



Mastering Campus Energy and Water Management – Tools for Success

August 8, 2016

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Administrative Notes

- Logistics:
 - No tables, which means there will be times we will be asking for your help in re-arranging the room for different activities
 - Lunch is on your own
- To be eligible for continuing education units (CEUs) for this workshop, you must
 - Sign in and sign out
 - Complete a participant evaluation and take the quiz for this workshop. Access this workshop's participant evaluation and quiz using this link:
<http://www.wbdg.org/education/femplt08082016b.php>
- Handouts and slides will be available at the FEMP Large Campus Innovative Change Initiative (LCIC) website:
<http://energy.gov/eere/femp/large-campus-innovative-change-initiative>

Agenda

9:00-9:30am	Introductions
9:30-10:30am	Addressing the Challenges: How to be a “Super Energy Manager”
10:30-10:45	Break
10:45-noon	Culture Change Game
Noon-1pm	Lunch (on your own)
1:00-2:00pm	Project Financing: One size does not fit all
2:00-3:45pm	Speed Dating: Meet some resources <ul style="list-style-type: none">» Guiding Principles [Nic Baker, FEMP]» Metering [Saralyn Bunch, FEMP]» Energy Security/Resiliency [Caroline Harrover, PNNL]» EISA Assessments [Emily Wendell, PNNL]» Water Management [Kate McMordie-Stoughton, PNNL]» Climate Resilience Planning [Kathleen Judd, PNNL]
3:45-4:30pm	Large Campus Innovative Change Resources

Speed Dating

- What do we mean by “Speed Dating”?
- Need questions for each topic area
 - Guiding Principles [Nic Baker, FEMP]
 - Metering [Saralyn Bunch, FEMP]
 - Energy Security/Resiliency [Caroline Harrover, PNNL]
 - EISA Assessments [Emily Wendell, PNNL]
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Sustainable Federal Buildings 2016 Guiding Principles

- Executive Order 13693 section 3(h)(ii) states that agencies will identify “... a percentage of **at least 15 percent, by number or total square footage,**” of their “existing buildings **above 5,000 gross square feet (GSF) that will, by fiscal year 2025, comply with the revised Guiding Principles for Federal Leadership in... Sustainable Buildings (Guiding Principles)... and making annual progress toward 100 percent conformance with the Guiding Principles for its building inventory.**”
- The 2016 Guiding Principles for Sustainable Federal Buildings updates and replaces the December 2008 Guiding Principles to:
 1. Reflect the evolution of sustainable building design, construction, and operating practices since 2008,
 2. Incorporate other building-related E.O. 13693 requirements,
 3. Increase the economic and environmental benefits of Federal investments in facilities,
 4. Enhance occupant health, wellness, and productivity,
 5. Include climate resilience in building design, construction, and operations, and protect Federal facilities investments from the potential impacts of climate change, and
 6. Provide information on tracking agency green building performance.

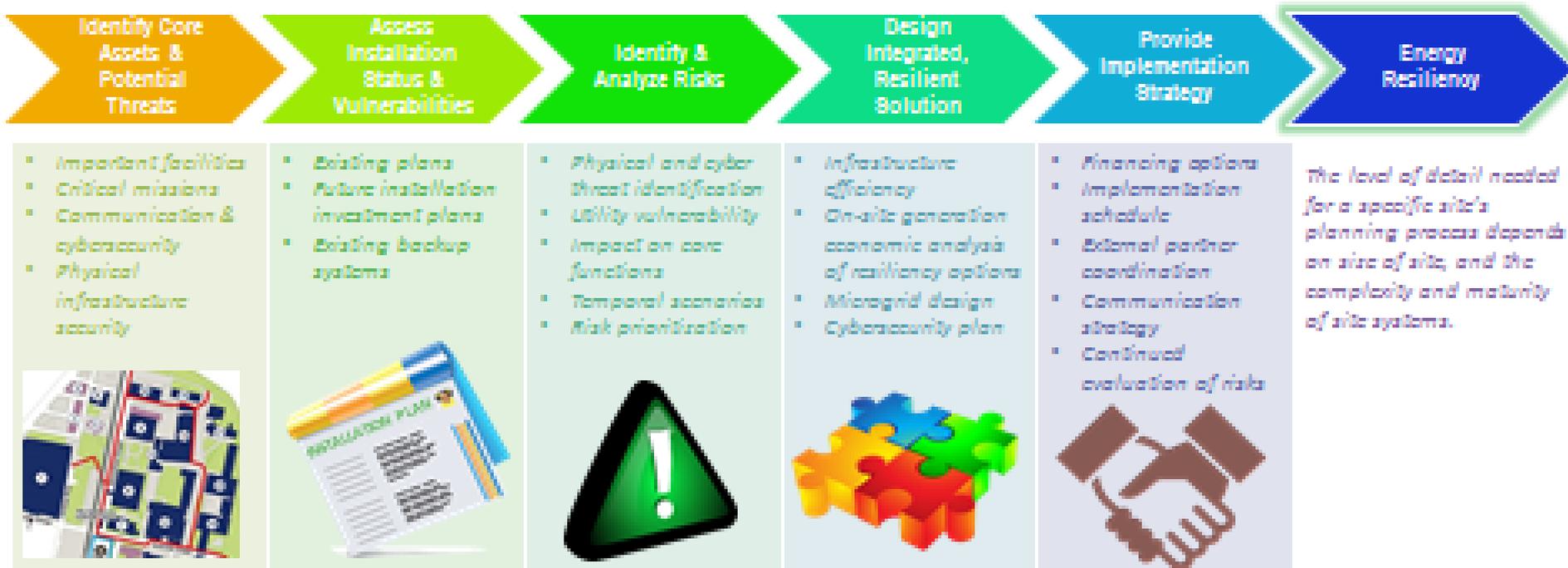
FEMP Sustainability Project Manager: Nic Baker

Email: Nicolas.Baker@hq.doe.gov Phone: 202-586-8215

- Metering is required for electricity, natural gas, steam, and water consumption per
 - Energy Policy Act of 2005
 - National Energy Conservation Policy Act Section 543, as amended (42 U.S.C. § 8253)
 - Executive Order 13693, Planning for Federal Sustainability in the Next Decade
- Federal Building Metering Guidance issued November 2014 stated the purpose of metering Federal buildings is to collect, analyze, and act on the energy performance data
 - Hourly data is minimum interval to be collected
 - Data must be incorporated into a data management system
 - Data must be provided to the energy manager
- The Guidance provides a two-step process for installation of meters in Federal buildings:
 - Step 1 sets criteria for determining Federal buildings for which the installation of meters is “appropriate.”
 - Step 2 recommends a methodology for establishing a prioritization process for the installation of meters at all “appropriate” Federal buildings

Energy Security/Resiliency

- ▶ Energy Security is “having assured access to reliable supplies of energy and the ability to protect and deliver sufficient energy to meet mission essential requirements” - FY2012, National Defense Authorization Act (NDAA)
- ▶ Resiliency is “the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions” - E.O. 13653
- ▶ Key elements of Energy Security/Resiliency Planning



EISA Assessments



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EISA 2007 Sec 432: Evaluate 75% of energy consuming buildings every 4 years. Perform “Comprehensive Energy and Water Evaluations” and Retro-commissioning Assessment

3 Types of Assessments

Walk Through

Remote

Desk

Scope of Analysis

ASHRAE Level 1/2 & Commissioning Assessment

Subset of Level 1 & Commissioning Assessment

Facility Status Eval
Utility Analysis
ECM List Review

Assessment Type Criteria

Operating Status

Facility Characteristics

Utility Profile

Project Implementation Status

EISA Assessment programs can be tailored for each agency to meet a number of mandates and goals:

- Identify and develop Net Zero buildings or sites, State & Federal water and energy reduction mandates, alternative financing goals, etc.

Comprehensive Energy and Water Evaluation Contact: Emily Wendel

Email: Emily.Wendel@pnnl.gov

Phone: (206) 528-3011

Facility Water Cycle



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Climate Resilience Planning Framework

Climate Exposures

- Past / Current
- Future

Vulnerability of Systems & Infrastructure

- Sensitivity
- Adaptive capacity

Impacts

Significance for Mission & Operations

- Mission attainment
- Operating/maintenance costs
- System reliability
- Safety

Adaptation Plans

- Reinforce existing measures
- Identify new measures
- Integrate into operations
- Monitor change

Climate Resilience Planning:
Kathleen Judd
Email:
Kathleen.Judd@pnnl.gov
Phone: (206) 528-3330

Previously Identified Issues

- Develop a useful campus energy/water/sustainability plan that provides clarity on where the focus should be
- Address the conflict between near and long goals
- Need solutions to address the bandwidth limitations (time, funding)
- Address how focus a campus program given limited access to data
- Need tips on how to overcome the low cost of energy and water and the first cost of energy and water investments
- Emphasize a campus approach rather than an agency or individual building approach

Previously Identified Technical Areas of Interest

- **Energy Security/Resiliency**
- **Energy and Water Assessments**
- Energy Efficiency
- Energy Conservation
- **Energy and Water Metering and Data Management**
- Environmental Management Systems
- Reduce Greenhouse Gases
- **Climate Adaptation and Resiliency Planning**
- Electric Cars & Charging (Fleet & Personal vehicles)
- **HPSB Guiding Principles for new and existing buildings**
- **Reducing Water use**
- Connection between Water and Energy use
- **Financial incentives**
- Pollution Prevention/Environmentally Preferable Purchasing
- ESPCs/UESCs

Feedback

- What do you consider the greatest issues at your campus inhibiting your ability to meet your energy/water/sustainability goals?
- What areas would you like to be provided FEMP technical assistance?
- What is working well at your campus?



Ten Steps to a “Super” Energy Program

1. Build a network
2. Use data
3. Set goals
4. Develop plan
5. Find funding
6. Communicate
7. Engage your network
8. Take action
9. Measure and verify progress
10. Recognize and reward accomplishments

Build a Network

- Identify key stakeholders at your campus and broaden your internal network to include unusual suspects
 - Contracting
 - Information Technology/Cybersecurity
 - Mission
 - Human Resources
 - Building occupants
 - Management/Leadership
- Build an external network
 - Peers
 - Community members
 - Technical service providers

Avengers image

Use Data

- Use energy and water data, where available, to
 - Benchmark performance
 - Assess usage trends
 - Identify opportunities for improvement
 - Track progress
 - Verify energy and water savings
- Look first where data exist
- Where data do not exist, use other means for documenting progress and develop plans to get the data in the future
- Develop a data management system

Matrix image

Set Goals

- Keep the number of goals small
- Long-term goals can be aspirational
- Near-term goals should be attainable and measurable
- Consider identifying potential “Quick Wins” to get buy-in from new stakeholders
- Work to imbed the goals into existing business systems

Hawkeye image

Develop Plan

- Connect energy, water, waste, and sustainability strategies whenever feasible
- Assign stakeholders to be accountable for different aspects of the plan
- Develop a clear plan of action and tasks
- Have a clear focal point and expected outcomes that can be communicated to others
- Develop schedule that includes regular progress checks with the stakeholders

Elephant superhero

Strategy vs. Strategery

- **Strategy** is a plan of action designed to achieve a particular goal
- **Strategery** is a reactive, quickly developed ‘plan’ of action passed off as strategy.

<http://www.bing.com/videos/search?q=SNL+strategery&view=detail&mid=EDECA9699022352A961EEDECA9699022352A961E&FORM=VIRE>

- If the ‘strategy’ meeting you’re holding was called ten minutes ago it’s a strategery meeting
- If you’re developing the plan at midnight on your 10th cup of strong coffee, it’s probably strategery
- If three participants in the meeting are dialing in separately by phone to discuss it, it’s strategery
- If the ‘strategic plan’ needs to be implemented at 9am tomorrow morning and completed by 10am it’s a strategeric plan
- If you’re writing it on a plane, train or the back of a car, it’s strategery

<http://www.forbes.com/sites/dansimon/2012/09/11/5-differences-between-strategy-and-strategery/#63eab1b12af8>

Find Funding

- Pursue funding from within the agency
- Use other people's money, when possible
- Look for low-/no-cost strategies that could be part of the Quick Wins
- Quantify the cost of delay if the plan is not fully implemented
- Use your extended network to look for new funding sources

Ironman image

Communicate

- Make senior leadership aware of the plan, and if possible get them to commit to the goals and participate
- Look at the plan and goals monthly to assess progress and help focus efforts
- Share the plan with internal and external stakeholders
- Engage campus occupants through competitions or general communications
- Track and share progress on goals

Deadpool image

Engage your Network

- Use your web of contacts to identify potential funding sources
- Offer training to key stakeholders and your internal and external network
- Engage the campus occupants to be part of the effort
- Be persistent about engaging more than the usual suspects
- Continue to expand your network

Spiderman image

Take Action

- Pick one thing to focus on
- Use technology to your advantage
- Automate where logical
- Offer training resources for all key stakeholders
- Fix the basics
- Include a focus on quality maintenance
- Hold competitions

Captain America image

Measure and Verify Progress

- Develop a measurement and verification plan that is logical for the existing level of data
- Collect and analyze available data on a regular basis
- Use the data to further improve performance and to communicate successes with key stakeholders
- Continuous monitoring and assessment is preferred, where technical and human resources are available

Cyborg image

Recognize and Reward Accomplishments

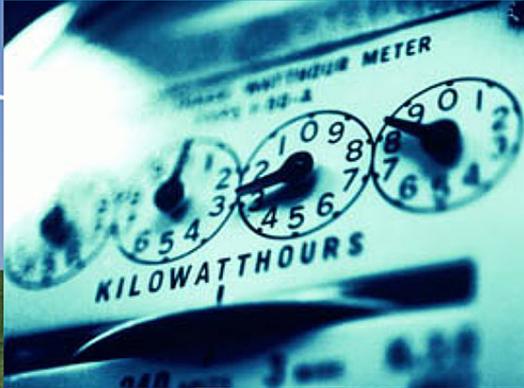
- Publicly recognize or reward stakeholders and others that are actively reducing energy, waste or waste
 - Recognition in internal newsletters
 - Small token rewards such as food, pins, cloth bags, etc.
 - Submission into Federal awards program
 - Notes in their annual performance review
- Recognize key internal and external stakeholders whenever possible

Superman emblem image

Planning Worksheet

- What are the major goals that you are working toward? Are there any new ideas you want to pursue?
 - Make a list of goals and/or ideas
 - Identify key stakeholders that will need to be involved

GOALS/IDEAS	STAKEHOLDERS	STRATEGY



Culture Change Activity

Return by 10:45 AM

The adoption of an innovation in a social system follows a **predictable pattern**:



It starts with a **small group**, even a **single person** who has an idea that is new to the system.

It spreads *slowly* at first through the work of change agents who **actively** promote it.



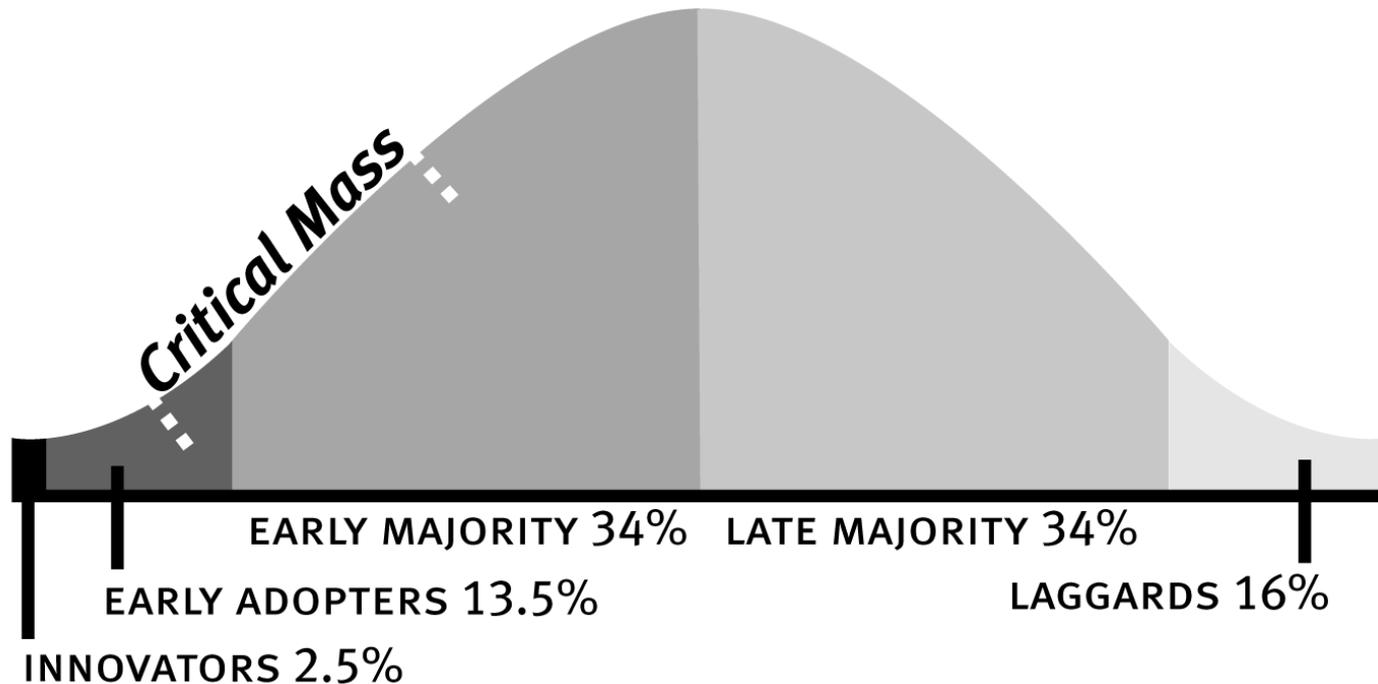
As more change agents and transformers adopt the innovation and *communicate* it to others, more early adopters join the process until the idea reaches critical mass and “takes-off.”

Stages of Adoption

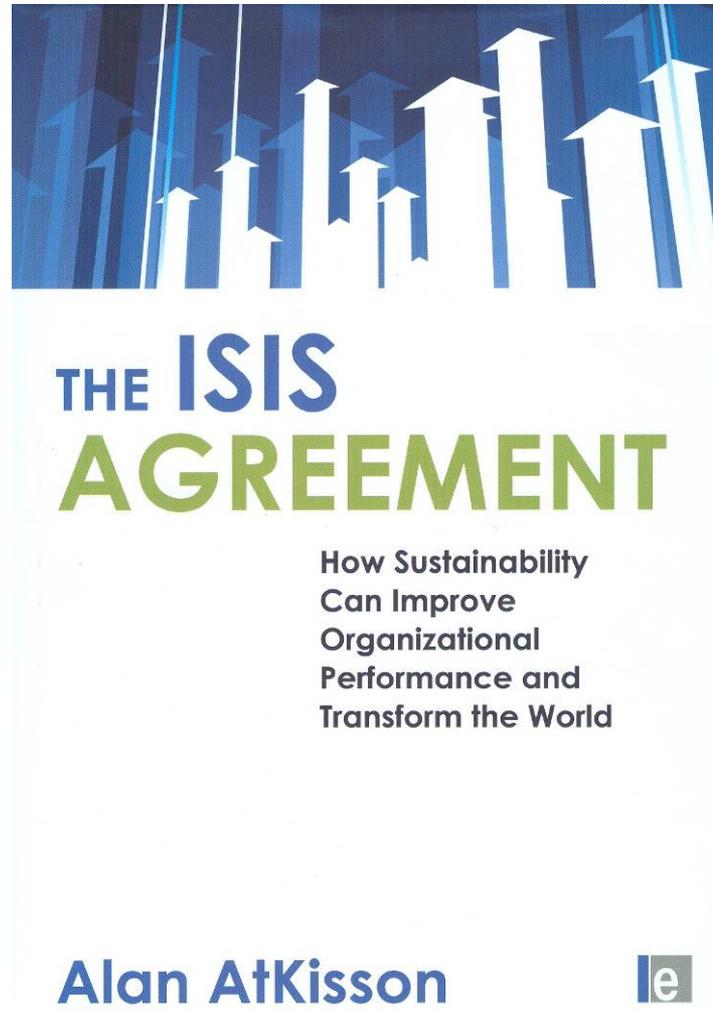
Rate of Adoption of an Innovation Over Time

Figure 3.2

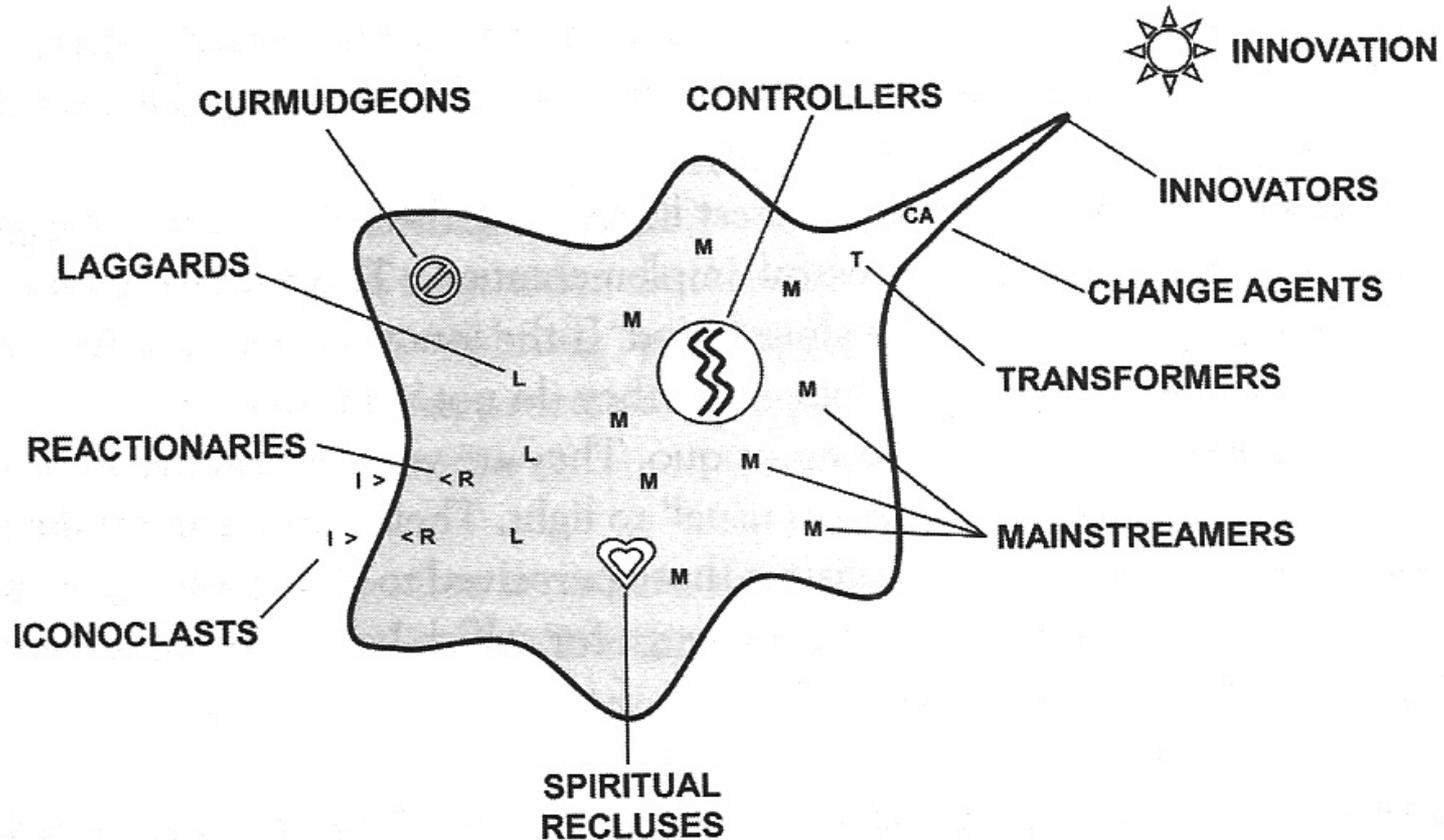
Source: Adopter Categorization on the Basis of Innovativeness
Adapted from: Rogers, 1995, pg. 262



Cultural Change Game



Learning from the Amoeba



The ISIS Agreement: How Sustainability Can Improve Organizational Performance and Transform the World (Figure 8.5, page 181) By Alan AtKisson (2008, ISBN: 978-1-84407-415-0)

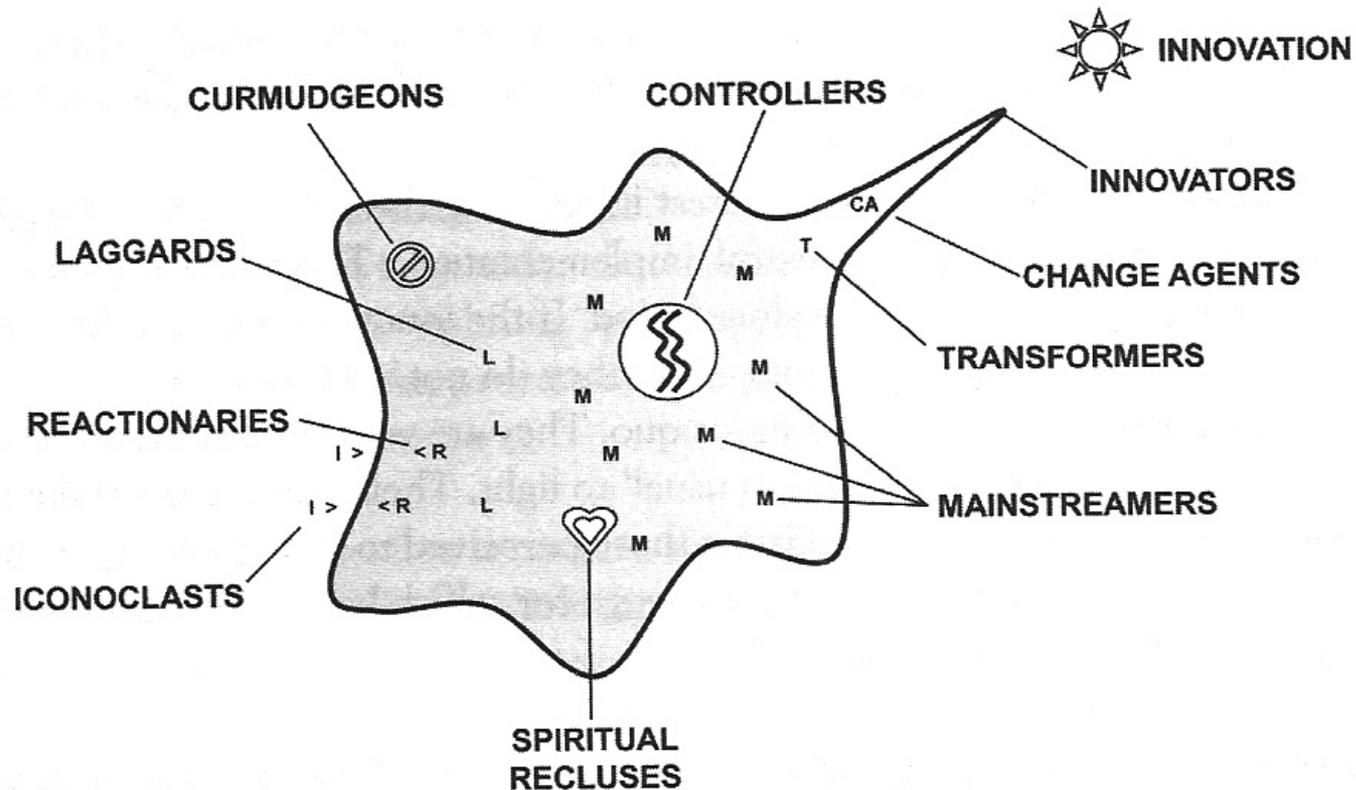
Amoeba Game

- The “Very Prepared Site” has initiated its Energy Security planning effort. The Sustainability Manager is the assigned lead for the Energy Security Plan and he/she is eager to build a team and get started with the planning effort. The site has 100 buildings and related infrastructure that needs to be considered for the Energy Security Plan. The Plan needs to ensure that the site’s key missions will be functioning during a grid outage of up to 30 days.
- The Sustainability Manager has called together the first meeting of potential stakeholders to discuss the goals of the Energy Security Plan, to identify additional stakeholders, and to define next steps. Each participant needs to do the following:
 - **Read your card to yourself and behave as the character represented on the card**
 - **Introduce yourself to everyone in your group (“My name is [your name]. I am the [title on your card].”)**
 - **The Sustainability Manager runs the meeting. He/She initiates the discussion by describing the goals of the Energy Security Plan and soliciting feedback**
 - **Meeting participants voice their opinions (and the Sustainability Manager responds as deemed appropriate)**

Feedback on Experience

- How much progress did you make?
- What challenges did you encounter?
- Have you encountered a situation similar to this in real life?

Who was playing?



The ISIS Agreement: How Sustainability Can Improve Organizational Performance and Transform the World (Figure 8.5, page 181) By Alan Atkisson (2008, ISBN: 978-1-84407-415-0)

Influence Strategies

- Innovator
 - Express respect and appreciation
 - Learn important parts of their ideas
- Change agent
 - Use to produce a brochure, report or website
 - Test ideas and collaboration opportunities
- Transformer
 - Busy, but interested, so need the elevator speech
 - Listen carefully to their priorities
- Controller
 - Treat them as ‘super-transformers’
 - Have a clear action-focused message ready
 - Stress benefits of idea
 - Don’t waste time with chit chat
 - Avoid nervous laughter
- Curmudgeon
 - Energy drain that are best to avoid
 - Look for opportunities rehabilitate

Influence Strategies, continued

- Reactionary
 - Avoid or engage Iconoclasts to distract them
 - Recruit as Transformers, if they must be engaged
- Laggard
 - Avoid and keep away from Reactionaries
- Iconoclast
 - Give them information to support your cause
 - Publicly keep your distance
- Spiritual Recluse
 - Use when they can support your goals
- Mainstreamer
 - Approach after Transformer buy-in

Amoeba Game, Round 2

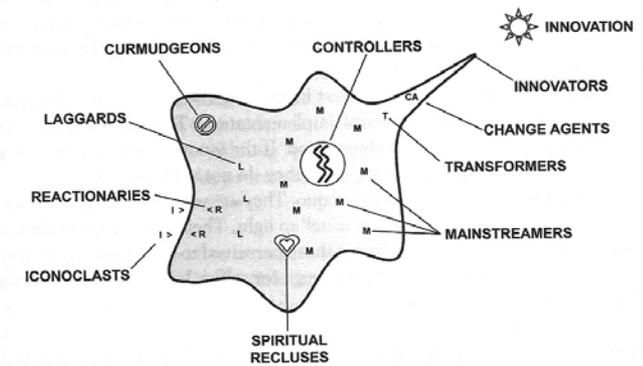
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- The Sustainability Manager has called together the first meeting of potential stakeholders to discuss the goals of the Energy Security Plan, to identify additional stakeholders, and to define next steps. Each participant needs to do the following:
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 - **The Sustainability Manager runs the meeting. He/She initiates the discussion by describing the goals of the Energy Security Plan and soliciting feedback**
 - **Meeting participants voice their opinions (and the Sustainability Manager responds as deemed appropriate)**

Feedback on Experience

- How much progress did you make?
- What challenges did you encounter?
- Pull out your Planning Worksheet:
 - Who else would you engage?
 - What strategies would you take with the key players?

Remember the AMOEBA

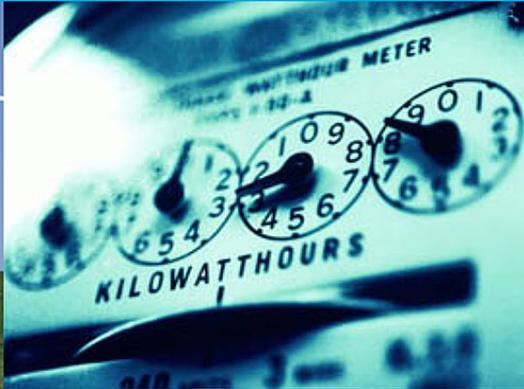
- A = Adapt the Innovation
- M = Mobilize the Change Agents
- O = Organize the Transformers
- E = Easy does it for the Mainstreamers
- B = Build momentum at the margins
- A = Avoid Reactionaries, Laggards, and Curmudgeons



The ISIS Agreement: How Sustainability Can Improve Organizational Performance and Transform the World By Alan Atkisson (2008, ISBN: 978-1-84407-415-0)

Additional Thoughts – *My personal favorites*

- Walk the Talk
 - Without the experience of wrestling with changes yourself, it is difficult to advise others on how to make a large-scale change
- Use up-to-date information
 - Have current information when you talk with your peers
 - Encourage your peers to be technical leads and to recommend strategies
- Share information and credit
 - Create a cooperative environment
 - Nominate peers in different organizations for energy and environmental awards



Lunch

Please return at 12:55 PM

Speed Dating

- Break up into 6 groups
- At each location introduce yourself to the Subject Matter Expert (SME) and give them your business card
 - Name, title, agency, location
- Questions provided before lunch will be answered by the SMEs
- Rotate to the next location when told
- Answers to these questions will be posted on the FEMP LCIC webpage:

<http://energy.gov/eere/femp/large-campus-innovative-change-initiative>



Energy Exchange Sessions

Energy Exchange Agenda at a Glance: Tracks 1-7

Energy Exchange Welcome Monday, August 8 8:00-7:00 pm • Exhibit Hall

Energy Exchange 2016	Track	TRACK 1 Energy 101	TRACK 2 Energy Technology	TRACK 3 Project Financing	TRACK 4 Energy Resilience	TRACK 5 Energy Resilience for Critical Facilities	TRACK 6 Energy Building Energy Management	TRACK 7 Energy and Leadership	TRACK 8 Policy and Leadership
Day	Time	Room 101	Room 102	Room 103	Room 104	Room 105	Room 106	Room 107	Room 108
TUESDAY	8:30 am - 10:30 am	1	Foundation Building Block	Energy Technology Programs	Maximizing Your Project: A Guide to Energy Financing	Energy Resilience Policy	Lighting Technologies and Controls	Counting a Building's Carbon Footprint	Building Principles 2016: Policy and Leadership
	10:30 am - 12:00 pm	2	EMAC 101	Advances to Resilient and Storage	Benefits of ESPC	Partnering with Utilities for Energy Resilience	EMCO to EPCO: Building Performance Cook	Building Success and Learning from Failure	Energy Efficiency Energy Leadership
	12:00 pm - 1:30 pm	3	Policy, Design, and Lighting	Advanced Auditing Tools	Perspectives on Resilience Management	Working Together for Green Energy Resilience	EM and Energy Management Integration	Outstanding Case Study: From 2008 LEED Gold to 2014 LEED Platinum	Outstanding Case Study: From 2008 LEED Gold to 2014 LEED Platinum
WEDNESDAY	8:30 am - 10:30 am	4	State of Building and Benchmarking	Phase Change Materials for Building Envelope	Advanced Topics in Measurement and Verification for ESPC	Cheremsky and the Grid	Why Do-It-Yourself Commissioned? Case Study on Energy Resilience	Developing your Plan: Making it all Happen	New Concepts in Climate Resilience Planning and Implementation
	10:30 am - 12:00 pm	5	EM and Commissioning	The Impact of Design-Builder-Owner-Operator (DBO) Efficiency and Savings	Contracting Options: Perspectives	Cheremsky for Contracting: From Design-Build to Design-Build-Operate	Integrated Building Performance	Counting Smart and Smart (and More)	Sustainability: Connecting and Measuring Low-Carbon Performance Data
	12:00 pm - 1:30 pm	6	Building Controls and Automation	EMAC Technologies	Risk and Resilience	Resilience in Action: Recent Projects	State Center Energy Management: Integrating A Facility's Resilience & Energy	Learning by Doing: Why Failure is an Option and How We Learn from Our Mistakes	Legal Challenges Facing Energy Programs
THURSDAY	8:30 am - 10:30 am	7	Life Cycle Costing	Building Automation and Operation Tools	Case Studies	Workshops for Resilience	EM Strategies: A Buck for Buckler?	Learning from People Like You	Climate Agency Roundtable
	10:30 am - 12:00 pm	8	Third Party Financing	Special Challenges of Energy Technology	EM Performance and Life Cycle Costing	Regional Resilience Planning: A Life Cycle Costing	Technology Roundtable: What's Next in Energy Management	Resilience and Leadership: A Case Study	Resilience in Action: Recent Projects
	12:00 pm - 1:30 pm	9	Tools and Resources for Resilience Center	Advanced Controls and Energy Management	Connecting the Dots: EM, Resilience, Leadership, and Awards	Enabling Technologies for Energy Resilience	Resilience Roundtable: What's Next in Energy Management	Building for the Future: Smart Building Design	EM 2016 Roundtable

AG 1: Operating Resilience: What's Next for the Grid. August 7-8, 2016. Subject to change.

- Session 1
 - Track 7: Guiding Principles 2016
 - Track 10: Campus Approach to Energy Management
- Session 2
 - Track 3: Benefits of an ESPC
 - Track 10: Components of a Successful Master Planning
 - Track 12: Campus Utility Distribution System Strategies
- Session 3
 - Track 2: Advanced Auditing Tools
 - Track 10: Integrating Sustainability and Net Zero into Installation Master Planning
- Session 4
 - Track 7: New Concepts in Climate Resilience Planning and Implementation
 - Track 11: Metering Strategies: Opportunity Identification Using Energy Data

Energy Exchange Sessions

Energy Exchange Agenda at a Glance: Tracks 1-7

Monday, August 8
8:00-7:00 pm • Exhibit Hall

Energy Exchange 2016	TRACK	TRACK 1 Energy Mgt	TRACK 2 Energy Technology	TRACK 3 Project Financing	TRACK 4 Energy Resilience Policy	TRACK 5 Energy Resilience	TRACK 6 Energy Efficiency	TRACK 7 Policy and Leadership
Day	Time	Session	Session	Session	Session	Session	Session	Session
MONDAY	8:00 am - 7:00 pm	1	Federal Building Stock 1	Federal Technology Program	Regulating Your Project: A Case Study in Energy Resilience	Energy Resilience Policy	Lighting Technologies and Controls	Building Practices 2016: Best in Class Leadership
TUESDAY	8:00 am - 7:00 pm	2	INAC 101	Advances in Resilience and Storage	Benefits of ESPC	Aligning with Utilities for Energy Resilience	ES&S to LEED: Building Performance Code	Leadership Transition: A Path to Success
TUESDAY	8:00 am - 7:00 pm	3	POWER, WATER, and LIGHTING	Advanced Building Tech	Perspectives on Resilience Assessments	Energy Resilience: From Theory to Practice	ES&S and Energy Management Integration	Delivering the New Year: How to Get it Right with Your Organization, Staff, and Tools
TUESDAY	8:00 am - 7:00 pm	4	Buildings Auditing and Benchmarking	Using Change Material for Building Energy	Advanced Topics in Assessment and Verification for ESPC	Community and the Grid	Why On-Site Generation? Cost and Its Role in Energy Resilience	Developing your Plan: Taking Small Steps
WEDNESDAY	8:00 am - 7:00 pm	5	TEAM and Commissioning	The Impact of Design on Energy Efficiency and Savings	Commissioning for Energy Efficiency: A Case Study	Integrated Building Performance	Energy Resilience: A Path to Success	Sustainability: Integrating it into Your Business
WEDNESDAY	8:00 am - 7:00 pm	6	Building Controls and Automation	AVAC Technologies	Risks and Rewards	Resilience in Public Buildings	State Center Energy Management: From Theory to Practice	Learning by Doing: Why It Matters and How to Get It Right
WEDNESDAY	8:00 am - 7:00 pm	7	Life Cycle Costing	Building Automation and Operation Tools	Case Studies	Resilience for Resilience	DRR Strategies: A Path to Success	Learning from People Like You
THURSDAY	8:00 am - 7:00 pm	8	Third Party Financing Options	Special Challenges of International Operations	Performance Contracting: A Case Study	Resilience for Resilience: A Path to Success	Technology in Small, Mid-Sized Buildings	Pharmacy and Healthcare: A Path to Success
THURSDAY	8:00 am - 7:00 pm	9	Tools and Resources: Your Building Center	Advanced Building and Energy Controls	Control the User: ESPC, Property, Liability, and Assets	Building Technologies for Energy Resilience	Working from Marketing to DRG	Building to Win: Working Smart, Working Hard

- Session 5
 - Track 6: Capturing Hearts and Minds (and More)
 - Track 8: Alternative Water: Sources, Uses, & Case Studies
- Session 6
 - Track 1: Building Controls and Automation
 - Track 8: Tracking Federal Energy and Water Performance
 - Track 10: What Can We Learn from Higher Ed?
 - Track 13: Maximizing FEMP’s Customer Services
- Session 7
 - Track 4: Microgrids for Resiliency
 - Track 8: Engaging your Entire Organization to Affect Change
 - Track 10: Integrating Renewable Energy on a Federal Campus/Large Installation
 - Track 11: Integrating Multiple Projects
 - Track 13: Incorporating Renewable Energy into Performance Contracts

Energy Exchange Sessions

- Session 8
 - Track 4: Regional Resiliency Planning in the Federal Sector
 - Track 7: Perspectives in Sustainability
 - Track 8: A Conversation with the Federal Chief Sustainability Officer
- Session 9
 - Track 3: Closing the Deal: ESPC Proposals, Evaluations, and Awards
 - Track 4: Enabling Technologies for Energy Resilience
 - Track 8: Approaching Net Zero Water, Energy and Waste
 - Track 11: Long-term Energy Efficiency: It Takes a Village

Energy Exchange Agenda at a Glance: Tracks 1-7

Energy Exchange Welcome
Monday August 8
5:00-7:00 pm • Exhibit Hall

Energy Exchange 2018	TRACK	TRACK 1 Energy 101	TRACK 2 Energy Technology	TRACK 3 Project Financing	TRACK 4 Energy Resilience or Energy Resilience	TRACK 5 Better Building Energy Management	TRACK 6 People Matters Institutional Change in Buildings	TRACK 7 Policy and Leadership
DAY	TIME	SESSION	Room 551	Room 5	Room 6	Room 7	Room 8	Room 9
Opening Heavy Items (Subject to Change)								
TUESDAY	10:00 am - 10:30 am	1	Foundation Building Block 1	Federal Technology Programs	Matching Your Project to a Contracting Vehicle: UNABLE, ESPC, PMA, UEC	Energy Resilience: Policy	Lighting Technologies and Controls	Charting a Path to Success: Contract Matters
	10:30 am - 11:00 am	2	HVAC 101	Advances to Renewables and Storage	Benefits of ESPC	Participating with Utilities for Energy Resilience	BESES to SEED: Building Performance Tools	Building Systems and Learning the Lessons to Enhance Your Success
	11:00 am - 11:30 am	3	Meters, Drivers, and Lighting	Advanced Auditing Tools	Perspectives on Financing Arrangements	Working Together to Advance Energy Resilience: Energy and Mission Assurance	BAS and Energy Management Integration Technologies	Defining Success and Learning the Lessons to Enhance Your Success
	11:30 am - 12:00 pm	4	Basics of Auditing and Benchmarking	Phase Change Material for Building Envelopes	Advanced Topics in Measurement: ESPC	Cybersecurity and the Grid	Why On-going Commissioning Can Lead to Better Performing Buildings	Defining Success and Learning the Lessons to Enhance Your Success
WEDNESDAY	10:00 am - 10:30 am	5	CBM and Commissioning	The Internet of Things: Building Greater Efficiency and Savings	Contracting Officers Perspective	Cybersecurity for Critical Systems: Federal Facilities/Installations	Integrated Building Performance	Capturing Insights and Making Them Work
	10:30 am - 11:00 am	6	Building Controls and Automation	HVAC Technologies	Tools and Resources	Resilience to Action: Recent Projects	Data Center Energy Management: Innovation Approaches to "Quantity as a Quality"	Legal Challenges Facing Energy Programs
	11:00 am - 11:30 am	7	Life Cycle Costing	Building Automation and Operation Tools	Case Studies	Microgrids for Resilience	CBM Strategies: A Back to Basics	Learning from People Like You
THURSDAY	8:00 am - 8:30 am	8	Third Party Financing Options	Rapid Deployment of Innovative Technologies	Performance Contracting for Smaller Sites	Regional Resiliency Planning for the Federal	Technology & Cost: Not What it Used to Be	Measuring and Evaluating Success: What Works?
	8:30 am - 9:00 am	9	Tools and Resources: Your Knowledge Center	Advanced Lighting and Lighting Controls Technologies	Closing the Deal: ESPC Proposals, Evaluations, and Awards	Enabling Technologies for Energy Resilience	Moving from Marketing to EPC	"Baking it In": Working Toward Lasting Change

Closing Heavy Items (Subject to Change)

1. A/CET continuing education units are NOT available for this track. Version: 7/22/2018 (Subject to change)

Feedback

- What do you consider the greatest issues at your campus inhibiting your ability to meet your energy/water/sustainability goals?
- What areas would you like to be provided FEMP technical assistance?
- What is working well at your campus?



Regional Sustainability Workshops

- FEMP will be providing Regional Sustainability Workshops in 2017
 - Hosted at GSA locations
 - Free to all Federal agencies
- Workshops will cover sustainable building and campus level strategies and practices addressing some of the regional priorities identified by agencies
- To express interest, contact:
 - Nic Baker; Nicolas.Baker@EE.Doe.Gov

FEMP Resources

- FEMP website: <http://www.energy.gov/eere/femp/federal-energy-management-program>
- LCIC website: <http://energy.gov/eere/femp/large-campus-innovative-change-initiative>
- FEMP Training website: <http://www.energy.gov/eere/femp/federal-energy-management-program-training>
- Water Resources:
 - FEMP EO 13693 Water Provisions: <http://energy.gov/eere/femp/guidance-meeting-executive-order-13693-water-provisions>
 - FEMP Water Efficiency Best Management Practice: <http://energy.gov/eere/femp/best-management-practices-water-efficiency>
 - FEMP Water Project Screening Tool: <http://energy.gov/eere/femp/downloads/water-project-screening-tool>
 - FEMP Alternative Water Mapping Tool: <http://energy.gov/eere/femp/alternative-water-sources-maps>

FEMP Resources

- Metering Resources

- Federal Building Metering Guidance, November 2014 Update: http://energy.gov/sites/prod/files/2014/11/f19/metering_guidance.pdf
- Metering Best Practices: A Guide to Achieving Utility Resource Efficiency, Release 3.0: <http://energy.gov/eere/femp/downloads/metering-best-practices-guide-achieving-utility-resource-efficiency>
- De Minimis Thresholds for Federal Building Metering Appropriateness, March 2015: http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-24175.pdf
- Federal Metering Data Analysis Needs and Existing Tools, July 2015: http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-24191.pdf
- Simplified Data Processing Method for Meter Data Analysis, November 2015 (http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-24331.pdf)
- Prioritizing Building Water Meter Applications <http://energy.gov/eere/femp/prioritizing-building-water-meter-applications>
- Estimating Methods for Determining End-Use Water Consumption <http://energy.gov/eere/femp/estimating-methods-determining-end-use-water-consumption>

Reminder

- To be eligible for continuing education units (CEUs) for this workshop, you must
 - Sign in and sign out
 - Complete a participant evaluation and take the quiz for this workshop. Access this workshop's participant evaluation and quiz using this link:
<http://www.wbdg.org/education/femplt08082016b.php>
- Handouts and slides will be available at the FEMP Large Campus Innovative Change Initiative (LCIC) website:
<http://energy.gov/eere/femp/large-campus-innovative-change-initiative>
- Contacts:
 - Kim Fowler, kim.fowler@pnnl.gov, (509) 372-4233
 - Elena Meehan, elena.meehan@csra.com, (865) 278-3003
 - Jesse Maestas, jesse.maestas@verusrm.com, (303) 396-5819