Think Systemically, Act Cooperatively

Reaching the Tipping Point for the Sustainability Movement in Higher Education

By James L. Elder

Abstract

This paper presents the growing trend in colleges and universities to incorporate a sustainability perspective as a social movement. It seeks to catalyze a broader discussion on how best to accelerate progress in institutionalizing sustainability throughout the higher education sector. It reviews the major indicators of the movement's progress over the past few years, analyzes the current status and gaps in the movement's support system provided by national organizations, suggests a vision for the higher education system as a counterpart to vision statements made by individual institutions, and offers an initial systemic approach to the movement's next steps. It asserts that in order to move into the realm of widespread institutional transformation, those involved in the movement will need to: a) think more strategically about where the high leverage opportunities to tip the higher education system lie, and b) cooperate and collaborate in new ways to gain the economies of scale necessary for reorienting this major sector of society. A range of insights and ideas for accomplishing this, resulting from over a decade of study and work within this movement, are presented for further exploration and development.

Keywords: climate change, collective action, higher education, national strategy, social movement, sustainability, systemic thinking

Introduction

In all sectors of society across the United States and the world, individuals and small networks are organizing to meet the great challenges of the 21st century by promoting more sustainable thinking and practices. The higher education sector in particular represents one of the greatest, if often overlooked, opportunities to advance a more sustainable society. To appreciate the impact of this opportunity, consider the scope of higher education:

- The total annual expenditures of the 4,300 two- and four-year institutions were $351 billion (or 3.2 percent of the U.S. GDP) in 2003.[1]
- The total employment is 3.4 million, including 1.2 million faculty.[2]
- The total post-secondary student enrollment is 18 million,[3] expected to increase 23 percent by 2013.
- The total annual building construction spending exceeded $11 billion in 2002, 64 percent of which was spent on new buildings.[4]
- The total annual energy expenditures on campuses are estimated to exceed $6 billion.[5]

Higher education is the nation's incubator for future leaders, as well as the channel for fostering new practices through implementation and experimentation. Higher education prepares most of the professionals who lead and influence society. Higher education institutes create significant economic, social, and environmental footprints. These institutes also have the unique academic freedom, as well as critical mass and diversity of skills, to develop new ideas and engage in bold experimentation in sustainable living. They can conduct critical research and help develop new ideas and technologies, as well as raise the level of discourse regarding societal challenges. In short, as H.G. Wells assessed its impact from a different perspective, "Human history becomes more and more a race between education and catastrophe."[6]

But transforming such an important sector of society is extraordinarily difficult. At a minimum, such transformation requires strategic thinking, many champions pulling in the same direction, and a comprehensive suite of tools, resources, and support, upon which its leaders can draw. In other words, it needs a strong "movement," consisting of a group of people with common beliefs who collectively attempt to achieve certain goals, in the tradition (if not the tactics or rhetoric) of the campus anti-war movement and the campus anti-apartheid disinvestment campaign.

Such societal movements often begin with the isolated efforts of a few individual champions, followed by the connection of these leaders with support

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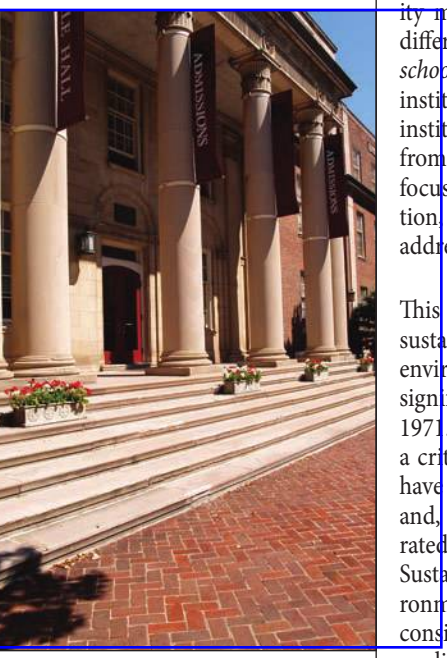
systems and networks that help establish a broader community. This latter step dramatically accelerates the movement's progress by enabling collaboration, mutual support, and synergy.

The sustainability movement in the academic sector is just beginning this transition. There are encouraging signs of initial progress, including some ambitious activities at individual colleges and universities (and the organizations that serve them) and within existing collegiate networks and new networks developed solely for advancing the movement. While the growing momentum for sustainability on many campuses has often come as a result of demands by students who understand that their future is at stake, the challenge of addressing a changing climate is increasingly engaging all dimensions of the campus. As a result, thousands of students, faculty, and administrators at hundreds of colleges and universities are increasingly committed to advancing sustainability.

Environmental programs have often provided a critical platform for the sustainability movement.

While individual schools can and occasionally do change without the external support of a broader movement, this transition is an inefficient, slow, and relatively rare occurrence. For the sustainability movement in higher education to achieve its goals, the change in direction needed on many campuses will only occur by the development of a strong national system that supports change agents and champions on individual campuses.



It is therefore critical to understand the sustainability movement in higher education from two very different yet interrelated perspectives: *the individual school view* (the perspective from inside a single institution that focuses on changes within that institution), and *the support system view* or view from outside a single institution (the perspective that focuses on the movement infrastructure, coordination, and planning). This paper especially seeks to address the latter.

This paper is also focused primarily on the campus sustainability movement rather than on the campus environment movement. The latter has achieved significant success since its launch on Earth Day in 1971. Environmental programs have often provided a critical platform for the sustainability movement, have addressed a critical aspect of sustainability, and, some would argue, are increasingly incorporated within the campus sustainability movement. Sustainability, however, includes not only environmental concerns but also social and economic considerations, with a focus on how to improve the quality of life for all, including future generations. As such, it is a broader, more comprehensive, and more strategic effort than that addressing the environment alone, and its success will engender the further success of the campus environmental movement.

Status of the Movement

Many indicators point to a growing sustainability movement in higher education that has been emerging from the fringe over the past five years or more. The greatest gains to date have occurred in campus operations, particularly in energy conservation and renewable energy, sustainable building designs, water conservation, purchasing, transportation, and chemicals and waste management. The exploding number of schools making aggressive carbon reduction commitments is driving many of these changes.

The following list, culled from *Annual Digest*,[7] which is published by the Association for the Advancement of Sustainability in Higher Education, details many of these indicators.

Broad sustainability indicators

1. The recently passed Higher Education Opportunity Act of 2008 authorized a University Sustainability Program at the Department of Education to offer competitive grants to institutions and associations of higher education to develop, implement, and evaluate sustainability curricula, practices, and academic programs.

2. The Energy Independence and Security Act of 2007 authorized $250 million annually in grants and $500 million in loans for renewable energy and energy efficiency projects at higher education institutions, public schools, and local governments.

3. Several national nonprofit organizations and programs have been established solely to help make sustainability a foundation of learning and/or practice in higher education.

4. More than a dozen mainstream higher education associations now include the advancement of sustainability in their agenda and core programs.

5. More than 700 participants attended the 2006 conference of the Association for the Advancement of Sustainability in Higher Education, and several regional and state conferences are equally well attended.

6. More than 300 campuses have conducted campus sustainability assessments (most within the past five years), and hundreds more are planning to conduct them.

7. At least 250 campuses now have sustainability coordinators/directors or offices of sustainability, and more than 25 percent (1,000) of all higher education schools are expected to have such positions by the end of the decade.

8. More than 500 schools have institution-wide sustainability or environmental committees.

9. Of the 200 colleges and universities with the largest endowments surveyed in the Sustainable Endowments Institute's *2008 College Sustainability Report Card*,[8]
   - 70 percent buy food from local farms,
   - 61 percent have high performance green building projects and green building policies,
   - 45 percent have made a commitment to carbon reduction,
   - 42 percent are using hybrid or electric vehicles in transportation fleets,
   - One third purchase renewable energy or renewable energy credits, and
   - One third actually generate their renewable energy to some extent.

10. A 2006 *University Business* survey found "a distinct trend among colleges and universities toward environmental sensitivity," and therefore "implementing [sustainability] initiatives will likely become a requirement for institutions desiring to be in the mainstream of higher education."[9]

11. Over the past two years, articles about campus sustainability were featured in *Time, Newsweek,* the *New York Times*, the *Washington Post*, *USA Today, Business Week*, *ABC News Online*, and the *Christian Science Monitor*, and frequently covered in the *Chronicle of Higher Education*, *Inside Higher Ed*, *University Business*, and *Business Officer.*

12. *Grist Magazine* named "15 green colleges and universities," *Sierra Magazine* highlighted "10 that get it," *Kiwi Magazine* issued a "green college report," Newsweek's *Current Magazine* designated "[16] schools that care," and *Princeton Review* issued a green campus ranking.

13. Within the past three or so years, several dozen larger universities have attracted multi-million dollar contributions for their sustainability efforts, with several receiving gifts exceeding $20 million to establish sustainability centers or institutes.

14. In a review of 239 broadly defined applied sustainability centers at universities across the globe, the Aspen Institute[10] concluded that the number and size of centers is increasing quickly, that they are attracting significant resources, and that their leadership in sustainability provides an increasing edge in attracting top students, faculty, and companies.

Climate change and energy indicators

1. More than 560 college and university presidents have signed the new American College and University Presidents Climate Commitment.

2. More than 350 large campus buildings have or are "in line" for LEED certification. Many additional buildings are operating within LEED standards but have not applied for certification.

3. The state governments of California and Washington have mandated LEED silver for all new public university campus construction. Several other states provide incentives and assistance for building sustainably designed campus buildings.

4. A 2007 survey conducted by *Building Design + Construction Magazine*[11] found that 85 percent of colleges and universities have incorporated sustainable design principles in recent building projects.

5. The combined purchases of EPA's Top 10 green power purchasers in higher education exceeds 758 million kilowatt hours of green power annually[12] (equivalent to the electricity needed to power 78,000 average American homes).

6. Often as a result of student demand, higher education is now the largest purchaser of wind energy in the United States.

7. In November 2007, 6,000 students traveled across the country to participate in the three-day PowerShift Conference outside Washington, DC, to learn about global warming and to lobby Congress.

8. In January, Focus the Nation (now the National Teach-in on Global Warming Solutions) organized the biggest national teach-in in history, engaging a million students at more than 1,900 institutions in a day-long teach-in about global warming.

Education and research indicators

1. At least 27 higher education institutions launched sustainability-themed degrees, certificates, or academic programs in 2007, up from 22 in 2006 and three in 2005.

2. In 2006, at least 18 schools established new research and academic institutes or centers dedicated to studying aspects of environmental sustainability: alternative energy,

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environmental education, organic agriculture, and transportation. A further 10 sustainability-themed research centers opened in 2007, seven of which focus on the development of renewable energy. Plans were also announced for six additional sustainability research centers and/or partnerships, all of which will focus on new energy technologies.

3. Twenty national disciplinary associations have formed the Disciplinary Associations Network for Sustainability to jointly develop curricula, standards, and professional development programs.

"When society recognizes a need that can be satisfied through advanced education or research and when sufficient funds are available to pay the cost, American universities respond in exemplary fashion."

Former Harvard University President, Derek Bok

Facing the Movement's Challenges

While the movement clearly has an initial foothold, former Harvard University president Derek Bok points out the difficulties ahead:

> When society recognizes a need that can be satisfied through advanced education or research and when sufficient funds are available to pay the cost, American universities respond in exemplary fashion. . . . On the other hand, when social needs are not clearly recognized and backed by adequate financial support, higher education has often failed to respond as effectively as it might, even to some of the most important challenges facing America. . . . After a major social problem has been recognized, universities will usually continue to respond weakly unless outside support is available and the subjects involved command prestige in academic circles.[13]

Individual schools—broad but shallow penetration

While there has been significant change in physical plants and operations on many campuses, the more important changes in teaching and learning are not as prevalent. In the vast majority of schools, these changes have been at best modest—and even then, are almost never as comprehensive as needed.

Indeed, a new survey by the National Wildlife Federation of over 1,000 schools found that

> Academics still lag behind the vision of a sustainable campus—even more so than when this survey was first conducted in 2001. Sustainability-related education offerings and recruitment programs have declined, as have faculty doing environmental and sustainability research. ...Today's student is just as unlikely as in 2001 to graduate with exposure to basic ecological principles, much less with an understanding of how the human-designed economy can work in harmony with natural systems.…Relatively small percentages of campuses offer interdisciplinary degree opportunities in environmental and sustainability studies. Moreover, considerably fewer campuses today require all students to take courses on environmental or sustainability topics.[14]

Equally important, only a handful of colleges and universities are working to comprehensively integrate sustainability into the core values and mission of the institution as well as its curriculum. The unsustainable perspective that currently underlies the core values and mission of almost all schools will therefore ultimately marginalize or defeat any substantial reform efforts.[15]

The difficulties of making deep transformative changes in educational practices are further complicated by the following factors:

- Sustainability is more a way of thinking than a science. As a result (and complicated by the fact that universities are complex systems), campus efforts toward sustainability often suffer from a lack of clear pathways toward a definable end.
- Sustainability work on campuses to date tends to be piecemeal and sporadic, understandably focusing on the low-hanging fruit (energy conservation, recycling, initial changes in purchasing). While such steps are laudable, they inevitably fail to gain full traction, critical mass, master planning, and comprehensive strategies at the institutional level.
- Institutional changes often remain relatively superficial, and are less able to survive changes in institutional leadership, departure of key champions, or loss of external funding.
- With notable exceptions, senior campus leadership is largely absent from the sustainability movement. Faculty and students tend to hold higher levels of interest and commitment to sustainability than do senior administrators, a situation that significantly hinders greater adoption.
- As complex systems, universities rarely have common internal pathways for change. This makes it difficult to develop blueprints for change with wide applicability to other schools. (For a thoughtful exploration of the change process on individual campuses, see Leith Sharp's online article, "Green campuses: the road from little victories to systemic transformation."[16])
- Even as an impressive number of campuses make significant commitments to improving physical plants and operations, many schools now face the difficulty of executing these commitments and often struggle with a critical shortage of institutional capacity for following through.

As a result, the sustainability movement in higher education has yet to comprehensively penetrate any of the three primary higher education functions: education, research, and community outreach/service.

Education. A concerted effort is especially needed to make sustainability the foundation of education for all college graduates. The main barriers to this include the deeply embedded disciplinary structure, how that structure drives the organization of the curriculum and school day, and the faculty reward system, which does not value interdisciplinary work or teaching. There are few incentives or pressures to change these deeply embedded barriers, yet they are precisely the targets at which transformative change must be aimed.

Research. Most sustainability-related research on campus has been focused on the environment, climate change, and energy—in other words, on the science of sustainability. The equally important social and economic fields need to be engaged to the same degree.

Outreach. Despite the huge opportunity for mutual benefit, colleges and local communities are not yet working together to create integrated approaches to sustainability. If students and staff connected their studies with work in local communities to help develop real life solutions to our sustainability challenges, they would simultaneously develop critical implementation skills and knowledge while offering a tremendous community service. (College students themselves, if not their institutions, are engaged in a good deal of outreach through the various student advocacy projects for climate change.)

To penetrate these three primary functions, the time has come for leaders to think more systemically and to act more cooperatively and collaboratively, both in terms of effecting change within individual schools and within the higher education system itself. Only by taking such a leveraged approach will there be a chance to secure the vital change needed within the short time that many believe is remaining.

The support system—emerging but lacking strength

A national movement needs a support system to provide essential "infrastructure"—adequate intellectual and financial capital, a moral framework, visibility and societal attention, and tools to assist leaders inside institutions to surmount internal barriers to change. Such a support system has two primary functions: to provide key support to individual schools and campus champions, and to encourage and support change within higher education's own infrastructure (higher education associations, disciplinary societies, accrediting and regulating agencies, funders).

Some of the support and resources needed by individual campus leaders to take the next crucial steps include:

- Tools: shared protocols, best practices/models, metrics/analytics, training opportunities;
- Capacity: the human resources on campus to execute plans and commitments, specifically, adequate personnel assigned to address sustainability issues, with the power to implement solutions, and adequate expertise (e.g., becoming carbon neutral is a highly technical task, requiring very specific and skilled engineering, architectural, and transportation planning expertise, which rarely exists on campus);
- External support and pressure, including alumni, prospective students, government, funders, employers, and society/media; and a coordinated, systemwide movement from which to draw external support, reinforcement, and information (the lack of which leads to reinventing the wheel when programs, practices, and answers exist elsewhere); and
- Seed funds to address the issue often encountered by movement leaders in securing internal funds (the 1,000-plus schools included in the National Wildlife Federation survey reported that funding is now the biggest obstacle to expanding sustainability programming versus "other (higher) priorities" cited as the biggest obstacle in an earlier survey[14]).

To better clarify the status of the movement's support system from a systemic perspective, Table 1 maps the national and regional players in the sustainability movement in higher education. Table 2 summarizes some of the gaps exposed as a result of this analysis.

A Vision for the Higher Education System

As a transformative way of thinking that evolves with new understanding, sustainability resists the establishment of definitive ends. Architect William McDonough summed up this point when he was asked how long sustainability will take to achieve: "It will take forever. That's the point."[17] Yet it is important to frame at least a tentative vision for the future, if only to help others understand this new direction in more concrete terms. The following scenarios describe some aspects of the higher education system as they approach McDonough's "forever," a forever that needs to arrive sooner than later.

Mainstream higher education associations, as well as disciplinary associations and professional societies, have adopted the advancement of sustainability as a key project and have developed significant ways of helping their member institutions move in this direction. They work together on a regular basis to assess the status of the sustainability movement in higher

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Table 1

Map of 60 Select* National and Regional Players in the Sustainability Movement in Higher Education as of December 2007

The "What", "Who", and "How"	Target Higher Ed Function					Investments	Financing	Institutional Planning and Strategy	Community Outreach	Campus Operations	Energy	Buildings	Food / Dining Services	Waste, Water, Landscaping/Grounds	Purchasing	Transportation	Residential Life	Primary Stakeholder Audience	Faculty	Staff	Senior Administration	Students	Alumni	Trustees	Donors	Employers/Professionals	Accreditors	Host/ local communities	Primary Issue	General Sustainability	Climate change/ energy	Environmental management	Civic engagement	Social justice	Economic development	Faith	Primary Programs/Tools	Curriculum/materials development	Dissemination of best practices	Networking/collaboration	National Event	Training	Pledge	Assessment	Conference	Publications	Legislative campaign
National Networks:																																													
Alliance to Save Energy's Green Campus Program			√							√	√	√							√	√		√								√						√		√				√			
American Council On Renewable Energy (ACORE) Higher Education Committee				√						√	√	√							√	√										√						√		√				√			
Association for the Advancement of Sustainability in Higher Education (AASHE)		√							√	√									√	√	√	√							√	√							√	√			√	√		
Campaign for Environmental Literacy (CEL)		√																											√	√								√						√
Campus Consortium for Environmental Excellence (C2E2)										√										√	√										√						√							
Disciplinary Associations Network for Sustainability (DANS)		√																	√										√						√	√	√						
Higher Education Associations Sustainability Consortium (HEASC)			√		√					√					√				√	√	√	√							√	√						√	√				√	√	
NCSE's Council of Environmental Deans and Directors (CEED)		√		√															√		√		√						√				√			√	√				√		
National Wildlife Federation Campus Ecology Program		√						√		√	√	√	√	√	√	√	√		√	√		√							√	√						√	√			√		√	
US Partnership for Education for Sustainable Development Higher Education Sector Team		√																	√			√							√								√						
Regional Networks:																																												
Associated Colleges of the South Environmental Initiative (ACSEI)		√	√						√	√									√			√					√		√								√					√		
Environmental Consortium of Hudson Valley Colleges and Universities		√																	√			√							√						√		√						
Northeast Campus Sustainability Consortium (NECSC)		√								√	√	√	√	√	√	√	√		√	√	√	√							√	√							√					√		
Northwest Green Campus Initiative										√	√	√		√		√			√	√		√							√														
Upper Midwest Association for Campus Sustainability (UMACS)		√								√									√	√	√	√							√								√	√			√			
Higher Education Associations:																																												
American Association of Community Colleges (AACC)		√																	√	√	√	√							√	√			√				√				√			
College Student Educators International (ACPA)			√																			√							√	√							√	√				√		
Association of Physical Plant Administrators (APPA)										√		√	√	√	√	√	√			√	√								√	√							√					√	√	
Association of College & University Housing Officers-International (ACUHO-I)										√		√					√		√	√	√	√	√						√	√							√	√				√		
Association of Governing Boards of Universities & Colleges (AGB)					√	√	√	√													√		√						√	√				√			√					√	√	
National Association of College and University Business Officers (NACUBO)						√	√														√		√						√	√				√			√	√	√			√	√	
National Association of Educational Procurement (NAEP)										√											√								√	√							√	√				√		
National Intramural-Recreational Sports Association (NIRSA)			√																			√							√	√							√					√	√	
Society of College and University Planners (SCUP)		√			√			√		√										√	√								√	√						√	√	√				√	√	
Disciplinary Associations:																																												
American Academy of Religion (AAR)		√							√										√		√	√							√					√			√							
American Society of Civil Engineers (ASCE)		√		√						√	√	√				√			√			√							√	√							√					√	√	
American Society for Engineering Education (ASEE)		√		√															√		√	√							√								√					√	√	
American Psychology Assocation (APA)		√		√															√			√							√								√					√	√	
American Assocation for the Advancement of Science (AAAS)		√		√															√			√							√								√					√	√	
American Institute of Architects (AIA)		√								√									√			√							√								√					√	√	
International Society for Ecological Economics (ISEE)		√		√															√			√							√			√	√		√		√					√	√	
National Campaigns, Pledges, and Events:																																												
American College and University Presidents Climate Commitment (ACUPCC)					√					√									√	√	√	√	√				√		√	√							√	√	√		√			
Focus the Nation (FTN)			√						√										√	√	√	√								√		√	√					√	√	√	√	√		√
Graduation Pledge Alliance			√						√													√	√						√				√								√			
The Food Project's Real Food Challenge			√							√			√									√														√	√	√						
The Talloires Declaration		√		√					√	√											√								√	√							√				√			
National Student Groups:																																												
Energy Action/Campus Climate Challenge			√		√				√										√		√	√					√			√								√	√	√	√	√		√
California Student Sustainability Coalition (CSSC)			√		√				√	√	√	√	√	√	√	√	√		√	√	√	√							√	√								√						
Free The Planet			√						√	√												√							√	√		√	√					√	√	√		√		√
Greenpeace Student Network			√						√	√												√							√	√								√		√				√
National Association of Environmental Law Societies (NAELS)			√						√												√	√			√					√	√	√	√				√						√
Net Impact Campus Greening Initiative (CGI)		√								√									√		√	√			√				√			√			√	√	√						
Rainforest Action Network Youth Sustaining the Earth (RYSE)			√							√												√							√	√			√					√		√				√
Restoring Eden			√						√													√							√	√			√		√			√						
Sierra Student Coalition (SSC)			√						√													√							√	√		√						√						√
Student Environmental Action Coalition (SEAC)			√						√													√							√	√		√	√					√						√
Student PIRGs			√						√													√					√		√	√	√	√	√					√		√				√
Students United for a Responsible Global Environment (SURGE)			√						√													√							√	√		√	√					√		√				√
National Nonprofits:																																												
Advanced Technology Environmental Education Center		√		√															√			√				√			√		√					√				√				
Clean Air Cool Planet										√																√	√			√						√						√		
College and University Recycling Council (CURC)										√					√					√		√									√					√	√				√		
Community University Consortium for Regional Enviro. Justice (marginal)									√																	√					√	√						√					
Environmental Justice and Climate Change Initiative (EJCC)			√						√												√					√			√	√		√	√				√						
LCV Education Fund Student Conservation Voters Project			√						√													√								√												√
Responsible Endowments Coalition					√	√	√												√		√	√	√	√	√				√			√	√				√		√				
Second Nature		√			√			√	√	√										√	√								√	√			√				√	√						
Sustainable Endowments Institute					√	√															√		√	√					√				√	√								
U.S. Green Building Council										√	√	√	√	√		√	√			√	√			√					√								√					√		
World Resources Institute Sustainable Enterprise Program		√		√	√	√													√		√								√	√		√	√	√							√		
Government Agencies:																																												
EPA's College and University Sector program										√									√		√					√					√						√				√			

* This chart includes only organizations identified as having a major higher education sustainability-related program. Classification of these organizations' activities, primary targets, audiences, issues, and programs/tools was often by necessity subjective, and the author apologizes to any who feel misclassified.

Table 2 Gaps Identified in the Sustainability Movement in Higher Education

National "Infrastructure" Elements	General Status
Professional Development Opportunities:	
National/regional/state networks and associations	In place, not yet strong
National/regional conferences	In place, not yet strong
Publications/professional journals	More needed
Faculty and administrator workshops	More needed
Tools:	
National surveys/assessments	In place, not yet strong
Institutional benchmarks	In place, not yet strong
Curriculum standards/guidelines	More needed
Technical support/manuals	Very spotty, improving
Comprehensive web support	In place, not yet strong
National political presence	In place, not yet strong
Funding:	
Federal	In progress
Private foundations	More needed
Stakeholder Engagement Opportunities:	
Students	Relatively strong
Senior Administrators	More needed
Academic/professional associations	In place, not yet strong
Employers, Alumni, Trustees, etc.	Almost non-existent

education and plan the next steps with national higher education leaders. A new higher education "think-do tank" has been established to help develop and promote sound policies on and new thinking about sustainability in higher education while incubating new projects to fill gaps in the movement.

The progress being made on sustainability by each of the 4,300 higher education institutions is transparent, measured with common metrics, and easily accessible to all. Faculty have adequate publishing, networking, and training opportunities. Curricula and teaching materials have been rewritten in most disciplines to reflect a sustainability perspective. Programs have been established that help practicing professionals in all fields understand and incorporate sustainability in their work and careers.

Academia is actively informing and providing the intellectual tools for other societal sectors, as well as the public at large, in making the transition to a sustainable perspective. Higher education has joined business to become a driving force behind the sustainability movement. Businesses committed to sustainability have formed an alliance to encourage and support individual schools and higher education as a whole to produce sustainability literate graduates. They work together to ensure that the employment needs of the emerging green economy are met. Federal and state legislation is in place that encourages and supports the efforts of schools to incorporate sustainability, and a large number of schools collaborate in ongoing development and advocacy work of sustainability policy. Regional accrediting agencies include sustainability in their accreditation criteria, and higher education funders include sustainability in their grant-making criteria.

The Next Steps: Moving Sustainability from Good Intentions to Realizing the Vision

The sustainability movement in higher education has emerged organically rather than from a commonly agreed upon plan and strategy. It is now time for the movement to frame a master plan that identifies the leverage points to enable it to reach a tipping point. The following suggestions will hopefully inspire others to expand upon these ideas.

In general, the movement needs to focus on exerting positive pressure on colleges and universities, as well as on mainstream higher education organizations, to infuse the values of sustainability into their institutional culture. In particular, greater attention needs to be paid to the following goals: development of mechanisms for truly transformative change; implementation of changes to teaching and learning, in addition to the operational changes already

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underway; addressing the health, economic, and social justice aspects of sustainability, in addition to the current emphasis on energy and environmental protection; coordination and collaboration among the movement's players; increase of funding for the movement itself, as well as for sustainability initiatives on individual campuses.

While by no means an exhaustive list, the following five strategy points address the above goals in greater detail.

Increase the demand for higher education to adopt sustainability

The map of key players (Table 1) shows that, while many stakeholder groups inside colleges and universities are engaged, little work is being done to organize and support groups of *external* stakeholders to use their collective weight to influence higher education. Internal stakeholders (administrators, faculty, operational personnel, and students) operating alone simply cannot change the direction of higher education to embrace sustainability by themselves; strong outside influence is needed. Key external stakeholders, such as employers, funders of education and research, accreditation organizations, parents, prospective students, alumni, and host communities, are all critical to creating the demand for education for sustainable development, and all must be mobilized. Examples of such initiatives for increasing demand might be:

- Create an alliance of the growing number of major businesses committed to sustainability to call for and work with higher education to produce sustainability-literate graduates as well as a sustainability-literate workforce;
- Launch an effort to support cities and towns committed to sustainability to collaborate and partner with their local higher education institutions (e.g., Louisville's Partnership for a Green City in Kentucky);
- Publish and widely distribute a sustainability guide to colleges and universities, developed from a prospective student's perspective, to inform them about a school's commitment to sustainability; and
- Enlist and support those college and university trustees with a commitment to sustainability to work together to infuse sustainability values into their institutions.

Integrate sustainability into the higher education mainstream

While sustainability is beginning to penetrate the higher education mainstream, it has yet to become mainstream. Becoming mainstream would mean that sustainability is not only embedded in the values and culture of individual institutions but also in the values and culture of the entire higher education system itself: the accrediting standards, grant-making criteria, disciplinary society curriculum frameworks, national and state policy-making, and so on. The forces of change thus need to move from the fringe, where they now exist, into the core of higher education in order for the needed transition to be realized. In particular, the more than 100 learned societies and higher education professional associations promoting sustainability need to be fully enlisted and engaged. While initial efforts on this front are underway, much more can and needs to be done.

Change the rules of the game to favor sustainability

The rules of the higher education system provide incentives, punishments, and/or constraints, and these rules need to change to favor sustainability. At the system level, the rules are largely written by accrediting agencies and, to a lesser extent, government (e.g., environmental, health, and safety rules; higher education taxes). Rules at the institution level (faculty hiring, tenure, and reward policies) are equally important to address. Efforts to change the rules at both levels are far more likely to be successful when there is collaboration among leaders from many schools to build pressure and momentum. A major example would be a thoughtful and concerted effort to convince the six regional higher education accreditation agencies to include sustainability in their accreditation criteria.

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Influence the system's money flow to support sustainability

Higher education institutional budgets total more than $350 billion and include significant expenditures that could be adjusted to include, or be redirected toward, sustainability purposes. In addition, colleges and universities often have powerful fundraising machines that could be oriented to raising funds for sustainability purposes. For example, during the past two years, sustainability grants of $1 million or more to individual colleges and universities totaled more than $150 million ($60 million to Stanford University alone[7]). Also, consider the significant government funding for higher education (approximately $100 billion[18]); virtually none of these funds are directed toward sustainability. Some possible initiatives include:

- Convince the major funders of campus physical plant improvements to require inclusion of sustainability considerations in building and transportation design criteria;
- Convince Moody's Investors Service to include campus energy policy in establishing bond ratings for colleges and universities, which would dramatically increase the attention given to this issue by senior administrators; and

- Convince more private foundations to invest in the potential of this movement, perhaps joining a "collaborative fund" where their funds are pooled, leveraged, and subsequently distributed with help from experts in the field.

Strengthen the movement's national support system to promote change on individual campuses

Executing the previous four strategies cannot be accomplished without a healthy national support system; unfortunately the map of players indicates that existing support system's capacity is not yet strong (Table 1). While various national organizations are tackling pieces and projects consistent with their organizational mandate, few are looking at the whole higher education system to identify and exploit high leverage prospects. Few if any are routinely scanning the horizon for opportunities, analyzing the relevant educational systems from a systematic perspective, studying and developing critical policy, or creating and launching innovative initiatives to address key leverage points. And there is no incubator to help the few strategic initiatives that do get launched become successful and part of a larger and more coherent whole.

As existing national support programs focus on specific pieces, such as carbon reduction commitments, securing federal funding, providing information resources, or creating institutional metrics, some mechanisms are needed to enable movement leaders and organizational players to work together on an ongoing basis to:

- Connect and coordinate existing efforts to rapidly accelerate the movement;
- Continue to look for internal and external leverage points that can take existing efforts to a much higher and broader level;
- Develop new high leverage programs and projects;
- Raise the awareness and commitment level of society's and higher education's leaders about the needs, opportunities, and actions to help the movement and how it is in their interest to support these changes;
- Catalyze new financial resources and support;
- Establish an up-to-date and transparent feedback system—a new information loop––that tracks how well higher education is doing, establishing benchmarks and a better understanding of the status quo.

Conclusion

The prominence of the sustainability movement in higher education has accelerated dramatically over the past few years. A tipping point where sustainability becomes part of the foundation of education for all college graduates, with a goal of educating citizens for a world experiencing its systems in flux, now appears to be reachable. But still remaining are deep barriers to embedding the values of sustainability into institutional cultures, such as the disciplinary structure and faculty reward systems. Presently, there are few institutional incentives to overcome these barriers, yet this is precisely the place where transformative change must occur. Only by thinking more strategically and systemically while operating more collectively and developing a strong national infrastructure for support can these barriers be surmounted and a tipping point be reached.

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