measures, community and technical colleges need to provide them the workers to ensure their success.

# BIBLIOGRAPHY

Afterian Change, Susan (2010). "The Sustainability Education Gap." The Finance Professionals' Post. <http://post.nyssa.org/nyssa-news/2010/04/sustainability-education-gap.html>

Anderson, Ray (2009). *Confessions of a Radical Industrialist: Profits, People, Purpose--Doing Business by Respecting the Earth*. St. Martin's Press.

Arimura, Toshi (2009). Is ISO 14001 a Gateway to More Advanced Voluntary Action: A Case for Green Supply Chain Management. Resources for the Future. Washington DC.  
<http://www.rff.org/documents/rff-dp-09-05.pdf>

Aspen Institute (2008). "A Closer Look at Business Education: Supply Chain Management."

Aston, Adam (2011, January 31). "Inside GRI's Efforts to Boost CSR Reporting in the States." *Greenbiz.com*. <https://www.greenbiz.com/blog/2011/01/31/inside-gri-efforts-boost-csr-reporting-states>

Berns, Maurice, et al. (2009). "The Business of Sustainability." MIT Sloan Management Review.

Brighter Planet (February 2010). *Employee Engagement Survey: An Analysis of the Extent and Nature of Employee Sustainability Program*.  
[http://attachments.brighterplanet.com/press\\_items/local\\_copies/55/original/employee\\_engagement\\_2009.pdf?1265816076](http://attachments.brighterplanet.com/press_items/local_copies/55/original/employee_engagement_2009.pdf?1265816076)

Cramer, Aron, and Karabell, Zachary (2010). *Sustainable Excellence*. Rodale Inc. New York, NY.

Croom, Simon, et al. (2009). "Sustainable Supply Chain Management - an exploration of current practice." Presented at European Operation Management Association Conference. June 2009.

Department of Defense (2008). "More Fight - Less Fuel." Report of the Defense Science Board Task Force on DoD Energy Strategy. Office of the Under Secretary of Defense for Acquisition, Technology and Logistics. Washington D.C.

Environmental Protection (March 1, 2011). "ISO Energy Management Standard Slated for Release in 3<sup>rd</sup> Quarter." <http://eponline.com/articles/2011/03/01/iso-energy-management-standard-slated-for-release-in-3rd-quarter.aspx>

Epstein, Marc, et al. (2008). *Making Sustainability Work: Best Practices in Managing and Measuring Corporate Social, Environmental and Economic Impacts*. Berrett-Koehler Publishers.

Esty, Daniel, and Winston, Andrew (2009). *Green to Gold: How Smart Companies Use Environmental Strategy to Innovate, Create Value, and Build Competitive Advantage*.

Galbraith, Kate (2009, August 19). "Sustainability Field Booms on Campus." *New York Times*.  
[http://www.nytimes.com/2009/08/20/education/20GREEN.html?\\_r=1](http://www.nytimes.com/2009/08/20/education/20GREEN.html?_r=1)

Haanaes, Knut, et al. (2010, December 22). "First Look: The Second Annual Sustainability & Innovation Survey." <http://sloanreview.mit.edu/the-magazine/articles/2011/winter/52213/first-look-at-the-second-annual-sustainability-and-innovation-survey/>

Heinber, Richard (2010). *Post Carbon Reader*. "What is Sustainability?" Pgs. 13-24. Watershed Media.

Inbound Logistics (2009). "25 Green Supply Chain Partners." *Inbound Logistics*, August 2009.  
<http://www.inboundlogistics.com/digital/green25partners.pdf>

Johnson, Debra (2011). "Does Your Organization Think Green?" *Sustainable Business Forum*.  
<http://sustainablebusinessforum.com/debra-ak-johnson/50333/does-your-organization-think-green?>

Joseph, Damien (2010). "Suppliers set out to grade products with Sustainability Scorecards." *Fast Company*. November 1, 2010. <http://www.fastcompany.com/magazine/150/score-two-for-sustainability.html>

Kanellos, Michael (March 31, 2011). "Ray Anderson and the Power of One." *Greentech Media*.  
<http://www.greentechmedia.com/articles/print/ray-anderson-and-the-power-of-one/>

Kaye, Leon (2011, February 2). "With America behind in CSR Reporting, GRI Opens Wall Street Office." *TriplePundit.com*. <http://www.triplepundit.com/2011/02/america-behind-csr-reporting-gri-opens-wall-street-office/>

Khiewnavawongsa, S. and Schmidt, E (2008). "Green Power to the Supply Chain". Purdue University. <http://www.sbaer.uca.edu/research/acme/2008/34.pdf>

Klein, Eric, et al. (2009). "Greening the Supply Chain: Benchmarking Sustainability Practices and Trends." Greentech Media, GTM Research.

Linton, Jonathan D. et al. (2007). "Sustainable supply chains: An introduction." *Journal of Operations Management*.

Ma, Jun, et al. (2010). "Greening Supply Chains in China: Practical Lessons from China-based Suppliers in Achieving Environmental Performance." WRI Working Paper. World Resources Institute, Washington, DC.

Makower, Joel (2011). "State of Green Business 2011."  
<http://www.greenbiz.com/business/research/report/2011/02/01/state-green-business-report-2011>

MIT Sloan Management Review and Boston Consulting Group (2011). "Sustainability: The 'Embracers' Seize Advantage." MIT Sloan Management Review, Research Report. Winter 2011. <http://sloanreview.mit.edu/feature/sustainability-advantage/>

Mollenkopf, Diane A., et al. (2010). "Green, Lean, and Global Supply Chain Strategies." University of Tennessee College of Business Administration. April 30, 2010.

Moore, Janet (2005). "Barriers and pathways to creating sustainability education programs: policy, rhetoric, and reality." *Environmental Education Research*. November 2005. Pgs. 537-555.

Pinero, Edward (2009). "ISO 50001: Setting the Standard for Industrial Energy Management." *Green Manufacturing News*. Summer 2009, pgs. 21-24. <http://www.greenmfgnews.com/magazine/summer09/iso.pdf>

Robinson, Alan, and Schroeder, Dean (2009). "Greener and Cheaper." *MIT Sloan Management Review and Wall Street Journal*. March 23, 2009. <http://online.wsj.com/article/SB123739309941072501.html>

Rowe, Debra (2002). "Environmental Literacy and Sustainability as Core Requirements: Success Stories and Models." Reprinted from *Teaching Sustainability at Universities*, 2002, Walter Leal Filho, editor, Peter Lang, New York. <http://ncseonline.org/efs/DebraRowe.pdf>

Seif Hattan, Amy (April 2009). *Education for Climate Neutrality and Sustainability: Guidance for ACUPCC Institutions*. American College and University Presidents Climate Commitment. [http://www.secondnature.org/documents/EducationforClimateNeutralitySustainability\\_2009\\_05.07\\_finalWEB.pdf](http://www.secondnature.org/documents/EducationforClimateNeutralitySustainability_2009_05.07_finalWEB.pdf)

United Nations World Commitment on Environment and Development (1987). "Our Common Future". [www.un-documents.net/wced-ocf.htm](http://www.un-documents.net/wced-ocf.htm)

Vincent, Shirley, and Focht, Will (July 2009). "Perspectives on Environmental Program Curricula and Core Competencies." Prepared for the National Council on Science and the Environment. [http://ncseonline.org/CMS400Example/uploadedFiles/01\\_NEW\\_SITE/2\\_Education\\_and\\_Careers/CEDD/Programs\\_and\\_Committees/CEDD%20Phase%20I%20Perspectives%20Report%202009.pdf](http://ncseonline.org/CMS400Example/uploadedFiles/01_NEW_SITE/2_Education_and_Careers/CEDD/Programs_and_Committees/CEDD%20Phase%20I%20Perspectives%20Report%202009.pdf)

Walsh, Bryan (2010). "Tropicana: Trying to Make a Green Orange Juice." *Time Magazine*, March 11, 2010. <http://www.time.com/time/printout/0,8816,1971379,00.html>

Werbach, Adam (2009). *Strategy for Sustainability*. Harvard Business Review.

Wiek, Arnim and Brundiers, Katja (2010). "Education Students in Real-World Sustainability Research: Vision and Implementation." *Innovative Higher Education*.

<http://astepback.com/case%20studies/Educating%20Students%20in%20Real%20World%20Sustainability.pdf>

Winston, Andrew (2010). "Greening Pepsi, from Fertilizer to Bottles." *Harvard Business Review blog*, May 19, 2010. <http://blogs.hbr.org/winston/2010/05/greening-pepsi-from-fertilizer.html>

Woody, Todd (2010). "I.B.M. Suppliers Must Trace Environmental Data." *The New York Times Green Blog*. April 14, 2010.

World Economic Forum (2009). "Supply Chain Decarbonization: The Role of Logistics and Transport in Reducing Supply Chain Emissions." World Economic Forum, with the support of Accenture. <https://members.weforum.org/pdf/ip/SupplyChainDecarbonization.pdf>

Yin, Haito, et al. (2008). "Why Do Standardized ISO 14001 Environmental Management Systems Lead to Heterogeneous Environmental Outcomes?" *Business Strategy and the Environment*. <http://www.erb.umich.edu/Research/Faculty-Research/PastPostDocs/Yin-SchmeidlerISO14001.pdf>