SUSTAINABLE PITTSBURGH

CHAMPIONS FOR SUSTAINABILITY

Champions for Sustainability
Member Workshop Summary Series

Vol. 2 No. 2
July 2009

Engineering Sustainable Solutions for Your Community: A Conference on Strategic Dimensions of Infrastructure

Workshop Date:
June 18, 2009

Champions for Sustainability (C4S)
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Executive Summary

This workshop featured experts on real-world, practical, cost-saving, sustainable solutions for infrastructure design, including energy systems, water resource technologies, buildings, and community sustainability initiatives. Businesses, engineers, architects, non-profits, and government agencies invested in our region's infrastructure from a sustainability perspective are invited to learn about the latest advancements and solutions. The event was organized collaboratively with the Environment and Water Resources Institute (EWRI), the American Society of Civil Engineers of Southwestern Pennsylvania (ASCE) and the Architectural Engineering Institute (AEI).

C4S Workshop Series

Champions for Sustainability engages its members by convening a series of events and workshops for its membership approximately six times per year. Each workshop event explores a strategic topic of interest for the membership. Events make accessible current trends and challenges, provide access to tools, knowledge, and examples, and engage the membership in assessments and reflections to help craft the regional practice of sustainability. This publication series summarizes and makes accessible the most important outcomes from these workshop events.

About C4S

Champions for Sustainability brings together companies large and small, from many different industries, entrepreneurs, community leaders, university researchers, educators, and other social ventures to put sustainability into practice. C4S aspires to be the most effective region-based collaboration of leaders accelerating the practice and policy of sustainability in business and civic circles. Champions for Sustainability provides value to firms and organizations that seek sustainable solutions to operational practices through convening, networking, and direct consulting.

Memberships and Information:

- Champions for Sustainability www.C4SPgh.org
- Sustainable Pittsburgh www.sustainablepittsburgh.org

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1 Event Summary

1.1 Agenda

Engineering Sustainable Solutions for Your Community
Date: June 18, 2009
Location: Regional Learning Alliance at Cranberry Woods
850 Cranberry Woods Drive
Cranberry Township, PA 16066
724-741-1000
Registration Information

- C4S/Sustainable Pittsburgh Members and ASCE, EWRI, AEI Members ($90.00)
- Nonmembers ($120.00)

7:30 –8:30 am ***Registration & Continental Breakfast/Introductions***
Kemal Niksic Chair EWRI Pittsburgh Section
Matt Mehalik Program Manager Sustainable Pittsburgh

Sustainable Energy Practice:

8:30 –9:00 ***Twelve Steps To Establishing The Region as an Energy Leader***
Jan Lauer, Director, 3 Rivers Clean Energy

9:00 –9:30 ***Policy Direction for a Sustainable Energy Strategy***
Patricia A. DeMarco, Ph.D.
Director, Rachel Carson Homestead
Former Commissioner, Regulatory Commission of Alaska

9:30 –10:00 ***Saving Energy: Industrial Sustainability in Action***
Chris Steffy, P.E., Industrial Energy Engineering

10:00 –10:15 ***Break***

10:15 –11:30 ***Building Green – Panel Discussion:***
Panel of experts in policy, design and implementation of sustainable building (Click name for presentation)

- Phyllis Barber, Highmark
- Patrick Onufer, Children's Hospital of Pittsburgh
- Andrew Rauch, Giant Eagle
- Aurora Sharrard, Green Building Alliance
- Catherine Sheane, Astorino (Invited)
- Raymond J. Sinagra, Civil & Environmental Consultants, Inc.

11:30 –12:30 pm ***Lunch***

Water Resources' Sustainability in Practice:

12:30 –1:15 ***Sustainability Issues in Water Distribution Systems***
Tom Walski, Ph.D., P.E., Senior Product Manager, Bentley Systems, Inc.

1:15 –1:45 ***Managing Green House Gas Emission in Wastewater Treatment Plants***
Susanne Adams, Sustainability Project Leader, Weston Solutions

1:45 –2:30 ***Green Infrastructure for Great Cities: City of Chicago Green Streets***
Janet L. Attarian, AIA, Project Director
Chicago Department of Transportation

2:30 –3:00 ***Managing Stormwater Runoff in Urban Areas: Monitoring and Performance of Pervious Pavements***
Jim Pillsbury, Hydraulic Engineer, Westmoreland County

3:00 –3:15 ***Break***

Sustainable Communities:

3:15 –3:45 ***City of Pittsburgh's Sustainable Initiatives***
Lindsay Baxter, Sustainablility Coordinator, Office of Mayor Luke Ravenstahl

3:45 –4:15 ***Sustainable Growth: Township of Cranberry Experience***
John Trant, Chief Strategic Planning Officer, Cranberry Township

4:15 –4:45 ***Q&A Session / Forum Discussion / Adjourn***

1.2 Event Summary

Engineering Sustainable Solutions for Your Community
Date: June 18, 2009
Location: Regional Learning Alliance at Cranberry Woods
850 Cranberry Woods Drive
Cranberry Township, PA 16066
724-741-1000
Registration Information

- C4S/Sustainable Pittsburgh Members and ASCE, EWRI, AEI Members ($90.00)
- Nonmembers ($120.00)

On June 18, 2009, 55 participants attended *Engineering Sustainable Solutions for Your Community: a Conference on Strategic Dimensions of Infrastructure* at the Regional Learning Alliance at Cranberry Woods. The American Society of Civil Engineers Pittsburgh Section, Environmental & Water Resources Institute, Architectural

Engineering Institute, and Champions for Sustainability (a Program of Sustainable Pittsburgh) hosted this conference, which featured experts on real-world, practical, cost-saving, sustainable solutions for infrastructure design. Conference topics included Sustainable Energy Practice, Green Building, Water Resources Sustainability in Practice, and Sustainable Communities.

The overall theme of the conference was on the increasing importance of useful knowledge in the growing field of sustainability. As the "greening" bandwagon continues to accelerate, responsible community and corporate decision makers need to look past rhetoric for realistic solutions. Engineers rose to meet these challenges and offered some of the latest practical solutions.

The Conference started by addressing energy issues. Jan Lauer (Three Rivers Clean Energy) spoke of the need to find energy solutions that address global warming, energy independence, and the growth in demand. While these challenges are significant, Lauer stated "a wealth of resources makes the region unique," including carbon dioxide storage sites, strong wind resources, ample water supply, plentiful coal and gas resources, access to the northeast corridor, etc. However, she did caution that there are concerns of a shortage of workers with the technical, skilled backgrounds necessary to implement sustainable technological solutions and stressed the need for reform to the region's vocational-technical education system.

Patricia DeMarco (Rachel Carson Homestead) followed with a talk on energy from a policy perspective. Of particular note was her focus on the demand side of the energy crisis, saying "we have made our consumption a personification of our value, our worth."

Chris Steffy (Industrial Energy Engineering) concluded the energy session by discussing how organizations can increase energy savings/efficiency through a systems-based analysis of core operations.

The energy session was followed by the Building Green Panel Discussion, which featured speakers from the Green Building Alliance, Astorino, Children's Hospital of Pittsburgh, Civil and Environmental Consultants, and Giant Eagle. The panel talked about their practical experiences with green buildings. Catherine Sheane (Astorino) discussed the importance of reinforcing green building and design with operational procedures, including evaluation and verification of costs and benefits. In reference to cost, Aurora Sharrard (Green Building Alliance) emphasized that additional costs associated with green buildings can be reduced or eliminated through an integrated design process on the front end, as opposed to adding green measures to completed plans.

Tom Walski (Bentley Systems, Inc.) began the discussion on water sustainability issues by stressing the importance of asset management in water distribution systems. This includes monitoring and tracking pipes and leaks and incorporating this information into a usable database; this is critical in efficiently organizing the maintenance of water provision infrastructure.

Susanne Adams (Weston Solutions) described her work in analyzing greenhouse gas emissions in wastewater treatment plants and how that data can be used to reduce air pollution. Finally, Jim Pillsbury gave detailed accounts of Westmoreland County's multiple permeable pavement and green roof projects that were designed to reduce stormwater runoff.

The final conference topic was Sustainable Communities. Lindsay Baxter (City of Pittsburgh) described the City's efforts to become more sustainable, including improved coordination and collaboration within the government, incorporating biodiesel fuels into the city's fleet, and research into solar energy usage.

John Trant (Cranberry Township) described local initiatives to deal with rapid growth in the community in a sustainable manner, from traffic signal coordination to activities that promote a wider range of housing choices.

To view the presenters' PowerPoint presentation slides visit the Champions for Sustainability website at http://www.c4spgh.org/pastevents.html.

2 Workshop Report Results—Participant Information

2.1 Event Attendees**:**

The following organizations had representatives attend this workshop:

3 Rivers Clean
AECOM
AECOM Water
American Society of Landscape Architects
Architectural Innovations
Astorino
Bentley Systems, inc.
Bruce Construction
Carnegie Mellon
CEC
Centria
Chester Engineers
Chicago D.O.T.
Children's Hospital
City of Pittsburgh
Civil & Environmental Consultants, Inc.
Collective Efforts, Inc.
Cranberry Township
DGI-Menard, Inc.

Dyson Airblade
Evolve EA
EWRI
FedEx Ground
Friends of the Pittsburgh Urban Forest
GAI Consultants
GAI Consultants
Gannett Fleming
Gannett Fleming, Inc.
GBA
Giant Eagle
Hatch Mott McDonald
Herbert, Rowland & Grubic, Inc
Highmark
Idea Foundry
Industrial Energy Engineering
Kent County Department of Public Works
L. Robert Kimball
Mackin Engineering Company
Mascaro Center-- Univ. of Pgh.
Michael Baker Jr., Inc.
Moon Township Municipal Authority
Port Authority of Allegheny County
Rachel Carson Homestead
SCA
Sustainable Pittsburgh
University of Pittsburgh
University of Pittsburgh
UPMC
US General Services Administration
Wayman Irvin
Westmoreland County
Weston Solutions
YMCA of Pittsburgh

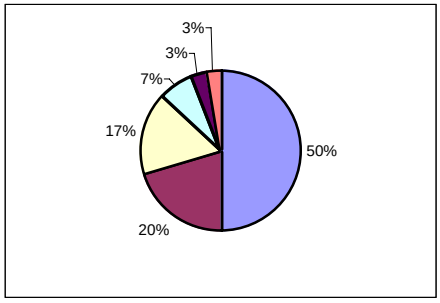
2.2 Survey Analysis[=]

44% of attendees (22/55) completed post-conference surveys.
Attendees were allowed to list multiple responses questions where applicable.

Sustainable Energy Practice
Question 1
In your opinion, what is the appropriate mix of energy sources for the region?

(Note: respondents were given a pie chart and table of the current national mix of electricity sources as a reference point; see Figure 1 below)

Figure 1: National Electricity Source Mix



Coal	50%
Nuclear	20%
Natural Gas	17%
Hydroelectric Dams	7%
Renewables (wind, solar, geothermal, biomass and wood)	3%
Other	3%

Data
Figure 2 presents the response statistics from this question. Additionally, some respondents chose to either clarify or elaborate on their responses. These responses are listed in Appendix A.

Figure 2: Survey Responses-
Preferred Regional Energy Mix for Electricity Production

[=] Especial thanks to Michael Spotts, CMU Heinz College student and Spring/Summer 2009 Sustainable Pittsburgh Intern, for the data analysis in this section.

Electricity Source	Average	Standard Deviation
Coal	25.19%	19.01%
Renewables	21.79%	17.90%
NaturalGas	18.95%	11.45%
Nuclear	17.99%	11.85%
Hydroelectric Dams	9.22%	7.95%
Other	6.62%	11.58%

Question 2
Initial: In your opinion, what is the region's most pressing priority in terms of energy?
Follow up: What are your reasons for this view?

Data
Initial: 32 responses from 22 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Answer Category	Count
Efficiency/Conservation	9
Reduction of Fossil Fuel Usage/Promotion of Renewables and Alternative Sources	8
Other	4
Improvements to Infrastructure/Grid	4
Education, Innovation, and/or Technology	3
Workforce Enhancement	2
Clean Coal and Cleaner Fossil Fuel Technology	2

Follow Up: 26 responses from 22 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Answer Category	Count
None Given	8
Concerns about Environmental Impacts	6
Local Impacts/Benefits/Concerns	3
Education, Innovation, and/or Technology	2
Efficiency/Conservation	2
Reduction of Fossil Fuel Usage/Promotion of Renewables and Alternative Sources	1
Regulations/Legislation	1
Energy Independence	1
Degree of Difficulty	1
Cost Concerns	1

Question 3
What strategy should the region pursue in meeting its energy challenges?

Data
32 responses from 17 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Answer Category	**Count**
Reduction of Fossil Fuel Usage/Promotion of Renewables and Alternative Sources	7
Education, Innovation, and/or Technology	6
Regulations/Legislation	4
Clean Coal and Cleaner Fossil Fuel Technology	3
Efficiency/Conservation	3
Incentives/Subsidies	2
Other	2
Public Relations/Awareness/Building Popular Support	2
Improvements to Infrastructure/Grid	1
Multi-Municipal/Inter-Governmental Cooperation	1
Transportation	1

Question 4
Initial: What are barriers to adoption of energy saving measures within your organization?
Follow up: What can be done to overcome those barriers?

Data
Initial: 26 responses from 20 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Answer Category	**Count**
Cost Concerns	5
Attitudes/Behavior/Motivation	5
Education, Innovation, and/or Technology	4
Regulations/Legislation	3
Other	2
None Given	2
Landlord/Tenant Issues	2
Building Structure/Design	2
Public Relations/Awareness/Building Popular Support	1

Follow Up: 23 responses from 20 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Answer Category	**Count**
None Given	8
Education, Innovation, and/or Technology	7
Incentives/Subsidies	2
Regulations/Legislation	2
Other	2
Public Relations/Awareness/Building Popular Support	1
Attitudes/Behavior/Motivation	1

Question 5
Are there any new technologies that you think are critical to achieving your organization's energy goals? If so, what are they?

Data
14 responses from 14 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Answer Category	**Count**
None Given	5
Education, Innovation, and/or Technology	4
Reduction of Fossil Fuel Usage/Promotion of Renewables and Alternative Sources	3
Landlord/Tenant Issues	1
Recycling	1

Building Green

Question 6
What new or surprising information did you learn during the "Building Green" session?

Data
18 responses from 17 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Answer Category	Count
Other	5
Number of local green buildings	4
Sustainability of presenting organizations	3
Education, innovation, and/or technology	1
Green job opportunities	1
Inefficiency of transportation	1
Motivation to change regulations	1
Retrofitting to create green buildings	1
Utilization of green building without LEED	1

Question 7
What green building activities is your organization likely to adopt in the future?

Data
25 responses from 18 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Answer Category	Count
Green building	9
Operations	4
Energy efficiency	2
None given	2
Other	2
Procurement	2
Water efficiency	2
Recycling	1
Renewable Energy	1

Question 8
Initial: What are barriers to adoption of green building activities within your organization?
Follow up: What can be done to overcome these barriers?

Data
Initial: 22 responses from 17 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Answer Category	Count
Cost Concerns	6
Education, Innovation, and/or Technology	5
Attitudes/Behavior/Motivation	3
Regulations/Legislation	3
None Given	2
Building Structure/Design	1
Landlord/Tenant Issues	1
Multi-Municipal/Inter-Governmental Cooperation	1

Data
Follow Up: 14 responses from 12 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Answer Category	Count
None Given	5
Public Relations/Awareness/Building Popular Support	3
Education, Innovation, and/or Technology	3
Workforce Enhancement	1
Other	1
Cost Concerns	1

Water Resources' Sustainability in Practice

Question 9
What new or surprising information did you learn during the "Water Resources' Sustainability in Practice" session?

Data
20 responses from 18 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Answer Category	Count
Education, Innovation, and/or Technology	7
Efficiency/Conservation	4
Other	3
Environmental impacts of treatment plants	2
Utilization of water for energy	1
Regulations/Legislation	1

None Given	1
Improvements to Infrastructure/Grid	1

Question 10
Are there new technologies that you feel are critical to addressing the region's water-related challenges? If so, what are they?

Data
20 responses from 15 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Answer Category	**Count**
Improved stormwater technology	4
Efficiency/Conservation	3
Improved water treatment technology	3
Education, Innovation, and/or Technology	2
Technology for pipe inventory/tracking	2
Attitudes/Behavior/Motivation	1
Methane reclamation from wastewater treatment plant	1
Multi-Municipal/Inter-Governmental Cooperation	1
None Given	1
Other	1
Incentives/Subsidies	1

Question 11
Initial: What are barriers to implementing the technologies and techniques presented at today's conference?
Follow up: What needs to be done to overcome those barriers?

Data
Initial: 20 responses from 18 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Answer Category	**Count**
Cost Concerns	10
Education, Innovation, and/or Technology	3
Regulations/Legislation	3
Attitudes/Behavior/Motivation	1
None Given	1
Other	1
Public Relations/Awareness/Building Popular Support	1

Data
Follow Up: 19 responses from 18 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Follow Up Category	**Count**
None Given	11
Education, Innovation, and/or Technology	4
Improvements to Infrastructure/Grid	1
Other	1
Planning	1
Regulations/Legislation	1

Sustainable Communities

Question 13
Which of the sustainability techniques presented during the "Sustainable Communities" session seem promising for implementation in you community, and for what reasons?

Data
14 responses from 11 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Answer Category	**Count**
Other	4
Planning	4
Recycling	3
Efficiency/Conservation	2
Education, Innovation, and/or Technology	1

Question 14
Initial: Which of the sustainability techniques presented in the Community Development session are not feasible in you community?
Follow Up: For what reasons are they infeasible?

Data
Initial: 6 responses from 6 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Answer Category	Count
None Given	3
Reduced Greenhouse Gas emissions	1
Hiring of Sustainability Coordinator	1
Lack of New Construction in City	1

Data
Follow Up: 6 responses from 6 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Follow Up Category	Count
None Given	5
Multi-Municipal/Inter-Governmental Cooperation	1

Question 15
What are the best practices that were not presented today that can benefit local communities?

Data
3 responses from 3 attendees;
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Answer Category	Count
Education, Innovation, and/or Technology	1
Public Relations/Awareness/Building Popular Support	1
Transportation	1

Background

Question 16
What motivated you to participate in today's event?

Data
23 Responses Listed by 19 Attendees*
Responses were grouped into the following categories (for a complete list of responses, see Appendix A):

Answer Category	Count
Content-General	12
Content-Water Resources	3
Networking	3
Technical Content	2
Content-Energy Resources	1
Content-Infrastructure	1
Presenter	1

Expectations[1]
Question 17
Initial: What expectations do you have for today's event?
Follow Up: In what ways were your expectations for today's event met or not met? For what reasons were they met or not met?

Data
17 Responses*
Percentage with expectations met: 88%
Mean expectation rating (Scale: 1-5): 4.47
Standard deviation: 0.80

*For complete list of responses, see Appendix A

[1] Survey questions that have an associated follow-up question were assigned two quantitative values during the survey result analysis:

- An "Expectation Met" binary rating, with "1" indicating the expectation was met
- An "Expectation Rating" which assesses the degree to which expectations were met on a scale of 1-5, with "1" indicating that expectations were not met at all, and "5" indicating that expectations were fully met.

Appendix A
Survey Aggregated Responses

Energy
Question
In your opinion, what is the appropriate mix of energy sources for the region?

Response	Coal	Nuclear	Natural Gas	Hydroelectric Dams	Renewables	Other	Notes
1	25.00%	25.00%	25.00%	0.00%	25.00%	0.00%	Listed "ideal" and "realistic" preferences, the later of which are listed in columns. "Ideal" is listed as Coal 10%; Nuclear 10%; Renewables 70%; and Other 10%.
2	10.00%	15.00%	25.00%	0.00%	50.00%	0.00%	
3	21.00%	20.00%	25.00%	21.00%	10.00%	3.00%	Added: “The three rivers should be a much greater source of energy, strength of our region.”
4	15.00%	25.00%	40.00%	10.00%	10.00%	0.00%	
5	5.00%	20.00%	34.00%	25.00%	12.00%	4.00%	
6	20.00%	20.00%	30.00%	10.00%	10.00%	10.00%	
7	50.00%	10.00%	20.00%	10.00%	10.00%	0.00%	
8	70.00%	5.00%	20.00%	2.50%	2.00%	0.50%	
9	10.00%	0.00%	30.00%	5.00%	50.00%	5.00%	Figures estimated based on drawn graph
10	20.00%	30.00%	20.00%	10.00%	15.00%	5.00%	
11	0.00%	0.00%	0.00%	0.00%	50.00%	50.00%	"Other" specifically listed as "Conservation and Efficiency"
12	48.00%	10.00%	10.00%	7.00%	10.00%	15.00%	
13	24.75%	24.75%	8.91%	7.92%	24.75%	8.91%	"Other" specifically listed as "unknown technologies"
14	35.00%	20.00%	20.00%	5.00%	10.00%	5.00%	
15	30.00%	10.00%	20.00%	7.00%	30.00%	3.00%	Added: “Of course shifts over time to reduce fossil fuels. Perhaps increase other to include fuels we haven't even [illegible]”
16	0.00%	50.00%	0.00%	10.00%	20.00%	20.00%	
17	40.00%	20.00%	20.00%	7.00%	10.00%	3.00%	
18	40.00%	20.00%	25.00%	5.00%	10.00%	0.00%	
19	40.00%	30.00%	6.00%	12.00%	12.00%	0.00%	
20	0.00%	5.00%	0.00%	30.00%	65.00%	0.00%	Figures estimated based on drawn graph

Question
Initial: In your opinion, what is the region's most pressing priority in terms of energy?
Follow up: What are your reasons for this view?

Response	Follow Up
Push and rush to "Clean Coal" technology.	I am concerned that although this state/region is "rich" in coal, the environmental (AMD, lost streams, undermined properties), is a long-term cost lost in our "Rush" to "Partial" solution.
Lack of innovation, too much regulation inhibits growth in existing resources, and lack of workforce	NONE PROVIDED
Making greater efficient use of the rivers as a resource for electricity	Local resource that is renewable
#1 conservation now! Reducing coal to reduce particulates in air quality; distributed energy production and upgrade the grid	Conservation, reduce particulates in air quality
Clean coal technology, coal gasification, and natural gas use with low environmental impacts (ie, clean/re-use FRAC water)	Reasons are available resources, jobs, while maintain environment
Reducing reliance on coal and natural gas/fossil fuels	Reason- reduce reliance on dwindling resources that cause global warming
Reducing waste and consumption (especially through education) so that we can reduce further strip mining/extraction. Rather have 100% renewable, decentralized but not feasible for long, long time	…so that we can reduce further strip mining/extraction…
Source	Because of possible regulations on coal companies
1-Making alternatives to coal and natural gas available; 2-Being prepared in terms of providing a qualified workforce for green jobs	1- cost prohibitive, not enough awareness and education among building owners, facilities, residential
Increasing efficiencies in energy use and production (i.e., lower carbon dioxide)	NONE PROVIDED
Education	Education of potential workforce, education of decision makers, education of community would all lead to an increase in energy independency and decrease in environmental impact
Waste/loss - Old infrastructure	NONE PROVIDED
Efficiency!	Older building stock and infrastructure (including the distribution grid) means there's great potential to meet increasing demand with less energy generation
Releasing all reliance on fossil fuels.	They are a nonrenewable resource we are

Response	Follow Up
	abusing more and more each year
Need to find cost and technology effective clean coal to reduce emissions	Coal is not going away, a huge local resource and economic driver.
Increasing renewable energy sources and balancing with more efficient use of existing natural resources	NONE PROVIDED
Energy conservation	Most important and easiest to fix. I can't think of one industry or facility type that is not a big energy loser
Crumbling grid	NONE PROVIDED
Reducing demand, supplementing coal, bringing more renewables to market	NONE PROVIDED
Grid technology	We need to be able to efficiently and effectively distribute the energy
Dependence on nonrenewable resources	NONE PROVIDED
Simultaneously increasing renewables, decreasing coal usage and promoting technologies that create energy efficiencies. They have to happen together	NONE PROVIDED

Question
What strategy should the region pursue in meeting its energy challenges?

Response
The need for clean, well-designed and "renewable" energy should be evaluated and implemented as truly demonstrated within the region to not just "work" but consider cost for generation, final waste reuse, and "voids" left behind.
Conservation, renewable, innovative design opportunities
State and local regs need to give incentives to change
Utilize existing resources (coal, gas) to extent possible. Should legislate clean technologies
Improve planning and sustainable development to reduce reliance on fossil fuels. More regional, inter-governmental planning
At state/federal: give subsidies to renewables over coal/fossil fuels and help those residents who need financial help to pay; changing costs; subsidize decentralized power collection, mandate energy audits
-Reduce use; -Increase alternative energy sources
Fund research and development programs
Update infrastructure
Public awareness, energy industry reform and political support
Clean coal, additional use of nuclear and renewables, and, as or more important, means of energy conservation; better transportation systems
Marcellus shale – gas

Response
Education and marketing the energy conservation opportunity
There need to be consortia of large electricity buyers that can work collectively and use buying power to finance new wind and deep geothermal projects
Look to our political leadership and universities to collaborate on a [sic] effective plan
Water turbines in rivers, wind turbines on top of buildings, solar panels on big box stores
Promote and fund clean tech

Question
Initial: What are barriers to adoption of energy saving measures within your organization?
Follow up: What can be done to overcome those barriers?

Response	Follow Up
Being a for-profit business with office space within an approximately 100 year old building - primary barrier for efficiency improvements within building dependent on property owners financial impact (lack of incentives)	
Collective buy-in, potential up front costs	better education is needed to all end users of resources
Cost and the technology that meets our operations demand	Develop economic models that balances the benefits with operational demand
Indecision as to what direction to take next; economic downturn-funding	
No impetus; no knowledge (eg, leave pc's on 24/7)	Education, corporate policies
Lack of knowledge or motivation	Implementation of "cheerleader" to spearhead effort
Building is already not up to code-can't do new tech because not in code, but those parts that are updated only get to current regulations, not new technologies	
-Common areas shared with other organizations, i.e. bathrooms; -1 light switch for large area	-Introduce policy to all organizations with common area usage; -Break up zones with their own light switch
Existing HVAC system and design of building	
The status quo	Overcome with education
	Barriers may be worn or torn down with education
Legacy structures - rather than new buildings	
Funding for upfront costs.	Grants help. If I could get approval to use other funding mechanisms, such as ESCOs, I could take on more projects
There really aren't any	
Education; Buy in from management and staff	
Politics, old codes and resistance to change	Education and less rigid codes and standards
Bottom line effects, status quo mind-states, unwillingness to change behavior	Provide employee incentive; recognize, not belittle those who make extra effort
Safety regulations	Research into alternative safety controls

Response	Follow Up
Changing behaviors	Making information available helps educate and influence behavior
Easy access to reliable info and guidance about implementation	

Question

Are there any new technologies that you think are critical to achieving your organization's energy goals? If so, what are they?

Response
Wind power and natural gas
No
New…not really; solar-thermal; heat recovery; geo-thermal
None come to mind
-Individual desk lamps as opposed to overhead lamps; -Sensor lights
Real-time monitoring of energy use
Not that I know of
Turn off computers, etc. - much of this is left on for backup/updating…could something shut this off in a more timely fashion?
No, just improving on current technology.
As a design consultant all new technologies are interesting in the expanding energy field
Improved modeling of alternative energy sources and conservation methods
More recycling of materials
Model green lease- need to upgrade building lighting, but little incentive to do so without help from landlord
Occupancy sensors and other technologies along these lines that override human habits

Building Green

Question

What new or surprising information did you learn during the "Building Green" session?

Response
-That design professionals and entities such as Highmark, GE, and Childrens look beyond the "LEED" label and implement what makes sense, or makes the environment more comfortable for its end user/patron; -Also, I believe that a huge component of the atmosphere should not stop at the door, i.e. outside "site counts and compliments."
How sustainable Giant Eagle is.
Didn't think about the green jobs opportunities

Response
Not new, but number of facilities going green but not LEED
The work companies such as Giant Eagle are already doing on sustainable development
PA third in nation
Green roof doubles life of roof
-That out of 2+ million square feet of LEED certified buildings, the convention center represents 1.5 million; -The number of firsts in terms of LEED buildings
The ability to convert existing buildings to green or sustainable structures
1- Pitt's stature nationwide; 2- Grants available to help
Children's is a green building
There is still a lot more education needed to all and facts/data gathering to substantiate people to build green
Advocates for sustainable development are making some progress with zoning codes, regulatory agency buy-in but developers still run into bureaucratic attitude with agency staff. (Health Dept., PWSA)
How inefficient transportation is
Architects are good showmen
Giant Eagle designs better buildings after learning from the LEED application process
That emergency generators can be used to provide off-the-grid energy

Question
What green building activities is your organization likely to adopt in the future?

Response
-Looking at green roof, rain water infiltration options on-site; -Renewable building improvements, products, supplies
Sustainable design, construction, and operations of portfolio. Striving/goal is LEED certification
Already incorporation many
LEED EB
Enhanced recycling
More efficient lighting
Weatherization, PV and solar thermal
CLT retrofitting whole building
Documentation of policy in terms of green products used and green building principles in terms of renovation and new construction
Green water/wastewater infrastructure related practices
Maintenance, materials
Considering EBOM-like retrofits and changes to operation, although we may not pursue actual certification
Determined green construction, likely with the intent of LEEDs certification

Response
Building management and operations, recycling.
We design LEED and beyond buildings and land development. We will adopt improved modeling and processes
Carbon mapping
We are committed to continuing our sustainable practices
Sample pilot project of green roof plants

Question
Initial: What are barriers to adoption of green building activities within your organization?
Follow up: What can be done to overcome these barriers?

Response	Follow Up
We often experience that state, local, municipal, city, county, and authority "regulatory" codes and regulations often conflict and limit incorporation of green approach, thinking, actions	Our role remains to push the agenda, incorporate discussion opportunities with actual projects and tracked results
All end users need to to cooperate/have buy in	Continued reinforcement of the importance, better education, tie in sustainability to job performance
Customer not educated	Available funds for projects
Lack of knowledge/importance	
Cost	More awareness of cost-benefit savings of green construction
City government: Changing present codes-restricted by what exists; also perceived/actual costs; understaffed and underfunded; slow speed of bureaucracy	Need highly skilled people and ability to hire
	Continue to emphasis long-term thing over short-term budgets
Education	
Old buildings still functional; disinformed [sic] decision-making	
Typically financial only	
Education, cost perception	
	Need to focus green building techniques and their cost/benefits on the developer/owner community. They are the "decision makers." Design professional need better hard data (reliable) to "sell" their clients on building green.
Resistance to change	Education
Money	
Regulations from local, state, and federal organizations	
Cost of water-proofing roof	
We rent	

Water Resources' Sustainability in Practice

Question

What new or surprising information did you learn during the "Water Resources' Sustainability in Practice" session?

Response
Stormwater as a resource!! This should be Western PA's pride
The amount of water lost in distribution systems from leakage. The amount of water resource loss also impacts the amount of electricity that is used or lost
Factors to consider when planning for an emergency water storage and distribution system
(Tom) interesting talk about water infrastructure and energy from water pumping. Lots of opportunity for improved efficiency
Consideration of greenhouse gas emission in wastewater treatment plants
Number of different porous pavement technologies tested by Westmoreland Co.
Ease/effectiveness of the data analysis for leakages in system; UK DMAs
UK ahead of US in water monitoring; PA tax assessment according to permeable surface
I enjoyed learning the basis of water distribution systems - did not realize that there was so much water lost in leakage
Potential carbon dioxide limits for wastewater treatment plants
It was all new for me! I'm glad to hear the technologies are there to help
I didn't know that VFDs are more appropriate for flat acres
The haphazardous [sic] ways some water systems currently are. Multiple types of pervious pavements
Amount of work yet to be done
Very good presentation on stormwater BMP's
Energy consumption of water systems infrastructure
Great majority of the information was new and very informative
Pipe leaks can be mapped using microstation CAD

Question

Are there new technologies that you feel are critical to addressing the region's water-related challenges? If so, what are they?

Response
I feel that water treatment needs to consider the massive load left "untreated" from the pharmaceuticals and hormones "flushed" into the public water supply
Better use of stormwater, more use of BMP, more efficient and reliable distribution systems
Unknown
Graywater systems; stormwater management technology
Not new, but water reuse should be emphasized
Porous pavement, rain gardens, and green roofs key to addressing region's water-related

Response
challenges
Storm water reduction- all technologies related due to combined sewer system
Addressing water leaks, pressure planning
"Green" stormwater technologies and practices
The only water related technologies that currently concern me are those of water purification
No, need to do the surveys and assessments needed and implement/upgrade current technologies
GIS with asset management built in. Wastewater treatment plant methane reclamation systems with low concentration turbines and hydro-thermal extraction; Regionalization of wastewater treatment; Permeable Pavement- quick and less expensive method of improvement
Conservation!! Tax credits to promote infiltration
Maybe if there are any new technologies that strengthen riparian zones
Cities and municipalities could use the microstation program to inventory leaking pipes

Question

Initial: What are barriers to implementing the technologies and techniques presented at today's conference?
Follow up: What needs to be done to overcome those barriers?

Response	Follow Up
Regulatory conflicts within our municipal regulations, state regs and concern that many local municipal boards "have done it this way for 100 years…why change!"	
Up front cost, life cycle concerns, maintenance costs	
System size, cost, value of application	
Funding and regulations	
Economics	Requires reasonable regulation
Cost	Education needed
Cost	Educating all stakeholders involved to make sure a sustainable choice is not "undone"
Initial cost of permeable concrete, pavers, etc. may be higher than traditional if not considered with the entire life-cycle	
Getting municipalities and contractors to learn about and implement these techniques and technologies	
Again education	
It sounds like the problems are (1) will and (2) putting in the best of what's already available - [illegible] that technology, except GIS is critical.	
	Major overhaul of existing water systems. Research into more stable and practical pervious pavements.
Money	
Updated codes and regulations- regulatory agencies not up to date with sustainable practices	

Politics, cost	Education and long-range planning
Getting leadership on board	Mostly cost analysis of the projects, which were effectively addressed
Cost of training municipal employees to use the program	

Sustainable Communities

Question

Which of the sustainability techniques presented during the "Sustainable Communities" session seem promising for implementation in you community, and for what reasons?

Response
Recycling, lighting, stormwater - really implementable
Traffic light LED replacement; -Single stream recycling
Sustainability department to coordinate and collaborate with departments to reduce overlap and find gaps
Implementing bottom up, top down approach
The TND- I think the holistic view that the TND utilize is very good for community growth
Glad to hear the city is pushing recycling
I live in Pittsburgh, so!
Impressed by Cranberry's huge show
It is not just a technique it is putting together an overall sustainability strategy and plans
Planning is the big issue
All techniques seem to be appropriate for implementation within my community

Question

Initial: Which of the sustainability techniques presented in the Community Development session are not feasible in you community?
Follow Up: For what reasons are they infeasible?

Response	Follow Up
Significant greenhouse gas reductions	
Full-time sustainability coordinator	Not feasible for small communities; regional resources needed
City has less new construction, and more renovation focused context	
See above, this is decided in strategy sessions. It is not just a technique it is putting together an overall sustainability strategy and plans	
None	
None, they actually seem to be under more restrictions than my community	

Question
What are the best practices that were not presented today that can benefit local communities?

Response
Individual/residential participation
Public transportation options
Education

Background

Question

What motivated you to participate in today's event?

Response
Sustainability topic w/diverse speakers
Implemented a Green Initiative and want to learn as much as possible with respect to sustainability
Program activity-related projects
Learn about stormwater management; network; learn about federal stimulus opportunities for projects
Interest in topic, involvement, and business opportunities
Interest in sustainable solutions
Applied information and examples that went beyond information covered in other recent workshops I have attended on sustainability
Topic, exactly what I wanted to learn more about specifically energy and water issues
Water resources issues
Personal and professional development
Interest in infrastructure; looking for needs from education
Networking
Interest in the topic
To become more informed in all aspects of sustainable development and its impact on our communities
Topics covered
Speaking
Good combination of theoretical and technical information
Relevant design topics and speakers, networking opportunities
The opportunity to find out how new technologies are being applied to sustainability

Expectations

Question

Initial: What expectations do you have for today's event?

Follow Up: In what ways were your expectations for today's event met or not met? For what reasons were they met or not met?

Response	FollowUp	Expectation Met	Expectation Rating
I hoped for practical experience with examples of lessons learned- good, bad, and design approaches	Yes. Thanks	1	5
A variety of experts in sustainable fields and walk away more knowlegeable	Yes, my expectations were met	1	5
	Yes	1	5
Excellent workshop! Great facility!	Yes, Thank you.	1	5
Variety of topics to be addressed	Yes, my only disappointment was throw away plastic ware, plates, cuts at continental breakfast	1	4
Ideas to take back	Yes	1	5
	Yes, except that I wish Ms. Attarian could have spoken about the green alley. Would have been applicable to potential project under discussion. Could you please follow up with info when she will be coming out, as mentioned before?; Water session dragged on too slowly	1	4
As a non-engineer, I was afraid the info. Would be too technical, but it was extremely interesting, varied, and practical		1	5
To learn about overall sustainable issues (my specialty is water)	Yes- my expectations were met	1	5
	Expectations were exceeded	1	5
	It was very engineer/technical-focused, which I did not expect. I expected more "advocacy" stuff. That was a surprise but I learned a lot. Also, I expected some structured interaction, but it was OK without.	1	3
Somehow expected more students.	Would suggest advertising. Other than that all expectations met	1	4
Learn and meet people	Yes	1	5
Well rounded, diverse presentations	Met my expectations	1	5
Broader exposure to sustainability	Yes	1	5
	I think the cards as a way to collect questions is terrible. This small room should be easy to allow audience engagement and discussion. People like to ask questions directly and interact with speakers	0	3
The facility should be served by public transit		0	3

Survey questions that have an associated follow-up question were assigned two quantitative values during the survey result analysis:

- An “Expectation Met” binary rating, with “1” indicating the expectation was met
- An “Expectation Rating” which assesses the degree to which expectations were met on a scale of 1-5, with “1” indicating that expectations were not met at all, and “5” indicating that expectations were fully met.

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