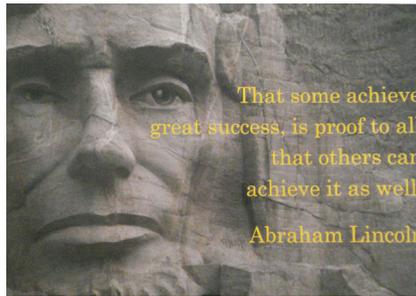




# REPORT OF THE TOWARDS ZERO NET ENERGY RETROFITS CHARRETTE

SEPTEMBER 13, 2013



HOSTED BY

Division of Capital Asset Management and Maintenance



**PROJECT #DCP1207ADI**  
FINAL DATED JANUARY 30, 2014

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## EXECUTIVE SUMMARY

In December 2011, the Accelerated Energy Program (AEP) was established to accelerate the implementation of energy and water savings projects across the Commonwealth and help the Commonwealth comply with Executive Order 484. The AEP is a three year program that aims to reduce energy consumption by 20-25% over 700 state sites, creating about 4,000 clean energy jobs and saving the Commonwealth an estimated \$43 million annually.

At the half-way point of the AEP, Division of Capital Asset Management and Maintenance (DCAMM) concluded additional work was needed to achieve a reduction in annual energy consumption of 25%. Current efforts were only producing an estimated 22% reduction.

DCAMM and the Department of Energy Resources (DOER) decided that a new and innovative approach would be required on select sites to achieve deep energy savings. The AEP leveraged the recommendations provided by the Massachusetts Zero Net Energy Task Force in 2009 to launch a new Towards Zero Net Energy (TZNE) Retrofit approach. TZNE was defined as an approach to retrofitting facilities that, at a minimum, achieved deeper energy retrofits (40% or more) and also strove for zero net energy through the installation of renewable energy systems.



Left: Deputy Director Jenna Ide listened to suggested changes and provided immediate approval of all changes that could be implemented. Right: Jeremy Caron, of DCAMM, stands in front of one of many posters with inspirational quotes from Albert Einstein, Abraham Lincoln, Thomas Edison and others displayed on the walls to motivate participants.

On September 13, 2013 the AEP management team hosted a facilitated 4-hour charrette to bring together 74 attendees from the DCAMM, DOER, client agencies and consultants to identify how to implement TZNE Retrofits on DCAMM energy projects.

This integrated team documented seven (7) best practices from experience on prior TZNE projects, as follows:

1. Assign the right team
2. Define TZNE tools and align with existing conditions
3. Get buy-in at all levels
4. Establish integrated processes
5. Incorporate innovative solutions
6. Time retrofits with deferred maintenance
7. Manage post-project operations

The team also defined actions required to implement TZNE retrofits on DCAMM projects going forward. Actions were labeled as “just do it” or those that would require a longer time to implement.

## BACKGROUND

### WHAT IS THE AEP?

The Commonwealth of Massachusetts manages more than 80 million square feet of buildings at hundreds of sites which annually consume more than 1 billion kilowatt hours of electricity, 22 million gallons of heating oil, and 46 million therms of natural gas, and create 1.1 million tons of greenhouse gas emissions per year.

The AEP was launched in December 2011 to accelerate the implementation of energy and water projects across the Commonwealth and help meet the goals of Executive Order 484. As part of the AEP, DCAMM, in coordination with the DOER and partner state agencies, will retrofit 700 sites encompassing thousands of buildings throughout the Commonwealth.

The AEP is a three-year initiative that will create sustainable job opportunities across the Commonwealth and save approximately \$43 million annually through the conservation of energy and water. The AEP will be executed in conjunction with other energy conservation and facility management initiatives across the Commonwealth and will provide access and opportunities for small, minority, and women-owned businesses.

The goals of the three-year AEP include:

- To expand the energy program to upgrade every site over three years while meeting long-term E.O. 484 targets.
- To communicate effectively with employees and the public in order to inform and encourage participation in the AEP.
- To help ensure that the Commonwealth maintains its top national energy efficiency ranking (as cited by the American Council for an Energy Efficient Economy) through implementation of innovative and economical energy solutions.
- To employ continuous commissioning (a process that involves facility staff in regular review of equipment performance and calibration) to improve facility operation & maintenance.
- To create sustainable job opportunities across the Commonwealth.

### WHAT IS “TOWARDS ZERO NET ENERGY”?

As defined by the U.S. Department of Energy (DOE), a zero net energy (ZNE) building is a building with zero net energy consumption and zero carbon emissions annually. Buildings that produce a surplus of energy over the year may be called “energy-plus buildings” and buildings that consume slightly more energy than they produce are called “near-zero energy buildings” or “ultra-low energy buildings”.

DOE cited in the *Annual Energy Review 2006* that traditional buildings consume 40% of the total fossil fuel energy in the US and European Union and are significant contributors of greenhouse gases. The zero net energy consumption principle is viewed as a means to reduce carbon emissions and reduce dependence on fossil fuels.

In 2009, the Massachusetts Zero Net Energy Buildings Task Force published a report, “Getting to Zero”. The Report provides important information and recommendations from the Task Force (spearheaded by DOER) to guide the team’s thinking on Zero Net Energy Buildings.

The guiding principle was based on the Massachusetts ZNEB Task Force’s conclusion that, “even by 2030, achieving the zero net energy performance goal may be infeasible for some buildings, but the broader objective should be to reduce energy loads to the minimum practical level, produce on-site as much as the required energy as reasonable from renewable resources, and purchase locally generated renewable energy to satisfy remaining needs.” (Page 1)

### Getting to Zero

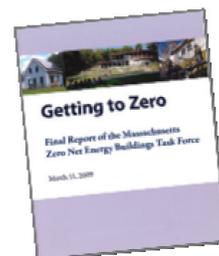
<http://www.mass.gov/eea/docs/eea/press/publications/zneb-taskforce-report.pdf>

In 2012, the Rocky Mountain Institute published the *Managing Deep Energy Retrofits Guide*, which provides an implementation framework for achieving deep energy retrofits that includes detailed process guidance for design and retrofit teams. These guidelines offer clarity to organizations such as DCAMM and DOER in regard to how to structure new and innovative approaches to achieve deep energy retrofits.

### RMI Managing Deep Energy Retrofits

[http://www.rmi.org/Content/Files/RetroFit\\_Depot\\_Managing\\_Guide\\_1.1.pdf](http://www.rmi.org/Content/Files/RetroFit_Depot_Managing_Guide_1.1.pdf)

The Massachusetts’s *Getting to Zero Report* and the RMI’ *Managing Deep Energy Retrofits Guide* were provided to all participants prior to the Charrette.



## WHY ARE WE PURSUING TZNE RETROFITS ON AEP SITES?

In the summer of 2013, which marked the half-way point of the AEP, DCAMM assessed the progress to date and concluded that more work was needed to achieve 25% reduction in annual energy consumption. Current efforts were only producing an estimated 22% reduction.

DCAMM and DOER decided that a new and innovative approach would be required on select sites to achieve deep energy savings. The AEP leveraged the recommendations provided by the Massachusetts Zero Net Energy Task Force in 2009, to launch a new Towards Zero Net Energy (TZNE) Retrofit approach. TZNE was defined as an approach to retrofitting facilities that, at a minimum, achieved deeper energy retrofits (40% or more) and also strove for zero net energy through the installation of renewable energy systems.

*THE THREE GREAT ESSENTIALS TO ACHIEVE ANYTHING WORTHWHILE ARE: HARD WORK, STICK-TO-ITVENESS, AND COMMON SENSE.*

– THOMAS A. EDISON

One of many inspirational quotes posted at the charrette to motivate participants to think about how to achieve TZNE.

## AEP TZNE RETROFITS CHARRETTE

### WHAT IS A CHARRETTE?

A charrette is an intense collaborative workshop in which a group of people draft solutions to a problem.

While the structure of a charrette varies, depending on the problem and the individuals in the group, charrettes often take place in multiple sessions in which the group divides into sub-groups. Each sub-group then presents its work to the full group as a “report-out of material for further dialogue.

Charrettes serve as a way of quickly generating a draft solution by facilitating the integration of the knowledge and interests of a diverse group of people.

### WHAT WERE THE GOALS OF THE AEP TZNE CHARRETTE?

TZNE was defined as an approach to retrofitting facilities that, at a minimum, achieved deeper energy retrofits (40% or more) and also strove for zero net energy through the installation of renewable energy systems.

As such, the AEP held the TZNE charrette with the goal to bring together people who were actively working on DCAMM projects from DCAMM, DOER, client agencies and consultants and identify how to implement TZNE Retrofits on DCAMM energy projects to achieve deeper savings. It was believed that an integrated team would be required to make substantive changes to the existing DCAMM delivery process to achieve deep energy savings through a TZNE retrofit approach.

The AEP TZNE Charrette was structured to leverage the expertise of all participants by documenting best practices from prior TZNE projects and then defining specific actions required on DCAMM projects going forward.

### TZNE BEST PRACTICES

AEP TZNE Charrette participants were divided into break-out groups to brainstorm and document the specific practices that they used on prior similar projects that resulted in the successful implementation of zero net energy projects.

Each of the six break-out groups then reported out their findings. All 74 participants then integrated the report-outs from each break out group into a summarized list of seven key practices, as follows:

## 1. ASSIGN THE RIGHT TEAM (RIGHT TEAM AND RIGHT SIZE)



Eric Friedman, of DOER, along with a team of attendees discuss the importance of engaging the right people with the required expertise into all phases of the project.

The importance of engaging the right people with the required expertise into all phases of the project cannot be overstated.

Implementing towards zero net energy retrofits is nearly impossible without the right team. Assigning the right team with the right size enables a project team to streamline processes, manage all aspects of the project under one umbrella and achieve better communication and greater savings.

The right team includes planners, architects, mechanical engineers, civil engineers, design lighting engineers, daylighting experts, renewable technology experts, other building system designers, and experts in commissioning and operations and maintenance (O&M).

A key point was made that, when working on the right team within an integrated team environment, no one person knows as much as the team of experts combined.

It is important to get all of the right people together early in the process to receive as much input as possible before decisions are made.

It is also critical that the team have an expert that is well trained on the complexities of renewable technologies. Although including such experts can increase upfront costs, it also ensures that the most cost-effective and high performing systems are appropriately selected, designed, and installed – specific to each unique set of site conditions.

## 2. DEFINE ZNE GOALS AND ALIGN WITH EXISTING CONDITIONS

Energy efficiency and renewable energy goals need to be included upfront as a key element that the facility design must meet. Teams need to define the energy saving goals or specific energy budgets for a site as part of the initial planning effort. These goals should then be aligned with the actual energy consumption of the site based on existing conditions documented in the audit.

Prior ZNE teams were able to define the total technical potential of a site in regard to energy savings and determine what level of investment is feasible based on the goal and existing conditions.

### 3. GET BUY-IN AT ALL LEVELS



Ian Finlayson, of the Executive Office of Energy and Environmental Affairs (EOEEA), and Tony Ransom, of DCAMM, discuss the challenges in getting stakeholders and other departments buy-in for TZNE projects along with a team of attendees.

Project teams face challenges in getting stakeholders' and other departments' buy-in for TZNE projects.

While it is important to demonstrate financial savings, it is equally as important to engage with the right decision-makers early in the process and then communicate regularly. For example, community colleges typically have sustainability teams and faculty whose mission is to enhance the reputation of the college and integrate sustainability into the curriculum. Including these people into the process helps the community college gain additional benefits from the energy project as well as build buy-in at all levels.

Project teams who carefully think about how to communicate with and engage influential managers, their staff and facility management team – and then get them all on board – are most successful. Most critical is developing a stakeholder management plan that define and link the benefits of energy efficiency and renewable energy investments to the operating organization's mission, operating plan and desire for maintaining safe working conditions.

The important issue is to start by understanding what the operating organization's interests are so that project teams can promote energy efficiency projects as helping them to achieve their own business objectives.

Some typical roadblocks are high upfront capital costs, uncertainty of saving and perceived risks, budgets that do not prioritize energy efficiency and lack of time or personnel to design and implement the projects because of other, higher priorities.

Prior projects were successful when the project team developed a project plan based on a detailed site assessment and engagement with stakeholders, built a business case that included the agency's mission and then put together a proposal for approval.

### 4. ESTABLISH INTEGRATED PROCESSES

Participants agree that utilizing integrated processes and collaborative methodologies are paramount to project teams tasked with achieving toward zero net energy goals.

All members of the project team and building stakeholders need to examine the project objectives, building materials, systems, and assemblies from many different perspectives. This approach differs from the typical planning and design process, which relies on the expertise of specialists who work in a degree of isolation from each other in their respective specialties.

Integrated processes employ whole systems thinking and is always collaborative in assessing how one system affects all others. For example, improving envelope insulation and adjusting air flow requirements can often greatly reduce the HVAC system requirements and save considerable money.

These integrated processes are needed to complete the various documents used throughout the project life cycle such as Whole Building Assessments, Master Plans and Basis of Design.

The entire team needs to participate in the process to understand how one system affects all others to achieve the benefits of integrated design. This process requires more time up front, but brings a payoff by allowing a faster process once the project gets to the construction document phases because problems and solutions are identified in the earlier design phases.

It was agreed by participants that owners have to stipulate up-front that its selected design team conduct an integrated planning and design process.

## 5. INCORPORATE INNOVATIVE SOLUTIONS

The majority of buildings in use today suffer from thermal comfort, lighting, and energy performance issues.

Each site and building has unique set of site and building conditions that need to be taken into consideration to cost effectively address these deficiencies and implement deep energy retrofits with renewable energy solutions.

Better solutions often exist; however, project teams simply may not be able to find them given the rapid evolving nature of technology and approaches. To achieve toward zero net energy results, it is imperative to “think outside of the box”, find and consider a range of innovative solution options rapidly, and select the best options based on an evaluation of trade-offs.

*WE CAN'T SOLVE PROBLEMS BY USING  
THE SAME KIND OF THINKING  
WE USED WHEN WE CREATED THEM.  
– ALBERT EINSTEIN*

Another inspirational quote posted at the charrette to motivate participants to think outside the box.

## 6. RIGHT TIMING OF RETROFITS (WITH DEFERRED MAINTENANCE AND OTHER CAPITAL PROJECTS)

Implementing energy retrofits that achieve zero net energy goals are more valuable if they are timed in accordance with certain events in a property's life cycle. The incremental cost of pursuing towards ZNE is significantly reduced when property owners combine project spending with planned spending on capital improvements, which are always required with existing buildings.

There were several examples given on how to capitalize on downstream costs, benefits and added value, such as during major occupancy changes, system replacements and construction of building additions, Coordinating projects significantly improves both the economics and convenience of prior planned stand-alone energy improvements. For example, planned roof, window or siding replacements provide opportunities for significant improvements in daylighting and efficiency at small incremental costs. Coordinating projects enables a deep energy retrofit that reduces loads and the cost of replacing major requirement such as HVAC and lighting.

It was highlighted that the traditional approach of using a simple payback analysis is not recommended. It leaves out all the non-energy cost values that benefit building owners and occupants, such as operation expenditure savings, avoided capital costs and value to the organization's mission.

Using an order-of-magnitude estimate for the financial plan is more successful if it includes the time-based approach to integrating retrofits with deferred maintenance and other non-energy cost values.

## 7. MANAGE POST-PROJECT OPERATIONS



Ray Soohoo and John Crisley, both of DCAMM, lead a discussion on O&M strategies with the charrette break-out group.

Require an energy project (TZNE or conventional) to include development of an energy management plan with energy-efficiency operations as a primary component. While O&M activities are typically addressed in most energy efficiency projects, such as maintaining indoor environmental quality and equipment reliability, there is a greater need to focus on the operations component of O&M management.

Achieving energy-efficiency building operations includes the effective implementation of reporting, control performance management (retro- and ongoing commissioning, optimizing schedules, control strategies, sequence of operations), occupant behavior modification programs and operator training.

O&M staff need energy use reporting in order to implement energy-efficiency strategies and achieve the energy savings envisioned in the planned phases. Energy metering and utility bill reviews are only the beginning. An energy accounting system is needed to measure the success of the energy efficiency measures and locate savings opportunities, and this information needs to be shared with occupants and facility managers. Without this information it is impossible to understand or communicate in any measurable way the progress of the overall energy management plan.

## ACTIONS REQUIRED TO IMPLEMENT TZNE

### Summary Of Recommended Actions

In the afternoon session, participants worked in their break-out groups again. The groups were asked to brainstorm Recommended Actions for each of the seven Best Practices that were identified in the morning session.

DCAMM organized the Recommended Actions by those that could be implemented immediately, labeled as “Just Do It” (JDI), and those that would require a longer time to implement, labeled as “Long Term” (LT).

When the break-out groups reported out to the full group, overlap and duplication was noted, which helped to confirm the validity of the Recommended Actions. The comprehensive list of JDIs are the result of brainstorming from all six groups. Many ideas overlap and need to be prioritized according to resource availability. The Long Term recommendations will be evaluated more strategically and implemented as approved by senior agency staff.

A comprehensive list of the Recommended Actions for each Best Practice follows on the next pages.

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**Just Do It:** *Improve early planning with standardized TZNE deliverables (including Owner’s Project Requirements and Basis of Design throughout design process)*

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*DISCOVERY CONSISTS OF SEEING WHAT EVERYBODY HAS SEEN AND THINKING WHAT NOBODY HAS THOUGHT.*  
— ALBERT SZENT-GYORGYI

One of the inspirational quotes posted at the charrette to motivate participants to strategize on how to think outside the box for innovative solutions.

## 1. ASSIGN THE RIGHT TEAM

### Just Do It

- A. Define TZNE team structure and all required members at start of project
  - 1. Include agency leadership, facility managers, maintenance personnel, building occupants, consultants (facility advisors, designers) and DCAMM personnel (OPDC, Finance, Legal and Environmental)
- B. Update the consultant Scopes of Work to require inclusion of qualifications of team members (consultants) with experience on TZNE projects (both energy reduction and renewable energy systems)
- C. Hold TZNE Charrette at start of project
- D. Use Central Desktop as an online collaborative software in the short term

### Longer Term

- E. Assign one point of contact at DCAMM to integrate all projects into a single comprehensive site-wide plan.
- F. Explore how to use additional online collaborative software such as “BaseCamp” software (or procure through project team)



During the morning and afternoon sessions, lively discussions and brainstorming took place among group participants.

## 2. DEFINE ZNE GOALS AND ALIGN WITH EXISTING CONDITIONS

### Just Do It

- A. Review and update the Capital Asset Management Information System (CAMIS) data before bringing on Facility Advisor
- B. Update DCAMM Facility Advisor Scope of Work to:
  - 1. Review facility conditions assessment (if available), repair plans, deferred maintenance plan and facility improvements
  - 2. Hold TZNE Charrette at start of project to agree on TZNE goals (energy reduction and renewable energy)

3. Target deep energy ECMs and plug load reduction (with occupant behavior modification)
4. Conduct comprehensive assessment of renewable energy system opportunities

### **Longer Term**

- C. Coordinate with Integrated Facility Management (IFM) initiative
- D. Develop parameters on which scope to use (American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Level I, II, III)
- E. Update Facility Advisor scope of work to include the integration of additional site and facility information (e.g. building lifetime, building orientation and siting, existing energy performance, energy efficiency threshold for on-site renewables, and programming use-type)

## **3. GET BUY-IN AT ALL LEVELS**

### **Just Do It**

- A. Develop “stakeholder engagement and communication plan” to adjust culture and organizational thinking that includes:
  1. Schedule of communication with agency and other team members
  2. Engagement with building occupants for plug load reduction
  3. How project will increase efficiency and meet goals
  4. Information on how energy efficiency savings can be used for respective programs
  5. Feedback loop to group

### **Longer Term**

- B. Develop a new Lifecycle Cost Analysis (LCCA) tool to estimate savings in addition to utilities
- C. Revisit state operating as energy service company (ESCO) to capture operational savings – IFM
- D. Include energy savings and energy budget in all facility upgrades
- E. Use electronic filing and enhance access between silos
- F. Establish a high level directive/target from Governor or Administration and Finance (ANF)
  1. Deeper retrofits
  2. Resiliency
- G. Explore opportunities to study effects of climate change on sites (e.g. flood plan changes, etc.)

## **4. ESTABLISH INTEGRATED PROCESSES**

### **Just Do It**

- A. Improve early planning with standardized TZNE deliverables (including Owner’s Project Requirements and Basis of Design throughout design process)

## Longer Term

- B. Update Consultant Scope of Work to enable integrated team planning at start of project (and eliminate hand-off between Facility Advisors and House Doctors)
- C. Encourage E-Team representative involvement during construction
- D. Investigate or pilot using an independent cost estimator and value engineering
- E. Develop energy master plan for each site at start of project
  - 1. Define TZNE goals specific to project
  - 2. Define dates
  - 3. Prioritize and incorporate programmatic changes
  - 4. Link to energy plan and overall DCAMM portfolio

## 5. INCORPORATE INNOVATIVE SOLUTIONS



Hope Davis and John Crisley, both of DCAMM, listen intently to their group's discussion. Dave Ward, of EE&D, facilitates his group's brainstorming session as participants offer their "Just Do It" solutions. Heidi Green, of DCAMM, listens as John Swift of CannonDesign offers his ideas on "Longer Term" strategies.

### Just Do It

- A. Provide case study presentations (as part of TZNE Project Manager Toolkit)
- B. Publish and update quarterly a "Current List of Innovative Technology" with FM skills needed (including contracted maintenance support)
- C. Update Facility Advisor scope of work to include assessment of facility maintenance staff's expertise to maintain/operate innovative technology
- D. Ensure energy project construction contracts include training of facility managers on innovative technology as part of installation
- E. Integrate innovative technology slowly into portfolio

### Longer Term

- F. Strategically select and promote innovative technology through the "Current List of Innovative Technology"
- G. Evaluate and/or test innovative technology to reduce risk of maintenance problems for facility managers

H. Train consultants to evaluate new technology that would be good fit for state facilities

## 6. RIGHT TIMING OF RETROFITS (WITH DEFERRED MAINTENANCE AND OTHER CAPITAL PROJECTS)

### Just Do It

- A. Update consultant Scopes of Work to include development of a longer-term TZNE plan that is integrated with facility repairs, replacements, deferred maintenance and capital plans
- B. Develop strategic analysis of problem and plan for use of resources (Clean Energy Investment Program (CEIP) vs. Capital Funding)

### Longer Term

- C. Don't constrain team based on lost lifetime costs, operational needs and costs
- D. Establish DCAMM – Agency coordination plan including:
  1. Software
  2. Charrette/focus group for each project
  3. Prioritization
  4. Equipment and system age
  5. Resources (staff and finances)
- E. Link between existing conditions and CAMIS (improved data quality)
- F. Require a state-level mandatory deferred maintenance plan (every 5 years)

## 7. POST PROJECT OPERATIONS



Eric Freidman and Maggie McCarey, both of DOER, and David McDougall, of Enernoc, share common themes for successes, long term strategies, and solutions from their individual break-out groups.

### Just Do It

- A. Hire an energy performance management firm (such as expanded facility advisor) to partner with facility throughout retrofits and keep site at high performance during post project operations

1. Initiate continuous Retro Commissioning at start of projects make adjustments as necessary
2. Provide performance monitoring such as analysis of utility bills and meters with reports and guidance on actions
3. Evaluate whether there is a benefit to metering or sub-metering
4. Provide building occupant behavioral modification support including visibility into data and Reports, and recognition to occupants
5. Train facility managers to be able to manage energy and operations going forward

### **Longer Term**

- B. Include indirect benefits in LCCA as much as possible
- C. Determine type of feedback needed for finance staff

### **OVERALL PROGRAM-LEVEL ACTIONS**

- A. Select a small number of AEP sites to pilot the new TZNE retrofit approach.
- B. Update consultant scopes of work based on recommended actions listed below.
- C. Develop a TZNE Project Toolkit with sample deliverables and guides for DCAMM Project Managers. Include documents such as:
  1. Screening tool to identify the best Commonwealth sites
  2. Initial planning checklist and package requirements
  3. Integrated design guide
  4. Sample documents (Owners Project Requirements, Basis of Design, etc.)
  5. Updated Scopes of Work for facility advisors and house doctors
  6. TZNE best practices
  7. Innovative technology case studies
  8. Training on “How to get and use energy usage data”

## APPENDICES

## APPENDIX A: AGENDA

The 4-hour TZNE Charrette was structured with multiple sessions. These sessions allowed participants to focus on discussions within six small break-out groups as well as an opportunity to share and converse with the entire group of attendees.

The following is the agenda:

### **Toward Zero Net Energy Retrofits Charrette**

September 13, 2013, 10:00am to 2:00pm

Leverett Saltonstall Building, First Floor Conference Rooms C & D,  
100 Cambridge Street, Boston MA 02114

10:00 – 10:15	Welcome	Mark Sylvia, Commissioner, DOER
10:15 – 10:25	Introductions	Kevin Bernier, AEP Consultant
10:25 – 10:45	Towards ZNEB Retrofits	Jenna Ide, Deputy Director, DCAMM Eric Friedman, Deputy Director, DOER
10:45 – 11:30	Break-out Session #1	Everyone
11:30 – 12:00	Report Out	
12:00 – 12:15	Break	
12:15 – 12:30	Group Discussion	Everyone
12:30 – 1:15	Break-out Session #2	Everyone
1:15 – 1:45	Report Out	
1:45 – 2:00	Summary & Next Steps	Kevin Bernier, AEP Consultant

## APPENDIX B: PARTICIPANTS

There were a total of 74 participants in the Charrette. The participants were divided into six break-out groups. Each group included architects, energy engineers, planners, educators, facility managers, consultants, DCAMM and DOER staff. The following table provides the name and organization of each participant, organized by the six break-out groups.

### Group 1 Participants

		Machado, Andy	Cadmus
Dover, Tony	DCAMM/AEP Team	Gorer, Peter	Facility Asset Strategies
Caron, Jeremy	DCAMM/AEP Team	Foran, Christy	U.S. Army Corps of Engineers
Claeys, Bram	DOER	Auguste, Carl	Utilities, NStar
Antoniewicz, Paul	Agency Representative/ Courts	Rooney, Tom	TRC
Davis, Doug	DCAMM/OPDC	McCrorry, Marilyn	Agency Representative/ DCR
Fay, Dick	SourceOne		

### Group 2 Participants

		Robinson, Suzanne	Vanderweil
Freeley, James A.	DCAMM/AEP Team	Hank Ouimet	Weston & Sampson
Crisley, John	DCAMM/AEP Team	Hall, Johanna	W & S
Coleman, Patrick	DOER	Soohee, Ray	DCAMM/AEP Team
Deknatel, Charlie	DCAMM/OPDC	Brown, Stephen D.	Agency Representative/ DCR
Shah, Shailesh	DCAMM/OPDC		
Osser, Roselin E.	WSP		
Ham, Chris	KlingStubbins		

### Group 3 Participants

		Swift, John	CannonDesign
Ransom, Edward	DCAMM/AEP Team	Dimodica, John	Noresco
Green, Heidi J.	DCAMM/AEP Team	Wiehe, Stephen	Weston & Sampson
Finlayson, Ian	EOEEA	McMahon, Marie	Utilities, National Grid
Goldberg, Selena	DCAMM/OPDC	Lewin, David	DCAMM/AEP Team
Weisz, Al	DCAMM/OPDC		

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**Group 4 Participants**

Ward, David	EE&D	Zweig, Ellen	EllenZweig
McIntosh, Chris	DCAMM/AEP Team	Philbin, Tom	Nxegen
Lucas, Melissa	Sustainability Manager/ UMass Medical School	Mitchell, Rick	B2Q
Walter, Thomas Lecturer	UML Engineering	Cascadden, Creg	Fay, Spofford and Thorndike
Lynch, David	DCAMM/OPDC	Jones, Andrew	RMF
Walsh, Mark	ARUP	Bakinowski, Andy	Agency Representative/ DOC

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**Group 5 Participants**

Friedman, Eric	DOER	Lewis, David	DCAMM/AEP Team
Reinhardt, Michael	DCAMM/AEP	McKenzie, Mary Beth	Agency Representative/ Fitchburg State
O'Connor, Stephen	DCAMM/OPDC	Weisman, Steven	Peregrine
Goldsmith, Wendi	BioEngineering	Travers, Mike	Fay, Spofford and Thorndike
McDougall, David	Enernoc	Graham, Erin	Agency Representative/ DCR
Cuevas, Emil	CannonDesign		
Healey, Eric	SourceOne		

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**Group 6 Participants**

McCarey, Maggie	DOER	Galloway, Elizabeth	SMMA
Tremblay, David	Penley Systems	Richmond, Mary	DCAMM/OPDC
Rao, Karthik	Enernoc	Anderson, Dan	Anderson Porter Design
Jones, Brad	Cadmus	Quick, Jeffrey	Director of Facilities/ DOC
Tangredi, Paul	Clear Result	Jones, Yvonne	Agency Representative/ DCR
Hesse, Shawn	Emersion Design		
Bjorklund, Abbe	Sebesta		

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## APPENDIX C: BREAK-OUT SESSION REPORT-OUTS

The TZNE Retrofits Charrette included two breakout sessions. The breakout groups brainstormed on the assignment and then gave a report-out to all participants of the Charrette.

In the morning, the breakout groups were asked to define 3-5 success elements or best practices from prior ZNE projects and potential challenges of implementing these success elements on DCAMM projects.

In the afternoon, the breakout groups were asked to identify potential strategies to address each challenge, and annotate as “Just Do It” (JDI) or “Longer Term”.

This appendix provides the morning and afternoon report-outs provided by each group.

### GROUP 1- MORNING SESSION

Success Elements from Prior ZNE Projects	Challenges
<ol style="list-style-type: none"> <li>1. Whole Building Analysis               <ol style="list-style-type: none"> <li>a. Comprehensive</li> <li>b. Retro-commissioning</li> <li>c. Accurate baseline</li> </ol> </li> </ol>	<ul style="list-style-type: none"> <li>• Cost, scope, quality and energy efficiency</li> </ul>
<ol style="list-style-type: none"> <li>2. Stakeholder buy-in               <ol style="list-style-type: none"> <li>a. Executive to maintenance</li> <li>b. Early in process</li> </ol> </li> </ol>	<ul style="list-style-type: none"> <li>• Buy-in from tenant and operations</li> <li>• Lack of incentives (carrots and sticks)</li> <li>• Getting staff participation</li> <li>• Getting executive understanding and buy-in</li> <li>• Policy limitations</li> </ul>
<ol style="list-style-type: none"> <li>3. Energy Master Plan               <ol style="list-style-type: none"> <li>a. Incremental</li> <li>b. Road map</li> <li>c. Timing triggers/opportunities</li> </ol> </li> </ol>	<ul style="list-style-type: none"> <li>• Funding</li> </ul>
<ol style="list-style-type: none"> <li>4. Education &amp; Operations               <ol style="list-style-type: none"> <li>a. Lessons learned</li> <li>b. Training (staff and occupants)</li> </ol> </li> </ol>	<ul style="list-style-type: none"> <li>• Timing and emergencies</li> <li>• Phasing</li> <li>• Lack of informed and qualified staff</li> <li>• Operational and behavioral modifications</li> </ul>
<ol style="list-style-type: none"> <li>5. Operational Modifications               <ol style="list-style-type: none"> <li>a. Occupancy period</li> <li>b. Policies, procedures, (telecommuting, off-site, IT)</li> </ol> </li> </ol>	<ul style="list-style-type: none"> <li>• Existing conditions (both building age and systems)</li> <li>• Transition challenges (construction to operations)</li> </ul>

## GROUP 1- AFTERNOON SESSION

Success Element	Challenges	Strategies or Action Item
1. Define Goals and Know Existing Conditions and Align		<ul style="list-style-type: none"> <li>• Building lifetime</li> <li>• Orientation/siting</li> <li>• Existing performance</li> <li>• Efficiency threshold for on-site renewables</li> <li>• Programming/use-type</li> <li>• <b>Net Zero Checklist (JDI)</b></li> <li>• Target Identification (scope/technology)</li> <li>• Timing with Deferred Maintenance (DM)</li> </ul>
2. Integrated Process: WBA, Master Plan, BOD		
3. Integrated Team: Right Team and Right Size		
4. Buy-In: At ALL Levels		
5. Right Timing with Deferred Maintenance: Capitalize on Downstream Costs, Benefits and Added Value		<ul style="list-style-type: none"> <li>• <b>Agency project communication (JDI)</b></li> <li>• <b>Schedule of communication (JDI)</b></li> <li>• DCAMM – Agency coordination on the following items: <ul style="list-style-type: none"> <li>• Software</li> <li>• Charrette/focus group</li> <li>• Prioritization</li> <li>• Equipment and system age</li> <li>• Resources (staff and finances)</li> </ul> </li> <li>• State level mandatory DM plan (every 5 years)</li> <li>• Coordinate repair/replacement/improvements</li> </ul>
6. Post Project: Cx-Ongoing, Performance, Ops Training, Behavior/Occupant		
7. Innovation: Innovative Tech, Unique Site Opportunities		

\*\* Red font means identified by DCAMM management for implementation during Charrette

## GROUP TWO - MORNING SESSION

Success Elements from Prior ZNE Projects	Challenges
1. Confirm accuracy of model assumptions	
2. Integrative design team process	<ul style="list-style-type: none"> <li>• Utility company restrictions – interconnections, cost of upgrades, review times, etc.</li> <li>• Early involvement with utilities and municipals</li> </ul>
3. Transparency of information-sharing (design, engineering information)	
4. Optimization of existing opportunities <ol style="list-style-type: none"> <li>a. Clearly defining the parameters of the building</li> <li>b. Balancing building function with operations and energy efficiency</li> </ol>	<ul style="list-style-type: none"> <li>• Long term commitment to the end result (e.g., Towards ZNE) and the many historical, legal, permits and existing condition challenges</li> </ul>
5. Looking at different opportunities (technology appropriate for facility and site)	<ul style="list-style-type: none"> <li>• Overcoming perceptions of new technology</li> </ul>
6. Integrating systems for maximum effect	
7. Understand existing opportunities – defining what your starting with (investigation stage)	<ul style="list-style-type: none"> <li>• Code issues and existing conditions</li> </ul>

## GROUP TWO - AFTERNOON SESSION

Success Element	Challenges	Strategies or Action Item
1. Define Goals and Know Existing Conditions and Align	<ul style="list-style-type: none"> <li>• Problem definition and opportunity definition</li> </ul>	<ul style="list-style-type: none"> <li>• Existing conditions audit and clearly defined owners project requirements (up front) (JDI)</li> <li>• Develop parameters on which scope to us (ASHRAE Level I, II, III) (JDI)</li> </ul>
2. Integrated Process: WBA, Master Plan, BOD	<ul style="list-style-type: none"> <li>• Know who the right people involved in project and getting them all in the same room</li> </ul>	<ul style="list-style-type: none"> <li>• Use technology to communicate effectively (JDI)</li> </ul>
3. Integrated Team: Right Team and Right Size		<ul style="list-style-type: none"> <li>• Qualify team members (consultants) based on experience (JDI)</li> </ul>
4. Buy-In: At ALL Levels		
5. Right Timing with Deferred Maintenance: Capitalize on Downstream Costs, Benefits and Added Value	<ul style="list-style-type: none"> <li>• How do we manage better deferred maintenance?</li> <li>• How do we anticipate problems (timing)?</li> </ul>	<ul style="list-style-type: none"> <li>• Link between existing conditions and CAMIS (improved data quality) (LT)</li> <li>• Strategic analysis of problem and use of resources (CEIP vs. CAP) (JDI)</li> </ul>
6. Post Project: Cx-Ongoing, Performance, Ops Training, Behavior/Occupant		
7. Innovation: Innovative Tech, Unique Site Opportunities	<ul style="list-style-type: none"> <li>• Perception of risk of new technology</li> </ul>	<ul style="list-style-type: none"> <li>• Case study presentations (JDI)</li> <li>• Need for adequate trained personnel (JDI)</li> <li>• List of associated technology and skills needed (JDI)</li> <li>• Contracted maintenance and/or extended maintenance (JDI)</li> </ul>

\*\* Red font means identified by DCAMM management for implementation during Charrette

## GROUP THREE - MORNING SESSION

Success Elements from Prior ZNE Projects	Challenges
1. Aligning installation with deferred maintenance	<ul style="list-style-type: none"> <li>• Integrative planning</li> </ul>
2. Holistic approach – phased planning	<ul style="list-style-type: none"> <li>• Time constraints, reactive approach, linear thinking</li> </ul>
3. Clear definition of problem and end goal	<ul style="list-style-type: none"> <li>• Mis-alignment of scope due to inflexibility of process</li> </ul>
4. Buy-in by user group and stakeholders	<ul style="list-style-type: none"> <li>• Apathy</li> </ul>
5. Finding and having site flexibility	<ul style="list-style-type: none"> <li>• Existing conditions and regulations</li> </ul>
6. Maximize on-site energy production	<ul style="list-style-type: none"> <li>• Challenges #1, 3 and 5</li> </ul>
8. Ongoing Cx	<ul style="list-style-type: none"> <li>• Property management issues and apathy</li> </ul>
9. Financial incentives and capitalizing on downstream savings	<ul style="list-style-type: none"> <li>• Identification of available programs</li> </ul>

## GROUP THREE - AFTERNOON SESSION

Success Element	Challenges	Strategies or Action Item
1. Define Goals and Know Existing Conditions and Align		
2. Integrated Process: WBA, Master Plan, BOD		<ul style="list-style-type: none"> <li>• Develop energy master plan for each facility (LT) <ul style="list-style-type: none"> <li>• Goals and dates</li> <li>• <b>Prioritize</b></li> <li>• <b>Incorporate programmatic changes</b></li> <li>• Link master plan to energy plan</li> <li>• Strategic plan linked to overall DCAMM portfolio</li> <li>• <b>More custom energy efficiency goal specific to each project</b></li> </ul> </li> <li>• <b>Change focus to ECMs targeted to deep energy retrofits and how they are integrated into overall energy efficiency (JDI)</b></li> </ul>
3. Integrated Team: Right Team and Right Size		
4. Buy-In: At ALL Levels		<ul style="list-style-type: none"> <li>• <b>Client agencies discuss priorities (JDI)</b></li> <li>• <b>Educate users on existing baseline and how project will increase efficiency (JDI)</b></li> <li>• <b>Users participate in project and engage</b></li> <li>• Inform users on how energy efficiency savings will enable them to use energy savings for respective programs (LT)</li> <li>• Revisit state operating as ESCO (capture operational savings – IFM)</li> </ul>
5. Right Timing with Deferred Maintenance: Capitalize on Downstream Costs, Benefits and Added Value		
6. Post Project: Cx-Ongoing, Performance, Ops Training, Behavior/Occupant		
7. Innovation: Innovative Tech, Unique Site Opportunities		<ul style="list-style-type: none"> <li>• Integrate slowly into portfolio</li> <li>• <b>Need to know skill level of facility staff to know if they can maintain/operate technology (expertise) (JDI)</b></li> <li>• Strategic selection of technology</li> <li>• Need to be tested enough for facility to be comfortable</li> <li>• Consultant retained to evaluate new technology that would be good fit for state facilities</li> </ul>

\*\* Red font means identified by DCAMM management for implementation during Charrette

## GROUP FOUR - MORNING SESSION

Success Elements from Prior ZNE Projects	Challenges
1. ZNE is the goal from the beginning	
2. Negotiated Basis of Design (BOD) with integrated design team	<ul style="list-style-type: none"> <li>• How does DCAMM make the time (resources, people and \$)</li> <li>• Lack of process</li> <li>• Contract process (hand off to next agency/ vendor, structure in silos based on economics)</li> <li>• Avoid the risk</li> <li>• Quality and awareness of data</li> <li>• Need for integrated team</li> </ul>
3. Performance verification and continuous commissioning	<ul style="list-style-type: none"> <li>• How does DCAMM make the time (resources, people and \$)</li> <li>• Lack of continuous commissioning</li> <li>• Cost of continuous upgrades of M&amp;V</li> <li>• Not currently done well</li> <li>• Contractor defined Cx plan for different building types</li> </ul>
4. Awareness and training	<ul style="list-style-type: none"> <li>• How does DCAMM make the time (resources, people and \$)</li> <li>• Quality and awareness of data</li> <li>• Performance reviews of occupants</li> <li>• Include occupants in process</li> </ul>

## GROUP FOUR - AFTERNOON SESSION

Success Element	Challenges	Strategies or Action Item
1. Define Goals and Know Existing Conditions and Align		
2. Integrated Process: WBA, Master Plan, BOD		
3. Integrated Team: Right Team and Right Size	<ul style="list-style-type: none"> <li>• Put right team together</li> <li>• Statutes limitations</li> </ul>	<ul style="list-style-type: none"> <li>• DCAMM ask for right people (JDI) <ul style="list-style-type: none"> <li>• Identify which people in RFP (finance, facility, occupant, design, maintenance, environmental, admin)</li> </ul> </li> <li>• Put together info package for success elements #2 and #3 and include alternatives in RFP (JDI)</li> <li>• Build for success (JDI)</li> </ul>
4. Buy-In: At ALL Levels	<ul style="list-style-type: none"> <li>• Break silos of portfolio management</li> <li>• Too many people to call</li> </ul>	<ul style="list-style-type: none"> <li>• Culture/organizational rethinking (LT)</li> <li>• Include savings/budget in upgrades (LT)</li> <li>• Use electronic filing and access between silos (LT)</li> <li>• Feedback loop to group (LT)</li> </ul>
5. Right Timing with Deferred Maintenance: Capitalize on Downstream Costs, Benefits and Added Value		
6. Post Project: Cx-Ongoing, Performance, Ops Training, Behavior/Occupant	<ul style="list-style-type: none"> <li>• Accountability</li> <li>• Training</li> <li>• Incentivize behavior</li> </ul>	<ul style="list-style-type: none"> <li>• Recognition for occupants (JDI)</li> <li>• Initiate continuous RCx at start and training (JDI)</li> <li>• Ongoing performance monitoring (JDI)</li> <li>• Feedback to fiscal office (LT)</li> </ul>
7. Innovation: Innovative Tech, Unique Site Opportunities		

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## GROUP FIVE - MORNING SESSION

Success Elements from Prior ZNE Projects	Challenges
2. Integrated Processes <ol style="list-style-type: none"> <li>a. Up-front goal and target</li> <li>b. Early stakeholder engagement and buy-in</li> <li>c. Integrated design</li> <li>d. Iterative process before and after</li> </ol>	<ul style="list-style-type: none"> <li>• Lack of sufficient budget and time for integration</li> <li>• Conflicting goals</li> </ul>
3. Inter-disciplinary Team <ol style="list-style-type: none"> <li>a. Committed,</li> <li>b. Positive,</li> <li>c. Experienced,</li> <li>d. Knowledgeable,</li> <li>e. Creative</li> </ol>	<ul style="list-style-type: none"> <li>• Don't have total control of team members</li> </ul>
3. Whole Building Approach <ol style="list-style-type: none"> <li>a. Understand operational characteristics of building equipment</li> <li>b. Focus on envelope through design and construction</li> <li>c. Identify interactive effects of system</li> <li>d. Identify available resources, particularly thermal</li> <li>e. Total cost of ownership mindset</li> </ol>	<ul style="list-style-type: none"> <li>• New ideas versus old processes</li> </ul>
4. Commissioning and Sustainable Operations	<ul style="list-style-type: none"> <li>• Staffing skill set</li> <li>• Budget gaps over time</li> <li>• Buy in for commissioning</li> </ul>

## GROUP FIVE - AFTERNOON SESSION

Success Element	Challenges	Strategies or Action Item
1. Define Goals and Know Existing Conditions and Align		<ul style="list-style-type: none"> <li>• Online collaboration for project management such as “BaseCamp” software (LT)</li> </ul>
2. Integrated Process: WBA, Master Plan, BOD		<ul style="list-style-type: none"> <li>• Adopt value engineering processes as part of AEP (LT)</li> </ul>
3. Integrated Team: Right Team and Right Size		<ul style="list-style-type: none"> <li>• One point of contact at DCAMM to integrate all site projects or integrate site into one plan (LT)</li> </ul>
4. Buy-In: At ALL Levels		<ul style="list-style-type: none"> <li>• Integrate stakeholder engagement plan throughout process (JDI)</li> <li>• High level directive/target – Governor? ANF? (LT) <ul style="list-style-type: none"> <li>• Deeper retrofits</li> <li>• Resiliency</li> <li>• Climate adaptation</li> </ul> </li> </ul>
5. Right Timing with Deferred Maintenance: Capitalize on Downstream Costs, Benefits and Added Value		<ul style="list-style-type: none"> <li>• Update Scope of Work (JDI) <ul style="list-style-type: none"> <li>• Include language on going deeper, innovation</li> <li>• Don’t constrain based on lost lifetime costs, operational needs &amp; costs</li> </ul> </li> </ul>
6. Post Project: Cx-Ongoing, Performance, Ops Training, Behavior/Occupant	<ul style="list-style-type: none"> <li>• Accountability</li> <li>• Training</li> <li>• Incentivize behavior</li> </ul>	<ul style="list-style-type: none"> <li>• Include indirect benefits as much as possible</li> </ul>
7. Innovation: Innovative Tech, Unique Site Opportunities		

\*\* Red font means identified by DCAMM management for implementation during Charrette

## GROUP SIX - MORNING SESSION

Success Elements from Prior ZNE Projects	Challenges
1. Integrated team throughout project and beyond	<ul style="list-style-type: none"> <li>• Getting commitment up-front</li> <li>• Developing performance goals up front</li> <li>• Resource limitations of agency and DCAMM</li> <li>• Changes to existing process – behavior, culture of DCAMM and agencies and utilities</li> </ul>
2. Whole building approach	<ul style="list-style-type: none"> <li>• Up-front modeling</li> <li>• ROI</li> <li>• Basis of Design at RFP stage</li> <li>• Requirements for consultants up front</li> <li>• More time and money</li> <li>• More time for design to save time and challenges later</li> <li>• Good data and goals</li> </ul>
3. Post-project maintenance, tracking results, O&M	<ul style="list-style-type: none"> <li>• No existing structure/processes</li> <li>• Agencies have limited resources and need DCAMM support</li> <li>• Ability to modify building users' behavior and culture</li> <li>• Portfolio vs. project approach</li> </ul>

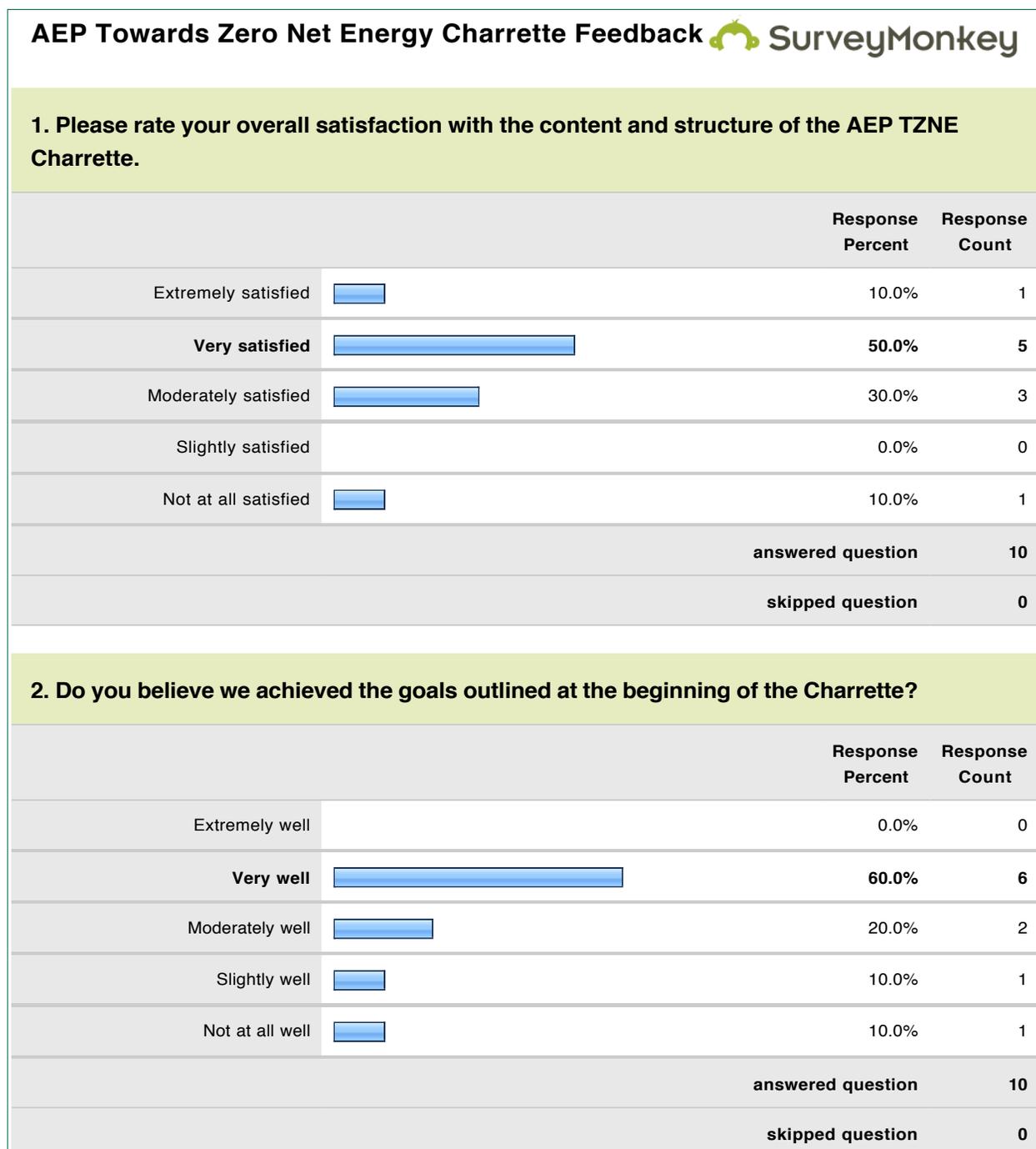
## GROUP SIX - AFTERNOON SESSION

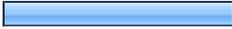
Success Element	Challenges	Strategies or Action Item
1. Define Goals and Know Existing Conditions and Align		<ul style="list-style-type: none"> <li>• Update CAMIS data before brining on Facility Advisor</li> <li>• Get accurate usage data before Facility Advisor</li> <li>• Coordinate with IFM (LT)</li> </ul>
2. Integrated Process: WBA, Master Plan, BOD		<ul style="list-style-type: none"> <li>• Independent cost estimator</li> <li>• Create and validate Basis of Design throughout design process</li> <li>• DCAMM bring expert to define integrated design and what is expected from consultants</li> <li>• Integrated Design Guide Book</li> <li>• Clarify performance metrics, deliverables and required upfront modeling for consultants</li> <li>• E-Team representative during construction</li> <li>• Eliminate hand-off between Facility Advisors and House Doctors (LT)</li> </ul>
3. Integrated Team: Right Team and Right Size		
4. Buy-In: At ALL Levels		<ul style="list-style-type: none"> <li>• Agency sign off on requisitions</li> </ul>
5. Right Timing with Deferred Maintenance: Capitalize on Downstream Costs, Benefits and Added Value		
6. Post Project: Cx-Ongoing, Performance, Ops Training, Behavior/Occupant		<ul style="list-style-type: none"> <li>• Data visibility to end users (LT)</li> <li>• Install metering and monitoring as part of every energy project</li> </ul>
7. Innovation: Innovative Tech, Unique Site Opportunities		

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## APPENDIX D: CHARRETTE SURVEY RESULTS

After the completion of the Charrette, an electronic survey was distributed via SurveyMonkey to all 74 participants to solicit feedback on the event for continuous improvement. A total of 10 participants responded. A summary of the questions and answers is provided.



<b>3. Do you feel that your time was well spent by participating in the Charrette?</b>			
		<b>Response Percent</b>	<b>Response Count</b>
Extremely satisfied		10.0%	1
<b>Very satisfied</b>		40.0%	4
<b>Moderately satisfied</b>		40.0%	4
Slightly satisfied		10.0%	1
Not at all satisfied		0.0%	0
<b>answered question</b>			<b>10</b>
<b>skipped question</b>			<b>0</b>
<b>4. Do you think your ideas were effectively received and incorporated into the guidance?</b>			
		<b>Response Percent</b>	<b>Response Count</b>
Extremely well		0.0%	0
<b>Very well</b>		55.6%	5
Moderately well		22.2%	2
Slightly well		11.1%	1
Not at all well		11.1%	1
<b>answered question</b>			<b>9</b>
<b>skipped question</b>			<b>1</b>

**7. Please rate your overall satisfaction with the productivity and engagement of the break-out sessions.**

		Response Percent	Response Count
Extremely satisfied		10.0%	1
<b>Moderately satisfied</b>		<b>50.0%</b>	<b>5</b>
Slightly satisfied		10.0%	1
Neither satisfied nor dissatisfied		10.0%	1
Slightly dissatisfied		0.0%	0
Moderately dissatisfied		20.0%	2
Extremely dissatisfied		0.0%	0
<b>answered question</b>			<b>10</b>
<b>skipped question</b>			<b>0</b>

**8. Would you participate in another Charrette or Workshop if invited by DCAMM?**

		Response Percent	Response Count
<b>Extremely likely</b>		<b>40.0%</b>	<b>4</b>
Very likely		30.0%	3
Moderately likely		20.0%	2
Not sure		10.0%	1
Probably not		0.0%	0
Definitely not		0.0%	0
<b>answered question</b>			<b>10</b>
<b>skipped question</b>			<b>0</b>

<b>9. Please provide any thoughts or ideas on how we could have made the Charrette more effective.</b>	
	<b>Response Count</b>
	4
<b>answered question</b>	<b>4</b>
<b>skipped question</b>	<b>6</b>

<b>Q9. Please provide any thoughts or ideas on how we could have made the Charrette more effective.</b>		
1	I liked the format of the meeting. The members of my breakout group (dark blue) were excellent. However the facilitator tried to control the discussion tightly and if people's ideas did not address his narrow view of "the topic" he would not write the idea on the board. It was clearly frustrating the group members and stymied discussion.	Oct 4, 2013 10:53 AM
2	Bigger room	Oct 4, 2013 8:41 AM
3	Overall, the structure, goals and facilitation were great. There wasn't enough time for each task and rushing limited quality conclusions. The	Oct 3, 2013 1:05 PM
4	Report out process is fine, but forces people to "boil down" discussion points too far, and much of the content is lost. Alternatively, you could ask each team to report back on only 1 item (that has not already been discussed), extremely in depth, rather than allowing teams to report back the same comments over and over again.	Oct 3, 2013 12:40 PM

*In December 2011, the Accelerated Energy Program (AEP) was established to accelerate the implementation of energy and water savings projects across the Commonwealth and help the Commonwealth comply with Executive Order 484. The AEP aims to reduce energy consumption by 20-25% over 700 state sites, creating about 4,000 clean energy jobs and saving the Commonwealth an estimated \$43 million annually.*

**HOSTED BY**



**REPORT PREPARED BY**

THE ENERGY ENGINEERING & DESIGN TEAM  
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