Proposal for Action

Architecture is a subset of a larger field, ecological design. This is the larger art of fitting the pieces of a society into a coherent pattern of fairness, resilience, and sustainability. If architecture is a subfield of that, then its role is to lead the coalescing of the energy flows, water, and biota into something that meets those characteristics (fair, sustainable, resilient, and beautiful).

Then you face the question, "Do you start the students with specifics or with the big picture?" The conservative approach is to learn the basics first, then big picture. The other, perhaps more radical, view is to start with ethics and big picture. Actually, you have to do both. All education should orient people to "here is where we are"—you are on planet earth, it has a biosphere—and then begin to relate architecture to the realities of the biosphere and learn about the evolution of the built world.

— David Orr, Environmental Educator/Author, Oberlin College, 2005

Chapter 5 captions (clockwise)

Students collaborating in John Quale's ecoMOD course (University of Virginia), which received special recognition in this report (see page 61). Photo by ecoMOD

A student records light levels at the January 2004 Agents of Change workshop at the Burton Barr Central Library (Will Bruder) in Phoenix. Photo courtesy of Agents of Change

The Solar Decathlon entry by the Virginia Polytechnic Institute and State University team earned top honors in the Architecture and Dwelling category and also earned the AIA Presidential Citation for excellence. Photo by Chris Gunn/ Solar Decathlon

Visitors, including hundreds of elementary school students, crowded the Mall to view the solar homes at the Solar Decathlon. Photo by Stefano Paltera/Solar Decathlon

CHAPTER 5: PROPOSAL FOR ACTION

THE AIA COTE CENTER FOR ECOLOGICAL DESIGN

The Kendeda Sustainability Fund, the donor-advised fund at the Tides Foundation that is behind this project, was created in 2003 to explore how to "live within the limits of the natural world in ways that promote community, equity, prosperity and health." These are symbiotic with the stated goals of the AIA and its Committee on the Environment. Throughout this report, we have opted to use a broad definition of sustainability. The impacts of various forms of human consumption are increasingly evident, and impacts of human-caused climate change are increasing.

The challenges are many and great. This is a moment for bold action. The AIA COTE and the authors of this report believe the most comprehensive way to advance the level of ecological literacy in architecture education and in practice is to establish a national Center for Ecological Design (CED), which would focus on this topic as a project of the AIA's Committee on the Environment.

The broad mission of the CED will be to investigate ways to elevate ecological literacy in architecture education and throughout practice. Specifically, the CED would generate projects, research efforts, and curriculum support mechanisms to bring ecological literacy to students training to be architects. The organization would be flexible in terms of collaboration, scope, and partnering.

By definition, the CED would partner with existing groups across disciplines and emphases. Some of the proposed groups focus on sustainability in education, others on bringing sustainability into architecture education and practice. A suggested (not comprehensive) list of such possible partners is included at the end of this chapter. While communication with some of these groups has occurred, not all groups mentioned here have been contacted about this report.

Perspective
Just how urgent is the problem? One practitioner, Edward Mazria, AIA, has been urging fellow architects to wake up to the science.[1] Mazria has called architects to task, citing the building industry as responsible for approximately one-half of all global warming emissions. Most climate scientists agree that since the beginning of the 20th century, the earth's mean surface temperature has increased by about 0.6° centigrade.[2] The 2° rise is widely acknowledged as a threshold between danger and disaster. If we continue on our present course of burning fossil fuels, we could reach 2° centigrade by 2050. To avoid reaching that threshold, Mazria suggests that "all new buildings and major renovation projects must be designed to use half the fossil fuel energy they would typically consume. This reduction standard for new buildings should increase by 10 percent in 2010 and another 10 percent every five years after that, to arrive at carbon-neutral buildings—those that use no fossil fuel energy to operate—by 2030."

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[1] See Appendix for link to Pew Center on Global Climate Change Study: Towards a Climate Friendly Built Environment (Oak Ridge National Laboratories, June 2005) and the joint science academies' statement calling for global response to climate change (June 7, 2005)
[2] See Intergovernmental Panel on Climate Change, *www.ipcc.ch/,* and the Union of Concerned Scientists, *www.ucsusa.org/global_environment/global_warming/page.cfm?pageID=515*

Mazria calculates that each year in the United States, we tear down approximately 1.75 billion square feet of building, renovate 5 billion square feet, and build new another 5 billion square feet. During the next 30 years, some 50 billion square feet will be torn down, some 150 billion will be renovated, and another 150 billion will be built new. By 2030, three-quarters of the built environment will be either new or renovated. While that is a scary prospect, it also represents a unique opportunity. He believes architects can make a big change and have a huge impact in addressing what he calls "humanity's greatest challenge." Mazria calls for professional architecture and planning schools to establish "mandatory, innovative, studio-based, full-year programs relevant to climate change and incorporate a deep understanding of the relationship between nature and design in all core courses." Given the urgency of the challenge, continuing education for professionals along these lines should also be a priority.

Where there is clearly a need throughout architecture education (and more broadly in higher education in general and in youth education before that), Mazria's emphasis on the studio aspect of the architect's education is one that many other practitioners share. They are frustrated that the bulk of environmental information that students receive is relegated to environmental systems courses and the occasional sustainability-infused studio to which only a few students are exposed. (Many others, including many of those who are seeking the most rigorous design instruction, actually avoid these.) Studios are elective and subject matter is autonomously determined by instructors, yielding to a frustrating lack of permeation—this in the face of what some report to be a continuing growth in student awareness and desire for deep, thorough, studio investigation of such topics.

Randolph Croxton, FAIA, who participated in founding AIA COTE meetings and was a board member and liaison to the AIA COTE during the committee's first few years, is often asked to give lectures at campuses around the country. He notes the invitations emanate from student groups, green campus organizations, or deans, and rarely design faculty. The university schools and departments that are leading sustainability education—business, real estate, construction, forestry, and various branches of the natural sciences—are rarely the architecture schools. After lectures or juries, he is often asked by enthusiastic students what schools of architecture he can recommend with sustainability fully integrated within the design curriculum. "I can only give partial recommendations since the progress that has been made is usually in partial content of the main design studio, or more likely, a separate course or activity," Croxton says. "Until there are faculty who have fully integrated sustainability as a central design value, an inherent dimension of design excellence in the design studio, there will be no good answer to this request."

There is also an evident need to include systems ecology in the architect's education. "We must not set the table too small," reminds Daniel E. Williams, FAIA, 2003 AIA COTE chair. He champions the inclusion of the work and writings of E. O. Wilson, H. T. Odum, Eugene Odum, and Robert Costanza. "The integration of systems ecology into architecture education is absolutely critical."

Activities

For this report, a broad set of activities the CED could undertake has been outlined. The authors believe that being specific about the kinds of projects the CED would undertake would be the most effective way to illustrate how the center would work and the reach it would have.

Some of these ideas have emanated from conversations with people mentioned in this report; some are obvious outgrowths of existing groups (who may already be pursuing similar phases themselves). They range from practical and measurable to more strategic and far-reaching. It is

hoped the ideas illustrate the wide range of what is needed and what is possible. (In some cases, possible partners and consultants for specific projects have been identified.)

As currently defined, some of these activities overlap with one another and this list is by no means comprehensive. Subsequent planning with project partners would refine and shape the specific tasks and the structure of the CED itself.

Several of these activities could and should begin right away, even as the particulars of a center are assessed. As overall framework and budget issues are reviewed (the AIA declines to release specific budget details at this time), seed funding could be put to immediate use for workshops, research, publications, and curriculum development.

Planning the AIA COTE Center for Ecological Design
The coauthors of this report and the organizers of the ELAE program would meet with representatives from the Cloud Institute for Sustainability Education and the Center for Ecoliteracy. The meetings would facilitate a discussion of the ongoing initiatives aimed at broader education for sustainability, how these initiatives should inform design education, and what the first and long-term goals of the CED should be. There would be concurrent consultation with the Tides Foundation and Second Nature. A facilitated teleconference with the grant recipients/educators, their deans, and several other individuals would collect feedback and input following the publication of the report and proposal. It is possible this effort could be underwritten by remaining planning grant funds.

Hosting a Biannual Summit
Several influential sustainability conferences have occurred in the past, including annual conferences of the Society of Building Science Educators, the Association of Collegiate Schools of Architecture, the American Council for an Energy Efficient Economy, and the U.S. Green Building Council. Although these conferences raise overall awareness of sustainability, the AIA COTE Center for Ecological Design would focus on professional curriculum development for ensuring depth in sustainability through biannual conferences with specific goals and outcomes.

The conferences would address

- *Foundations of Design Education for Sustainability*: A look at best practices, a discussion of learning and teaching methods, and a structured workshop to design seminal foundations courses. The workshop would also address the issue of developing core courses that can be easily transferred from one institution to another.
- *Curricular Transformations for Sustainability*: What would real transformation of architecture curriculum in schools of architecture look like? What future changes to the National Architectural Accrediting Board's requirements might support this transformation?
- *The Marketplace and Education for Sustainability*: The marketplace is a player in education today. The marketplace, concerned with "what sells," has a proclivity to limit the definition of sustainability, but could be reversed if sustainable education created new marketplaces for professionals.
- *Beyond Buildings*: Sustainable design requires an understanding of biology, hydrology, ecology, land-use decision-making, infrastructure engineering, chemistry, and material science—a host of subjects that go well beyond the elements of buildings. How can university curriculum teach awareness about scale, connection (as in Charles and Ray

Eames's *Powers of Ten*[3] concept), and innovative design processes necessary for this ecological interdependency?

- *Architecture for Generations*: Previous generations of architects designed for centuries, today's projects are often designed for decades. Sustainable design requires a commitment to longevity through "cherishable" quality, design for adaptation, and design for deconstruction and reuse. Educational innovation must embrace postoccupancy evaluation.
- *The Collaborative Design Process*: Given these challenges—design beyond buildings and design for generations—sustainability education will need to develop new collaborative design processes. These processes will be multidisciplinary, participatory, iterative, just-in-time, and responsive to ongoing changes in cultures and in the science of sustainability.
- *An Architecture of Place*: Knowledge of climatic, geographical and cultural diversity, and expertise in the region of practice is critical to sustainability. The identification of courses that champion regions and cultures, and the development of curriculum that embraces the liabilities of climates and the natural conditioning assets will be key to curricular innovation.
- *Sustainable Benchmarking Tools and the Classroom*: What is the role of rating systems, simulation tools, and physical testing tools in the architecture education process? A study of how these quantitative tools are being used in the classroom and their effectiveness and their meaning in continuing education is an important aspect of architecture for sustainability.
- *International Curriculum and Benchmarking Tools for Sustainability*: How are emerging standards and measures of sustainability changing education and practice in Europe and Asia and how does this relate to U.S. education and global architecture practice?

Using the AIA COTE Top Ten Measures of Sustainable Design as a Curriculum Tool

The AIA COTE Top Ten Measures are the basis of a definition of sustainable design that is broad and deep. The measures use an approach that holistically and creatively addresses land use, site ecology, community design and connections, water use, energy performance, energy security, materials and construction, light and air, bioclimatic design, and issues of long life and loose fit. The narrative measures and their associated metrics, initially developed and still used for the AIA COTE Top Ten Green Projects Awards, are a well-developed framework that could adapt easily into a curricular framework for different types of courses or an entire program. The CED would identify a team of educators and practitioners to work together to create teaching modules based on these measures and their evolution.

Trading the Mentor Model for an Ecological One

Many educators, ecological thinkers, and practicing architects believe that how ecological literacy is taught is as important (or even more so) as the content of what is being taught. At many architecture schools, the mentor model is still firmly in place; students are "filled up" by the knowledge of a professor. Some educators, however, have begun to teach using an ecological model—multidisciplinary, participatory, iterative, designing for place, designing across time. Students are becoming more involved in framing the questions, shaping courses, and interacting with practitioners and in the community. A workshop with leading education experts (including

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[3] Charles Eames said, "Eventually, everything connects." This statement is perhaps the briefest way to summarize what is missing from contemporary design dialogue. The Eames's seminal film, *Powers of Ten*, is an exploration of connectedness and relative scale.

several from university centers for teaching excellence), ecological thinkers, and architecture educators would be an opportunity to explore some leading models and their outcomes based on comparisons and analysis of classroom results.

Relating Method to Content
The CED could embark on a study about how ecological and sustainable foundations and creativity are being taught and how method and content relate. One segment of the work could be to identify a few key programs that are trying innovative ideas to track over time. Another segment of this work might address how systems theory is rendering the linear model less effective for some knowledge bases. There is ongoing research on the impact of electronic communications on human brains and capacities for learning. There are also benefits when students are being taught to do research and engage information in cumulative and collaborative ways. Information and learning methods and aptitudes are changing shape. How is this affecting the methods and the content in the architecture classroom?

Mapping the Strengths and Gaps in Teaching Methodologies
The CED would expand on this report through additional, ongoing research to identify the means and methods through which schools are embracing ecology. An annual survey similar to the Design Intelligence survey of architecture schools would rank programs according to criteria based on ecological literacy.
> *Possible partners/consultants: Association of Collegiate Schools of Architecture, National Architectural Accrediting Board, various universities, Design Intelligence*

Analyzing Software Tools in the Classroom and Office
Much software is being used in architecture classrooms across the country. A panel of experts, including such people as Harvey Bryan at Arizona State University, Susan Ubbelohde at the University of California-Berkeley, and Mark DeKay at the University of Tennessee, could be tapped to discuss what should be learned and shared from the classroom. Representatives from firms could participate to see where crossover lies and discuss what next steps should be.
> *Possible partners/consultants: AIA Technology in Architectural Practice Knowledge Community and various university research centers*

Hosting Workshops
The CED would design and facilitate multiple-day educational workshops with the best ecological thinkers and practitioners to reveal the breadth and depth of courses, curriculum, tools, and process innovation for sustainability. A series of workshops for teachers who are (or want to be) teaching ecological literacy in their architecture courses could be established with an assembly of outstanding course modules from universities nationwide. These modules would address the spectrum of disciplinary knowledge areas needed for design professionals and the spectrum of curricular vehicles, including studio, lecture course, seminar, lab, design-build, campuswide project course, and community design project.
> *Possible partners/consultants: The Cloud Institute, Second Nature, Society of Building Science Educators, and U.S. Green Building Council*

Offering Continuing Education for Professionals
Some university courses focused on sustainability currently offer AIA Continuing Education credits for professional participation (such as Bruce Haglund's graduate sequence at the University of Idaho, Arch 510-556). The CED could create a set of model characteristics and propose the model for architecture schools.
> *Possible partners/consultants: National Council of Architectural Registration Boards and U.S. Green Building Council*

Identifying Games Designers Play

The CED could identify services and tools that have been effective in facilitating sustainability-framed design charrettes that demonstrate the process and significance of integrated design and interdisciplinary collaboration. These services and tools could be introduced into schools of architecture and continuing education programs.

Publishing

The AIA COTE Center for Ecological Design would undertake a range of professional literacy endeavors:

The Eco Design Reader. A *Utne Reader*-style collection of articles and papers, as well as commissioned articles about ecological literacy education in architecture education and ecological design.
> *Possible partners/consultants: The Cloud Institute and Society of Building Science Educators*

Journal of Ecological Literacy in Architecture Education. A peer-reviewed journal focused on teaching ecological literacy, ecological design, environmental systems, and other related courses in architecture education. The Society of Building Science Educators has long discussed the possibility of such a journal and there are several interesting models that could be considered.
> *Possible partners/consultants: Society of Building Science Educators and Association of Collegiate Schools of Architecture*

Books. Working with AIA publishing partners and other publishers, the CED would publish books about teaching ecological design and related subjects. In addition, the CED would develop an illustrated textbook to reveal the interdisciplinary and inspiring design depth behind critical elements of sustainability.
> *Possible partners/consultants: John Wiley & Sons Inc., Taunton Press, and Ecotone*

Seeking the Sustainability Story

The theme for Global Possibilities' 1999 annual symposium for a solar future was Rethinking Design Curriculum: Integrating Solar Energy for a Sustainable Future. The 40 participants—mostly educators and deans—were divided into groups to tackle questions, including "What story would you create, or have you created or heard, that describes the importance of design in a sustainable society?" The response sought was for a story that replaces the description of design in industrial society. The group responding to this question included Gary Coates, a professor at Kansas State University, Hilary Brown, an adjunct professor at Columbia University, Ed Dorsa, an associate professor at Virginia Tech, and John Reynolds, a professor at the University of Oregon. Their response was summarized this way:

> We found that there are not yet commonly shared meta-stories. We might begin to envision a meta-industrial society, not as an alternative to, or as a contradiction of, but as the logical, necessary and desirable transformation of industrial civilization. This more sustainable, humane society would actually realize the purposes, dreams, and ideals that have moved generations by means of the Industrial Revolution. We should build this new story around the idea of interdependency and make that a motivating framework.

That lack is still with us and filling it should be a priority. A compelling narrative about the sustainability imperative story is critical to gaining public awareness about the real aims and taking things beyond "eco" and "green" labels. This is not a story about "green features" or new technologies, though both things have a role. This is a story that involves history, evolution,

science, and morality. It is about methods, research, and what it means to be human and to make things in the world. Told properly, the story will sound like a new language and will be a potent virus. Creating the story would be a collaborative exercise with a group of writers, interviewers, architects, and educators (likely including some of the "champions" mentioned in this report and other pioneers), and a draft could be created through a series of calls and Web-based communications. A workshop on the topic (at one of the biannual conferences) would bring the document to a sharable state.

Possible partners/consultants: The Cloud Institute and Second Nature

Seeking Other Documentation

There are other aspects of documentation that are important to this effort. The CED should author a timeline of architecture education framed by sustainability and an illustrated timeline of environmentally driven architectural practice over centuries. Understanding where we have been and where we are going is important here. Learning about Vitruvius as one of the first systems thinkers in the Classical world, as Orr has suggested (see Chapter 2), can be part of a powerful reframing of history. This document would be shared electronically and input welcomed via an electronic bulletin board.

Possible partners/consultants: Environmental Building News

Creating a New Curriculum Beyond the University

The CED could lead an effort to create a new model for architecture education outside the confines of the traditional university setting. Knowing what we know about the strength and limitations of university paths, as well as the strengths and weaknesses about other models (Taliesin, Ecosa Institute, Yestermorrow, and others), a group of educators and practitioners would re-imagine the process in a facilitated workshop setting. What kind of organizational structure would create a set of assumptions and explorations that would allow students to understand architecture as a part of ecological design? The right team would generate a strong vision and a plan with significant level of detail to make implementation possible.

Sponsoring a Competition

The CED would run a Top Ten Green Projects student competition, which would be integrated with the AIA COTE Top Ten Green Projects award program. Submissions would be judged according to the Top Ten Measures (but not Metrics). Interdisciplinary collaboration would be encouraged in the hope of spurring more interdepartmental activity in the universities. The resulting collection would become a traveling exhibit available to local COTEs and schools of universities, as well as any other interested organizations.

Possible partners/consultants: American Institute of Architecture Students

Offering Grants to Educators and Firms Collaborating with Schools

Because architecture is both an art and a science, it sometimes seems that getting grants on either "side" of that balance is a challenge. The CED would address this issue by setting aside funds for distribution each year following proposals from educators who would be invited to apply for grants to support guest lectures, ecological literacy-based studios, interdisciplinary team teaching or other interdisciplinary activities, green symposia, research tools, training workshops (for students, teaching assistants, teachers, and professionals), research activities (see Promoting Research below), collaborations with professionals, and other activities.

Providing Resources for Educators and Professionals
The CED would create a list of sustainability references, DVDs, and software for different levels of expertise, and arrange to have these available through Amazon and the AIA Store with discounts.

> *Possible partners/consultants: Association of Collegiate Schools of Architecture, Society of Building Science Educators, American Institute of Architecture Students*

Promoting Research
"Energy is a design topic, not a technology topic," says Don Watson, FAIA, of EarthRise. "There are a few of us who have always believed this." Watson taught at Yale University and Renssalaer Polytechnic Institute, where he was also dean, and was involved with the AIA's Energy Committee and COTE from the late 1970s. Watson has called the period from 1976 to 1986 a "golden moment" in architectural research in the United States, from which schools of architecture and the profession benefited enormously. "At that moment, we knew more about designing energy efficient buildings than anyone in the world." The CED would seek to express and embody the AIA's appreciation for research as something valuable for practitioners and universities.

Vivian Loftness, FAIA, 2005 AIA COTE chair and professor of architecture at Carnegie Mellon University, has identified that

> The combined budgets for building research across the federal government is less than two percent of federally funded R&D, in no way commensurate with the importance of the built environment to our economy and quality of life. Given this paucity of research support, there are only a handful of university Ph.D. programs focused on energy efficiency and environmental quality in the built environment, compared to many dozens of universities with federally funded research related to nano-technology and information security for example. Given that the building sector is 20 percent of the U.S. economy, over 35 percent of U.S. energy use and associated environmental quality, and significantly linked to the health and competitiveness of our nation, the federal sector must move beyond today's marginal funding of research in the built environment.[4]

The CED would urge congressional leaders to clearly state in allocations for the National Institutes of Health and National Science Foundation that a dedicated research funding stream of 5 percent be established to fund research in a sustainable built environment, including multidisciplinary centers of excellence, in order to fully understand the potential of design to reduce health and environmental costs in the United States. These are fundamental and applied research questions that have insignificant funding, public or private, despite the major role buildings play in our economy, health, quality of life, and environment.

Identifying Research Partnerships
These partnerships would be among universities, professionals, and industry (some of these are already finding one another through the EPIC Project and the AIA's Educator/Practitioner Network). Many people are already doing important work, and the CED would extend, build on, transfer, publicize, and support that work, as well as link it to the profession in ways that may not already be in play.

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[4] "The Impact of Federal Energy Efficiency and Renewable Energy R&D Programs," presented to the Energy Subcommittee of the House Science Committee, May 19, 2004.

Possible partners/consultants: Architectural Research Centers Consortium, Society of Building Science Educators, Second Nature, Gund Institute, and several university research centers

Developing Daylighting and Systems Laboratories

Daylight is a significant driver of ecological design and measurement is key to understanding. Every school of architecture and its community should have daylighting and/or integrated systems labs of the highest caliber. While the National Science Foundation fully supports the development of chemistry, materials, physics, and other science and engineering labs, they explicitly disallow applications for building science labs, arguing that they do not support budgets for buildings and that architecture is an applied, not fundamental, science. In addition, the building industry has only modest investments in university research or demonstration, despite the power of learning enabled by hands-on laboratories. The CED would work with the entire design community to challenge these decisions. Recent research is revealing that environmental education enhances learning, especially environmental education that engages the students with the facility itself.[5]

Linking Human Health and Buildings

The link to human health is still one of the most important and potentially transformative aspects of sustainability. This is also a subject that provides ample opportunity to links with such other disciplines as interior design, medicine, and industrial design. As one means of highlighting the importance of health, the CED could sponsor such initiatives as awards programs or competitions recognizing projects that successfully bring ecological design into complex buildings and buildings with heightened occupancy needs.

Possible partners/consultants: AIA Academy of Architecture for Health and National Institutes of Health

Using the Case Study Approach

Steven Moore of the University of Texas-Austin wrote about his coursework (in his submission to the ELAE grant program): "Architectural practice requires knowledge that is scientifically, ecologically, and culturally responsible. The best way to engage graduate students in the production of such knowledge is through the case study method."

Sponsored by the Large Firm Roundtable and the Educator/Practitioner Network, the AIA Case Studies Initiative was launched in September 2001 to produce an online database of case studies that analyze and document projects in the context of professional practice. From the start of the effort as an extension of the Large Firm Roundtable discussions between deans and practitioners (1998–2000), it has been conceived that case studies could originate in either venue with the hope that bridges would be built between them. In a series of open meetings, further consideration was given to the case study as a tool for scholarship, research, and academic advancement. It is intended that a broad collection of case studies will begin to alter the understanding we have of practice while assisting the most recent graduate to gain insight.

There is broad support for the case study approach within the AIA, and knowledge communities are encouraged to provide case studies for the growing database. But the format lacks sustainable design information. Seven case studies are online now, with more in review. The CED would review the case studies and then work with the Case Study Work Group to see how sustainability

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[5] See Julie A. Athman and Martha C. Monroe, *www.rbff.org/educational/BPE3.pdf*.

issues might be made a part of the framework and work to augment the framework to better capture such issues.

>*Possible partners/consultants: AIA Case Study Work Group and Society of Building Science Educators*

Conducting Postoccupancy Evaluations

This subject has been creatively pursued in the academy through Vital Signs and then Agents of Change, and through several postoccupancy evaluation courses and methodologies in architecture schools. Several educators have illustrated the power of these methods and the long-term value of their results. For the profession, this area is emerging as a new service and important area of monitoring and interpretation that has long been undervalued. Stewart Brand's *How Buildings Learn* raised design consciousness about the performance and sustainability over time. It is time to use case studies to inform iterative design improvements, design for flexibility and adaptation, and design for diverse occupancy needs.

>*Possible partners/consultants: Society of Building Science Educators and other educators*

Engaging Local COTE Chapters and the COTE Regional Team

There are 44 local and state COTE chapters and five regional team leaders. Several local and state COTEs are already actively engaged with architecture schools in their areas. The AIA Honolulu COTE collaborated with a University of Hawaii effort directed by Stephen Meder. AIA Cincinnati COTE participated in a Ball State University studio led by Robert Koester. AIA Minnesota COTE has collaborated with the University of Minnesota College of Architecture and Design (and the U.S. Green Building Council). Other local chapters have used different models of engagement. To encourage architects to incorporate ecology in the design process, the CED would sponsor programs with local COTEs to identify and document regional ecosystems, climate, locally available materials, and other factors. The results would be clearly and consistently formatted primers available to any architect.

>*Possible partners/consultants: local COTEs, U.S. Green Building Council, Forest Stewardship Council, and industry representatives*

Promoting Sustainability Demonstration Projects

Many communities have built or are planning sustainability demonstration projects, and there could be several ways that these could be linked to architecture curriculum. A review of several case studies could compare such methods and propose a model for that integration. This focus for the new CED could promote a fully funded Solar Decathlon effort for schools of architecture across the country, partnerships with community design centers for revitalizing neighborhoods, as well as climatically specific research centers at universities for students and professionals alike.

>*Possible partners/consultants: AIA Center for Communities by Design*

Ranking Architecture Schools by Levels of Ecology Literacy

The World Resources Institute has published the only ranking of business schools that includes an assessment of environmental and social impact management. Inspired by this ranking, the AIA COTE has discussed how a similar ranking system of architecture schools might be structured. For each school of architecture (offering bachelor of architecture and masters of architecture degrees), the study would assess number of required and elective courses, dedication to ecological literacy and other sustainability issues, level of interdisciplinary teaching and learning, faculty qualifications, level of green campus effort, and several other factors, each defined as a quantifiable metric (outlined in Chapter 2). This kind of ranking system could be an invaluable tool for prospective students, young educators, and others interested in this field, as well as an important benchmarking reference for institutions and departments themselves. While there are some limitations and some challenges regarding how certain indicators are calculated and (self)

reported, those could be mitigated in various ways, depending on the groups behind the ranging, with an eye toward creating an objective and fair ranking system.
Possible partners/consultants: World Resources Institute

Supporting Communication Between Professionals and Academy
In 1996, among other goals, *The Boyer Report* urged changes to create "a unified profession," noting that "The priorities for sustained action between the academy and the profession should include strengthening the educational experience of students during school, creating a more satisfying system of internship after graduation, and extending learning throughout professional life. . . . We propose that [practicing architects] be made an even greater part of classroom and studio life, and in discussions about the priorities of the curriculum itself. . . .[W]e recommend that firms regularly invite faculty and administrators to spend time in offices to exchange ideas and to help educators and practitioners keep abreast of the realities of practice and academic life."

The Educator/Practitioner Network and the EPIC Project, as well as the Case Study Initiative, are examples of AIA efforts to foster communications between professionals and the academy. The CED would make connections with these existing frameworks and identify ways to effectively contribute.

Enriching Peace Corps Activities and Ecological Design
The CED would also be a major advocate for enriching Peace Corps activities to bring climatically and culturally sustainable design solutions to emerging nations. The race to mimic the nonsustainable lifestyles and architecture of industrialized nations not only diminishes the future of those nations, it does not challenge industrialized nations to advance place-specific designs to secure their own ecological futures. There is a tremendous transformative opportunity here.

Developing Potential Partnerships
As mentioned earlier, partnerships with existing groups and initiatives will be an important part of the CED's work. The list below, which includes several organizations the AIA COTE has previously worked with, is not comprehensive; many other organizations may be deemed appropriate partners. Not all organizations mentioned here have been contacted about this report and early plans for the CED.

- American Council for an Energy Efficient Economy, *www.aceee.org/*
- American Institute of Architecture Students, *www.aias.org/*
- American Planning Association, *www.apa.org*
- American Society of Landscape Architects, *www.asla.org*
- American Solar Energy Society, *www.ases.org*
- Architectural Research Centers Consortium, *www.asu.edu/caed/arcc/*
- The Architecture Research Institute, *www.architect.org/*
- ArchVoices, *www.archvoices.org*
- Association of Collegiate Schools of Architecture, *www.acsa-arch.org/*
- Association for Community Design, *www.communitydesign.org*
- Building Owners and Managers Association International, *www.boma.org*
- Centre for Education in the Built Environment, *www.cebe.heacademy.ac.uk/*
- Civil Engineering Research Foundation, *www.cerf.org/*
- The Cloud Institute for Sustainability Education, *www.sustainabilityed.org/*
- Environmental Building News, *www.buildinggreen.com*
- The Enterprise Foundation, *www.enterprisefoundation.org*

- Federal Resources for Educational Excellence
- The Kresge Foundation, *www.kresge.org*
- International Institute for Ecological Agriculture, *www.permaculture.com/*
- International Interior Design Association, *www.iida.org*
- Mayor's Institute on City Design, *www.archfoundation.org/micd/*
- National Architectural Accrediting Board, *www.naab.org/*
- The National Building Museum, *www.nbm.org*
- National Council of Architectural Registration Boards, *www.ncarb.org*
- National Renewable Energy Laboratory, *www.nrel.gov*
- The Natural Learning Initiative, *www.naturalearning.org*
- The Natural Step, *www.naturalstep.org*
- North American Association for Environmental Education, *naaee.org/pages/index.html*
- The Permaculture Research Institute, *www.permaculture.org.au/*
- Rocky Mountain Institute, *www.rmi.org*
- Second Nature, *www.secondnature.org/*
- Smart Communities Network/DOE, *www.sustainable.doe.gov*
- Smart Growth Network, *www.smartgrowth.org*
- Smart Growth Program/EPA, *www.epa.gov/smartgrowth*
- Society of Building Science Educators, *www.sbse.org*
- Society for Campus and University Planning, *www.scup.org*
- Sustainable Building Industry Council, *www.sbicouncil.org*
- Sustainable Communities Network, *www.sustainable.org*
- Union of Concerned Scientists, *www.ucsusa.org*
- University Leaders for a Sustainable Future, *www.ulsf.org*
- Urban Land Institute, *www.uli.org*
- U.S. Department of Energy, *www.energy.gov/engine/content.do*
- U.S. Environmental Protection Agency, *www.epa.gov*
- U.S. Geological Survey, *www.usgs.gov*
- U.S. Green Building Council, *www.usgbc.org*

Partners Within the AIA
- Academy of Architecture for Health, *www.aia.org/aah*
- Center for Building Science and Performance, *www.aia.org/cbsp*
- Center for Communities by Design, *www.aia.org/liv*
- Committee on Architecture for Education, *www.aia.org/cae*
- Committee on Design, *www.aia.org/cod*
- Corporate Architects and Facility Management Committee, *www.aia.org/cafm*
- Design-Build Knowledge Community, *www.aia.org/db*
- Education/Practice/Industry Connection (EPIC) Project, *www.epiconnection.org*
- Educator/Practitioner Network, *www.aia.org/ed_epn*
- Housing Committee, *www.aia.org/housing*
- Practice Management Knowledge Community, *www.aia.org/pm*
- Public Architects Committee, *www.aia.org/pa*
- Regional and Urban Design Committee, *www.aia.org/rudc*
- Technology in Architectural Practice Knowledge Community, *www.aia.org/tap*