

CA | Energy Efficiency Strategic Plan

Research and Technology Action Plan Stakeholder Workshop

July 11, 2011

9:00 am – 4:30 pm

**California Energy Commission & California Public Utilities Commission
Joint Workshop**



CEC/PIER & CPUC/ED join forces to develop the R&T Action Plan

Purpose

- Facilitate information exchange and launch the development of the action plan for the Research and Technology (R&T) Chapter of the California Energy Efficiency Strategic Plan CEESP^[1]

Objectives

- Discuss current and future opportunities and key actions needed to achieve both incremental and game-changing technology innovations and functionality for zero net energy (ZNE) building related RDD&D
 - Examples include hot/dry HVAC, energy efficient plug loads devices and controls, integrated building design, building management systems, diagnostics and controls etc.

[1] CPUC, *The California Efficiency Strategic Plan* (January 2011 Update):

http://www.cpuc.ca.gov/NR/rdonlyres/A54B59C2-D571-440D-9477-3363726F573A/0/CAEnergyEfficiencyStrategicPlan_Jan2011.pdf

Agenda

Morning Session 9:00 am – 12:30 pm

Introduction & Overview of the WS 9:00 am – 9:45 am

Panel Discussion 10:00 am – 12:30 pm

1. Planning, Process and Funding
2. Research and Development (R&D)
3. Demonstration, Deployment & Consumer Acceptance

Lunch Break 12:30 pm – 1:30 pm

Afternoon Session 9:00 am – 12:30 pm

Breakout Sessions 1:30 pm – 3:00 pm

1. Planning, Process and Funding
2. R&D in Existing & New/Emerging Technologies
3. Demonstration & Incubators
4. Large-Scale Deployment
5. Consumer Acceptance and Information Dissemination & Knowledge Management System and Market Research

Break 3:00 pm – 3:30 pm	
Report Back from Breakout Sessions	3:30 pm – 4:15 pm
Wrap-up & Next Steps	4:15 pm – 4:30 pm
Adjourn	

- In 2005, CPUC and CEC Energy Action Plan II, declared:

“[The] goal is for California’s energy to be adequate, affordable, technologically advanced, and environmentally-sound...Cost effective energy efficiency is the resource of first choice for meeting California’s energy needs. Energy efficiency is the least cost, most reliable, and most environmentally sensitive resource, and minimizes our contribution to climate change.”

- **In 2006, California Global Warming Solutions Act (AB 32) states:**

“while —California has a long history of success in implementing regulations and programs to encourage energy efficiency... [it] will need to greatly expand those efforts to meet our greenhouse gas emission reduction goals.”

The Draft Scoping Plan, establishes a statewide energy efficiency target of at least 32,000 gigawatt hours and 800 million therms by 2020. If achieved, emission reductions from these efficiency savings would result in over 25 million metric tons of GHG emissions reductions, making them the second largest component in the state's overall emissions reduction program.”

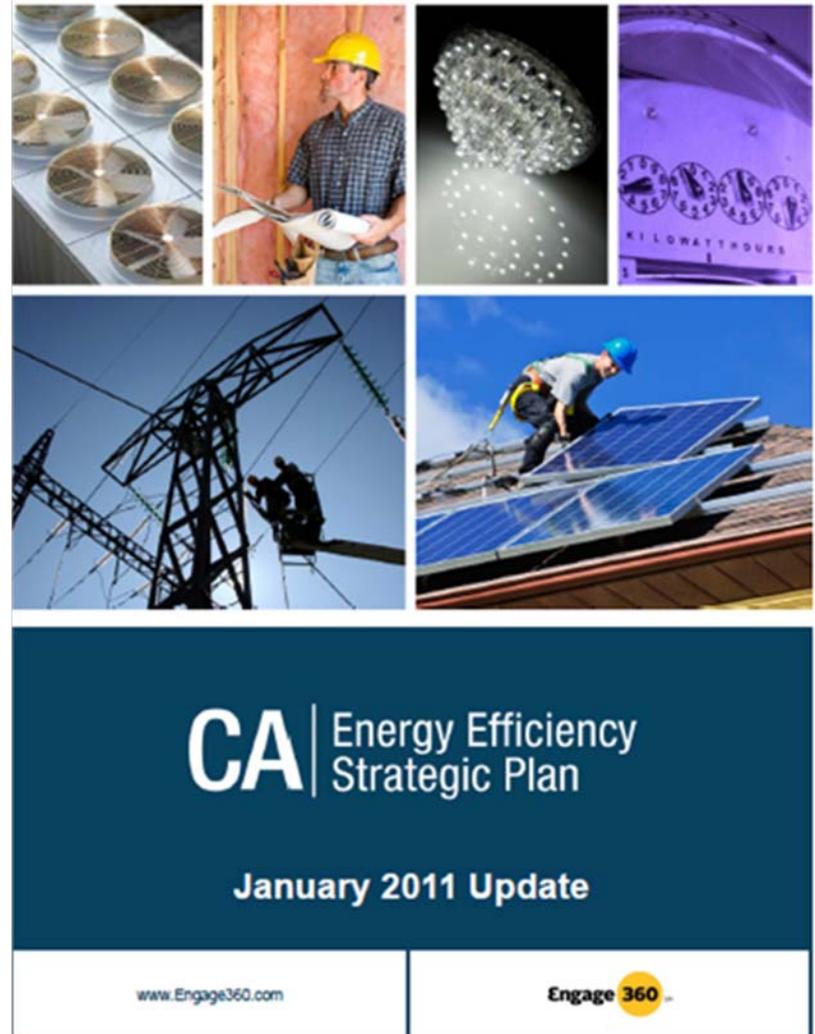
- In 2007 Integrated Energy Policy Report (IEPR), the CEC notes that

“Energy efficiency, which helped to flatten the state’s per capita electricity use, will continue to be the keystone of California’s energy strategy. California’s building and appliance standards have saved consumers more than \$56 billion in electricity and natural gas costs since 1978 and averted building 15 large power plants. It is estimated the current standards will save an additional \$23 billion by 2013.”

California Long Term Energy Efficiency Strategic Plan (CEESP)

CA | Energy Efficiency
Strategic Plan

- In September of 2008, the CPUC adopted California's first Long Term Energy Efficiency Strategic Plan presenting
 - A single roadmap to achieve maximum energy savings across all major groups and sectors in California.
 - Comprehensive Plan for 2009 to 2020 and beyond is the state's first integrated framework of goals and strategies, covering government, utility, and private sector actions, and holds energy efficiency to its role as the highest priority resource in meeting California's energy needs.



- **Some of the key objectives of the CEESP are:**
 - **Employ market transformation (MT) as its unifying objective**
 - **Recognize that the process of MT cannot and should not be driven by ratepayer-funded utility programs alone; e.g. Research and Technology chapter of the CEESP represents a cross-cutting area where *non-utility actors* may well be better positioned to drive the “push” of new technologies to market, or the “pull” for customers and business to adopt available efficiency technologies or practices**
- **In order to guide MT in a number of key sectors, the CEESP embraces four specific programmatic goals, known as the “Big Bold Energy Efficiency Strategies” (BBEES)**

Big Bold Energy Efficiency Strategies



(1) All new residential construction in California will be zero net energy by 2020

(2) All new commercial construction in California will be zero net energy by 2030

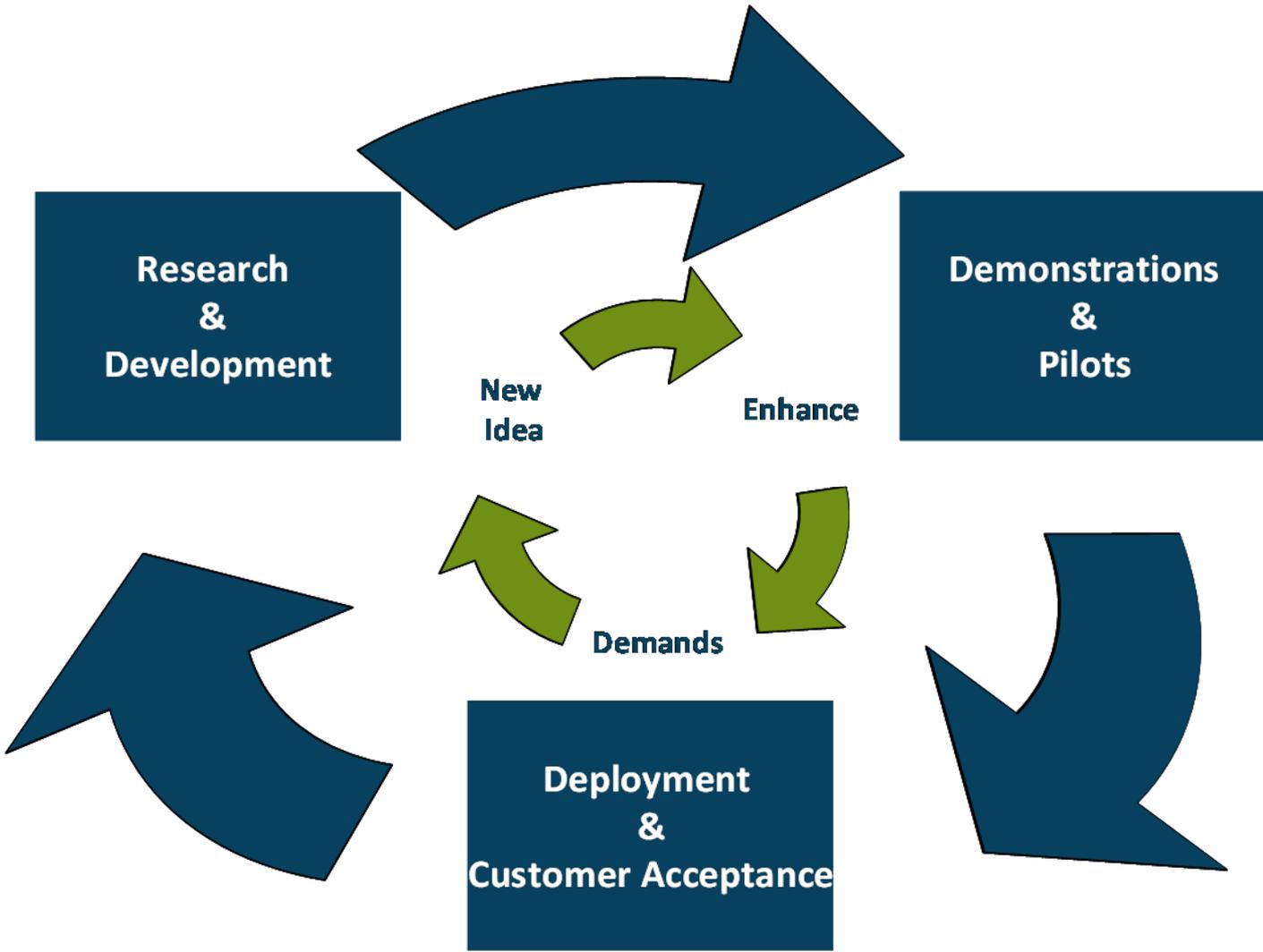
(3) Heating, Ventilation, and Air Conditioning (HVAC) industry will be transformed to ensure that its energy performance is optimal for California's climate



(4) All eligible low-income customers will be given the opportunity to participate in the low energy efficiency program by 2020

- Chapter 11 of CEESP: One of 13 Chapters in CEESP
- **Cross-cutting** chapter targeting Research and Development (R&D), Demonstration and Deployment (D&D), Customer Acceptance and Market Intelligence.
- **Vision:**
 - “Technology advancement related to energy use and demand will match—or even eclipse—the consumer electronics industry in **innovation**, **time to market**, and **consumer acceptance**.” (CEESP, page 79)

Research and Technology Chapter (cont..)



Research and Technology Chapter Cont..

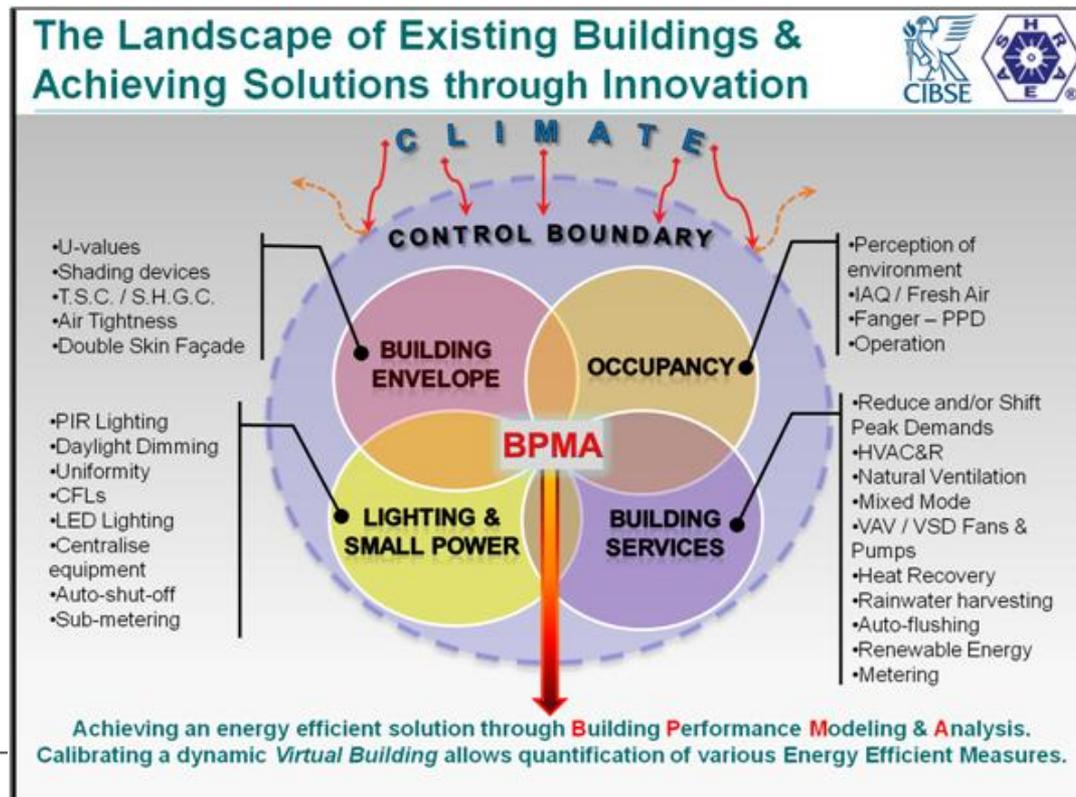
Goal	Goal Results
1. Refocus utility and Energy Commission energy efficiency research and technology support to create demand pull and set the research agenda for both incremental and game-changing energy efficiency technology innovations.	Ratepayer-funded R&D programs will explicitly support widely applicable whole-building improvement, lighting, and plug load solutions envisioned in this Plan and will be used to leverage other private and public funds for the deployment of new technologies.
2. Conduct targeted emerging technologies R&D to support the Big, Bold Energy Efficiency Strategies and integrated energy solutions goals.	Profound improvement in equipment efficiency as well as new building materials and designs aimed at achieving more efficiency from new buildings than technically feasible today, and necessary to achieve Zero Net Energy and hot/dry climate HVAC outcomes.

- **Quotes from the R&T Chapter**

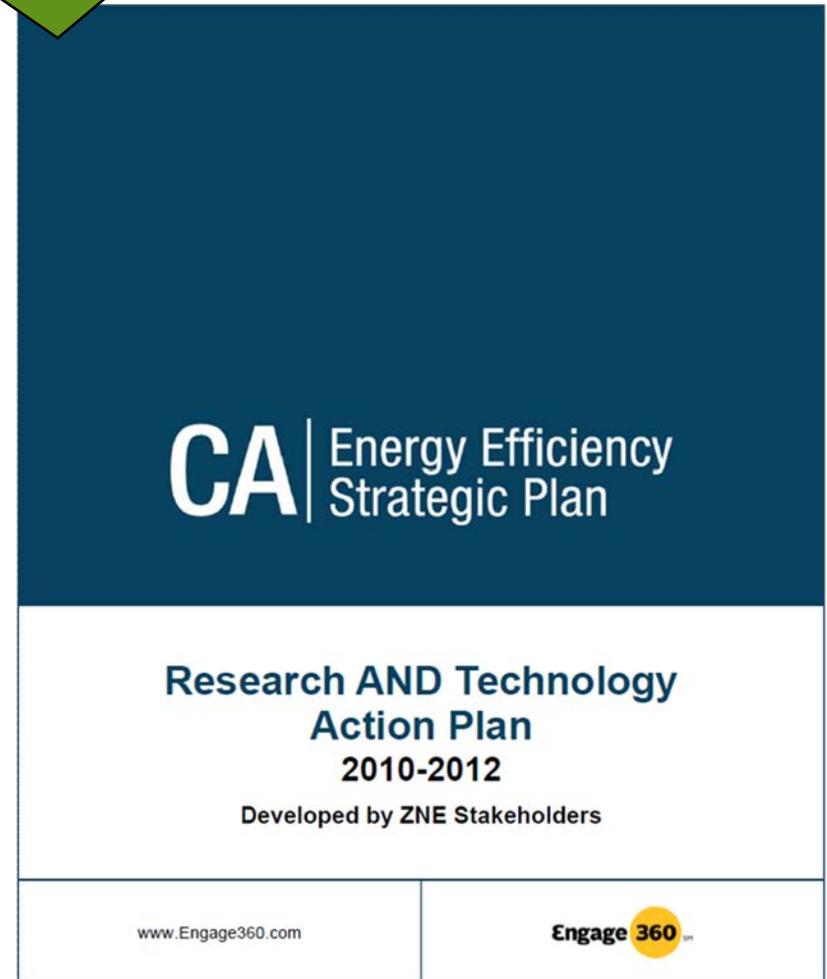
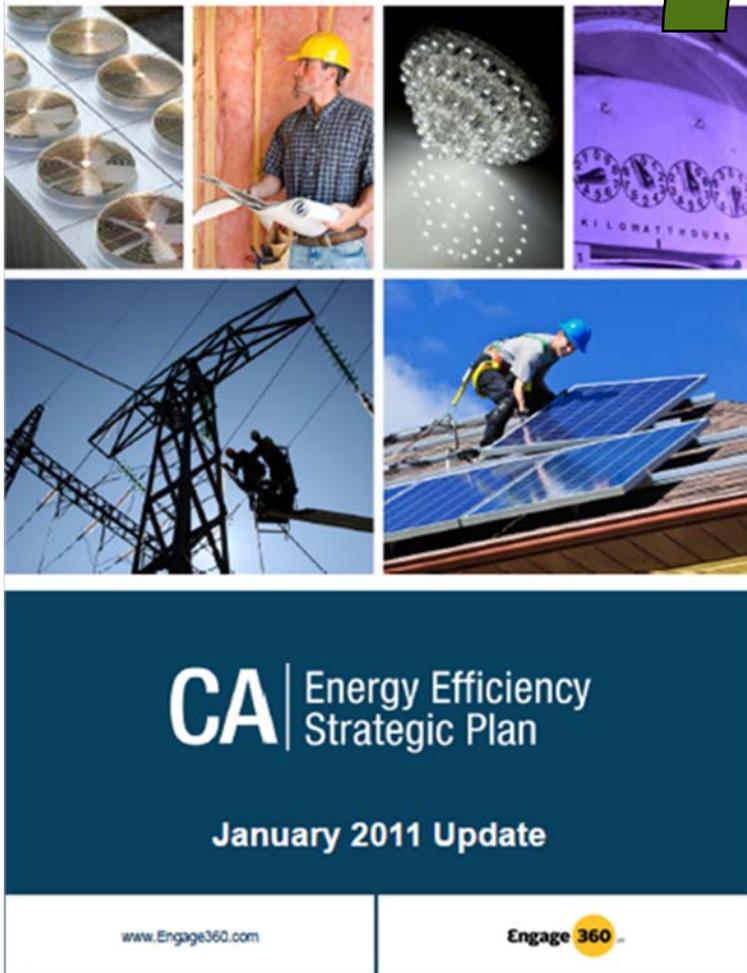
“While new buildings and industrial facilities offer good opportunities to adopt new advanced technologies, this construction replaces only 1-2 percent of the existing stock each year. To make rapid progress with energy efficiency will also require making ***incremental technology improvements that can be inserted into California’s existing buildings and industrial facilities.*** It will be important that research on ***advanced technologies pursue paths that target breakthrough*** as well as incremental technologies and their performance gains.” (CEESP, page 80)

Research and Technology Chapter (cont..)

“To stimulate major breakthroughs in support of BBEES there must be an *intensive focus on the technologies, products, and practices driving the majority of building energy use*, as well as *integrated building design approaches and dynamic diagnostic and energy management control systems* that take a holistic view of building design, delivery and operations.” (CEESP, page 83)



Research and Technology Action Plan



- Essentially, the action plan is project management applied to a policy document. Tasks (“key actions”) are developed in coordination with stakeholders and industry experts to achieve milestones, and are the heart of the action plan.
- Project management tools are employed to:
 - a) identify groups already working on key issues related to the R&T Action Plan,
 - b) identify champions who can take responsibility for specific milestones,
 - c) estimate time to complete a specific action, and
 - d) Record progress to date.

Action plans have four main elements:

1. **Strategies** - An overview of the strategy and why certain actions are considered priority activities.
2. **Progress to Date (2010–2012)** - A graphical depiction of milestone progress, based on percent complete in the action plan.
3. **Action Plan (2010–2012)** - Identifies the milestones to achieve the strategy and has specific activities, is time bound and is aligned with champions in the industry.
4. **Priorities For The Future (2013–2030)** - Additional actions that were identified via stakeholders as potential strategies/milestones to include in an update to the Strategic Plan.

Research and Technology Chapter Strategies & Milestones

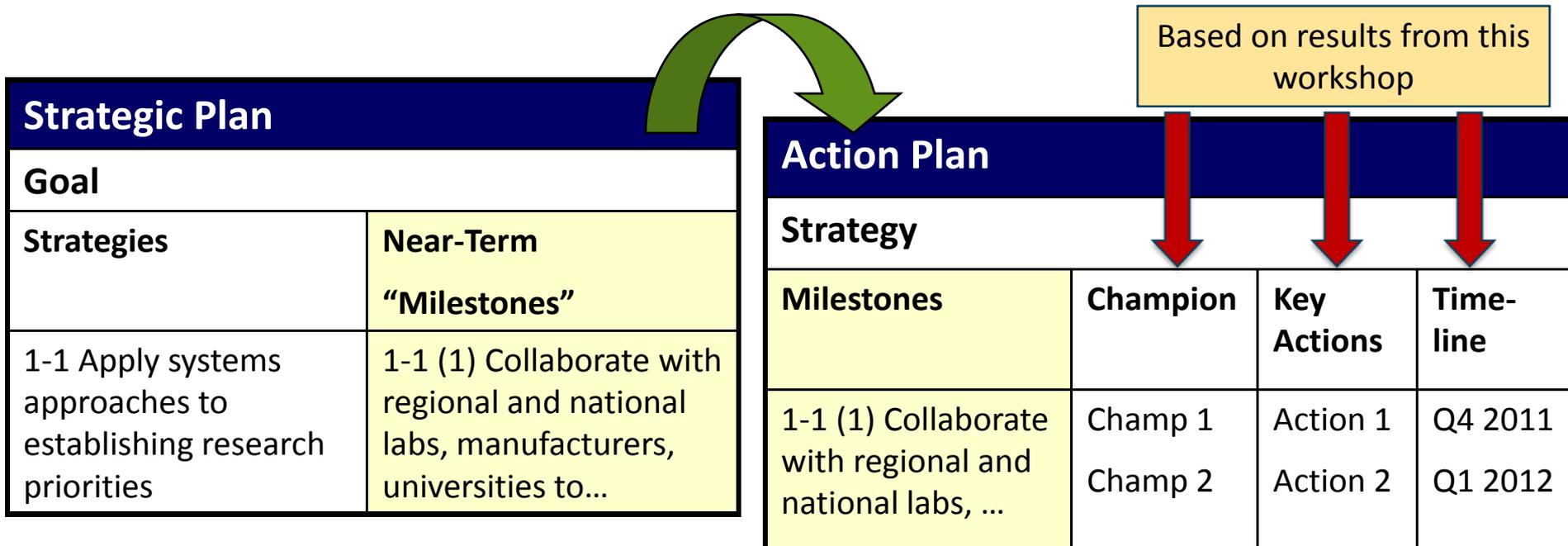
Goal 1: Create Demand Pull for New Technologies				
Implementation Plan and Timeline			Milestones	
Strategies	Near-Term	Mid-Term	Long-Term	
1-1 Apply systems approaches to establishing research priorities	1) .. 2) .. 3) .. 4) ..			
1-2 Leverage private industry and Federally funded technology research and investment	1) .. 2) .. 3) .. 4) ..			
1-3 Enhance market intelligence and behavioral research activities related to energy efficient technologies	1) .. 2) .. 3) .. 4) ..			
1-4 Expand activities to create market pull for energy-efficient technologies	1) .. 2) ..			

Research and Technology Chapter Strategies & Milestones (cont..)

Goal 2: Targeted R&D				
Implementation Plan and Timeline			Milestones	
Strategies	Near-Term	Mid-Term	Long-Term	
2-1 Develop general R&D community support for support Big Bold Initiatives	1) ..			
2-2 Promote cost-effective near-term performance enhancements of existing technologies	1) .. 2) .. 3) .. 4) ..			
2-3 Develop initiatives aimed at PIER to support large gains in support of Big Bold Initiatives	1) .. 2) ..			
2-4 Develop initiatives aimed at ET to support Big Bold Initiatives	1) .. 2) .. 3) .. 4) ..			

Research and Technology Action Plan Strategies, Milestones & Actions

- R&T Chapter includes two main goals. Each goal includes four different strategies
- There are total of 25 near-term milestones aligned with the various strategies
- There could be multiple of key actions and champions for each milestone
- Stakeholders can identify new key actions and/or key actions that have started (on-going) and/or completed during 2010-2012
- Stakeholders can nominate themselves as champions and/or nominate other individuals and/or organization, industry leads etc. as champions



- The R&T Action Plan will be designed to help California achieve the **Zero Net Energy (ZNE)** and **hot-dry climate HVAC technologies** goals (BBEES) described in the California Long-term Energy Efficiency Strategic Plan (CEESP).
- The R&T Action Plan will prioritize the key actions required to achieve the near-term (2010-2012) milestones of the R&T Chapter.
- The R&T Action Plan will address the following specific themes that are required to achieve the goals of the plan and the chapter:
 - *Process, Planning & Funding*
 - *Research & Development*
 - *Demonstration & Deployment*
 - *Consumer Acceptance & Information Dissemination*
 - *Market Research & Knowledge Management Systems*

Five Breakout Sessions After Lunch!



- 1. SESSION 1: PLANNING, PROCESS & FUNDING**
- 2. SESSION 2: R&D IN EXISTING & NEW/EMERGING TECHNOLOGIES**
- 3. SESSION 3: DEMONSTRATIONS**
- 4. SESSION 4: LARGE-SCALE DEPLOYMENT**
- 5. SESSION 5: CONSUMER ACCEPTANCE & INFORMATION
DISSEMINATION, AND KNOWLEDGE MANAGEMENT
SYSTEM & MARKET RESEARCH**

Note: We aligned the different milestones (given under different strategies in the Research and Technology Chapter) with the one of the five themes stated above.

Breakout Sessions

Sessions	Objectives	Facilitator
<p>(1) Planning, Process & Funding</p> <p>2nd Floor Fish Bowl</p>	<p>Align the research agenda of collaborating parties</p> <p>Leverage private industry & Federally funded technology research and investment</p>	<p>Virginia Lew (CEC/PIER)</p>
<p>(2) R&D in Existing & New/Emerging Technologies</p> <p>1st Floor, Hearing Room B</p>	<p>Target improvement in performance of existing technology</p> <p>Achieve breakthrough in advanced new technologies, whole building & integrated solutions</p>	<p>Rick Diamond (LBNL)</p>
<p>(3) Demonstrations</p> <p>1st Floor Resolution Training Room</p>	<p>Deploy incubators, pilots and demonstrations</p>	<p>Beth Chambers (CEC/PIER)</p>
<p>(4) Large-Scale Deployment</p> <p>1st Floor, Hearing Room A</p>	<p>Target product distribution and large scale market transforming strategies</p>	<p>Ayat Osman (CPUC/ED)</p>

Breakout Sessions

Breakout Sessions		
Sessions	Objectives	Facilitator
(5) Consumer Acceptance and Information Dissemination & Knowledge Management System and Market Research 1st Floor, Hearing Room A	Perform behavior research to encourage the adoption of emerging technologies Enhance market intelligence and knowledge	Ed Vine (LBNL/CIEE)

Breakout Sessions will not be available on WebEx

Expected Outcomes

- **Identify key actions to CEESP goals and strategies and timelines to achieve milestones**
- **Develop implementation recommendations**
- **Identify potential champions (individuals and/or organizations) to lead the implementation of the key actions**
- **Develop inventory of progress to date (if time allows)**
- **Prioritize additional strategies for the future (if time allows)**

First Panel: Planning, Process & Funding

- Laurie ten Hope (Director for Research & Development, CEC)
 - Gregg Ander (Chief Architect, SCE)
 - Susan Preston (General Partner, CalCEF Clean Energy Angel Fund)
1. What should be the process and/or effective strategies for identifying, planning and coordinating the Integrated Demand Side Management and Research, Development, Demonstration and Deployment (IDSMDDD) with key stakeholders to accelerate market adoption of ZNE technologies and practices necessary to meet CEESP goals?
 2. What should be the process for setting RDD&D investment/funding priorities?

Second Panel: Research and Development

- **Mary Ann Piette (Deputy of Building Technologies Dept., LBNL)**
 - **Mark Modera (Director WCEC, UC Davis)**
 - **Jerry Mix (Founder, WattStopper)**
1. What should the research priorities be in your area for the integration DSM and the R&D Agenda in California?
 2. Discuss key strategies to address the gaps in R&D to improve the performance of existing technologies and develop game changing technologies.

Third Panel: Commercialization (Demonstration, Deployment and Consumer Acceptance)

- **Bernie Kotlier** (Executive Director, Sustainable Energy Solutions)
 - **Benjamin Finkelor** (Executive Director, UC Davis EE Center)
1. Discuss key barriers and strategies for demonstration, deployment and market adoption of new/emerging technologies needed to advance the CEESP goal.
 2. Discuss key strategies to enhance market intelligence, information dissemination and consumer acceptance required to advance new/emerging ZNE technology adoption and market demand.

Contacts for Follow-up Questions/Comments

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California Public Utilities Commission

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Breakout Session Location (no WebEx)

Sessions	Objectives	Facilitator
(1) Planning, Process & Funding 2nd Floor Fish Bowl	<ul style="list-style-type: none"> Align the research agenda of collaborating parties Leverage private industry & Federally funded technology research and investment 	Virginia Lew
(2) R&D in Existing & New/Emerging Technologies 1st Floor, Hearing Room B	<ul style="list-style-type: none"> Target improvement in performance of existing technology Achieve breakthrough in advanced new technologies, whole building & integrated solutions 	Rick Diamond
(3) Demonstrations 1st Floor, Resolution Training Room	Deploy incubators, pilots and demonstrations	Beth Chambers
(4) Large-Scale Deployment 1st Floor, Hearing Room A	Target product distribution and large scale market transforming strategies	Ayat Osman
(5) Consumer Acceptance and Information Dissemination 1st Floor, Hearing Room A	<ul style="list-style-type: none"> Perform behavior research to encourage the adoption of emerging technologies Enhance market intelligence and knowledge 	Ed Vine