

CA | Energy Efficiency Strategic Plan

Zero Net Energy Vision: Commercial Building Action Plan

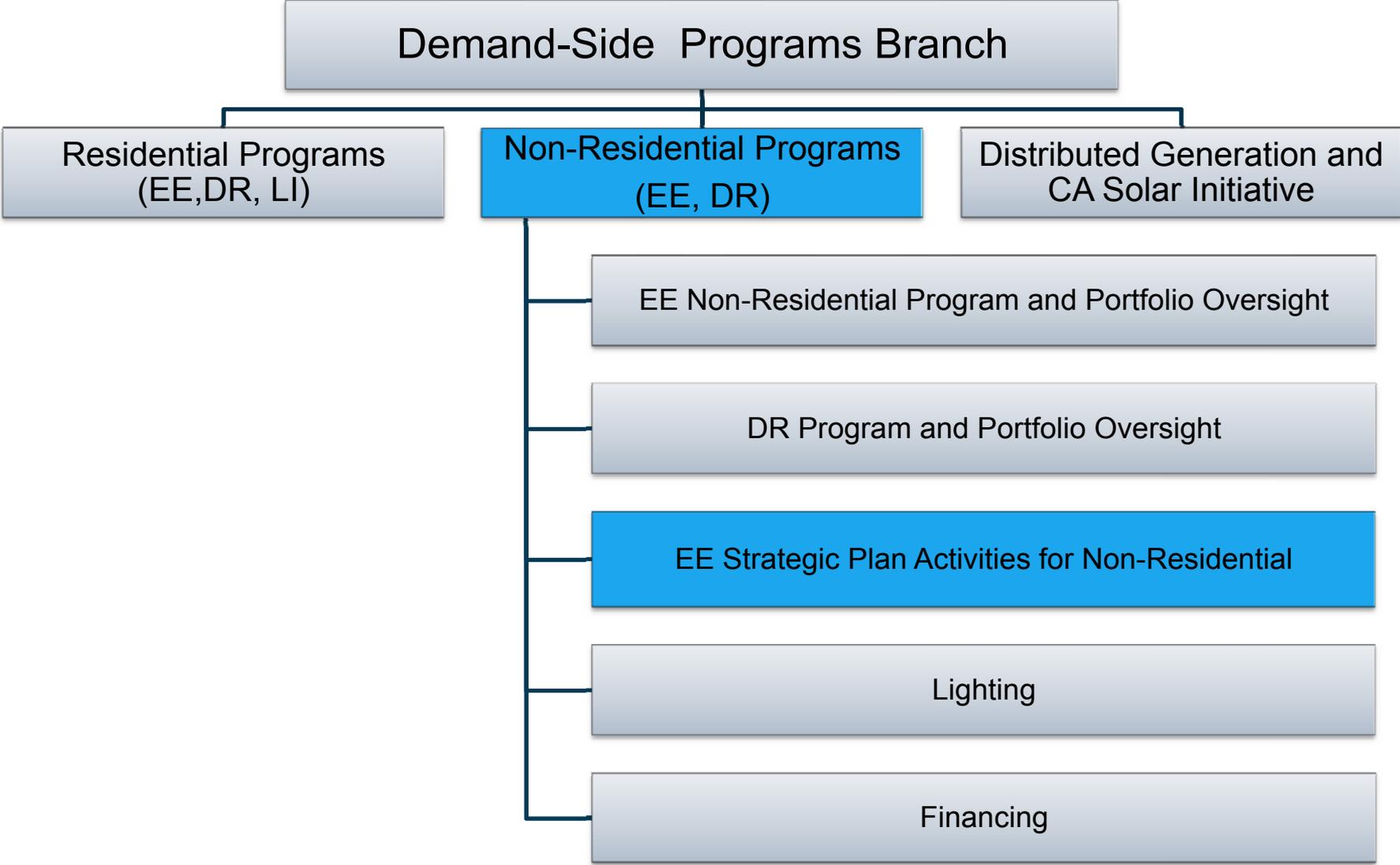
**IEPR Workshop on Achieving Energy Savings in California Buildings
July 20, 2011**

Jordana Cammarata, Energy Division
California Public Utilities Commission



- Strategic Plan and ZNE
- Strategic Plan Program Implementation
- Zero Net Energy Action Plan
- Q&A

ZNE Action Plan Activities

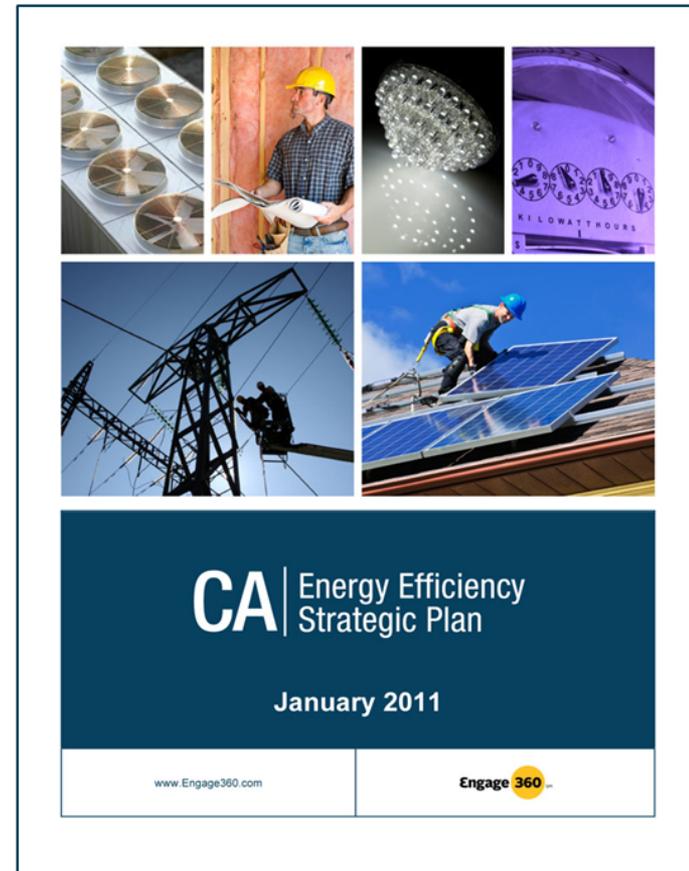


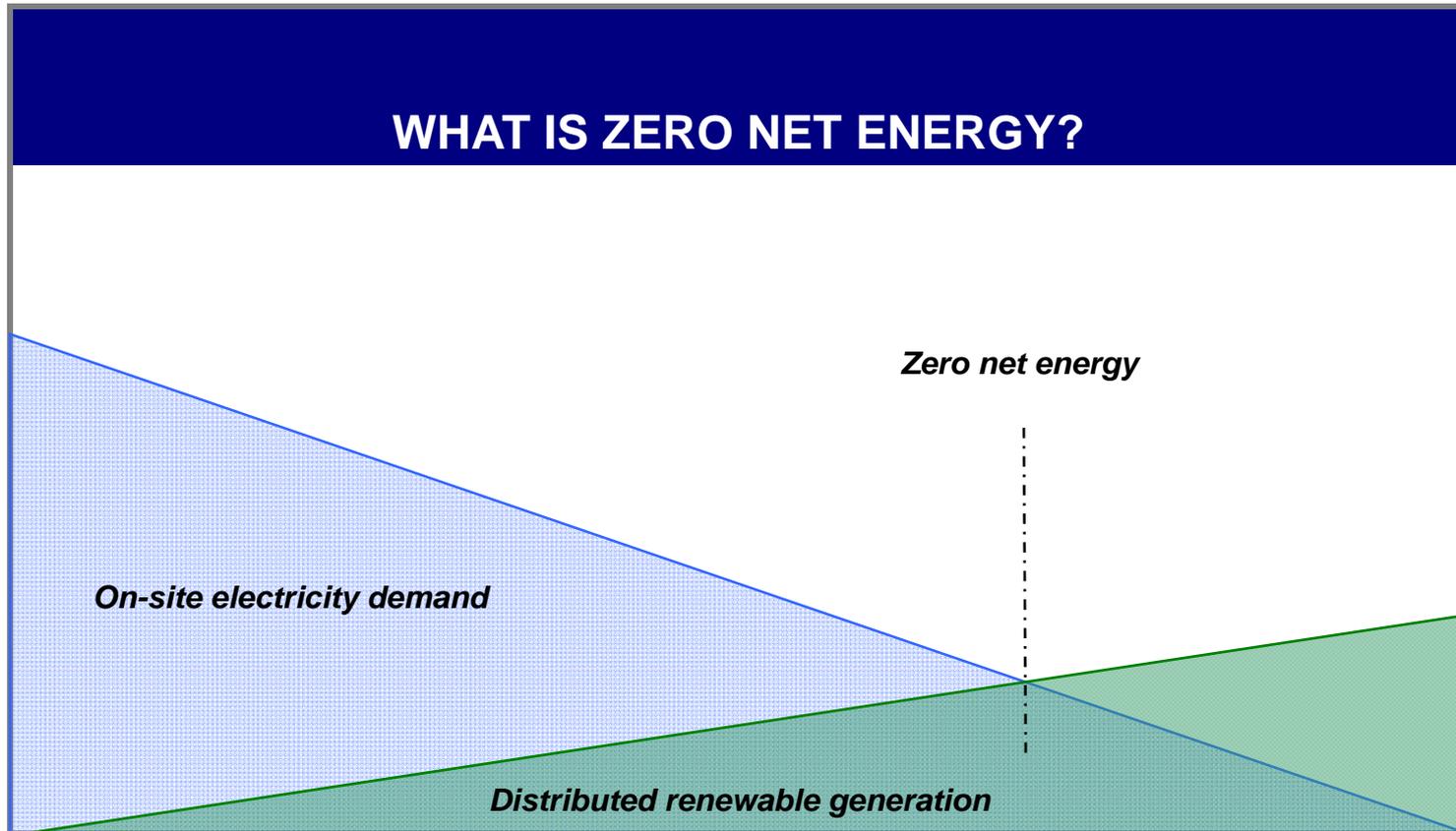
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THE STRATEGIC PLAN

Strategic Plan: ZNE Vision

- In 2008, Strategic Plan established – A roadmap for energy efficiency through 2020 and beyond
- Market Transformation
- Momentum via Action Plans
- Guided review of 2010-'12 IOU Programs





- The amount of energy provided by on-site renewable energy sources is equal to the amount of energy used by the building.

Strategic Plan: Big Bold Goals

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

Strategic Plan: Milestones

ZNE Commercial Buildings				
Strategies	Near Term 2009 – 2011	Mid Term 2012 – 2015	Long Term 2016 – 2020	2021 – 2030
Establish a long-term progressive path of higher minimum codes and standards.	Establish one- or two-tiered voluntary EE building standards.	Adjust the code on a triennial schedule on a fixed trajectory to ZNE by 2030.	RD&D and Title 24 updates	RD&D and Title 24 updates
Broaden Title 24 to address as many energy end uses as possible.	Adopt broader codes and standards to include plug loads and whole building approaches including metering and data management; automated diagnostic systems; and sub-metering for tenant-occupied space.	Develop and adopt progressively broader and deeper codes and standards.	Develop and adopt progressively broader and deeper codes and standards.	Develop and adopt progressively broader and deeper codes and standards.
Establish a “Path to Zero” Campaign to create demand for high-efficiency buildings.	Convene leading building industry associations to plan and conduct campaign.	Conduct Campaign	Conduct Campaign	Conduct Campaign
Develop innovative financing tools for ZNE and ultra-low energy <i>new</i> buildings.	Develop and pilot innovative financing tools.	Implement most effective funding mechanisms.	Expand Implementation of funding mechanisms.	On-going expansion of these options.

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Strategic Plan Program Implementation

Commercial IOU Programs 2010-2012 (New Construction)

Savings by Design

Budget - \$ 89 M

Electric (GWh) - 207,967,975

Electric (kW) - 47,879

Natural Gas (Therms) - 2,633,925

Innovative ZNE Pilots

PG&E ZNE Pilot - \$14 M

SCE & Sempra Sustainable Communities - \$ 10 M

SCE ZNE Tech Center - \$ 2 M

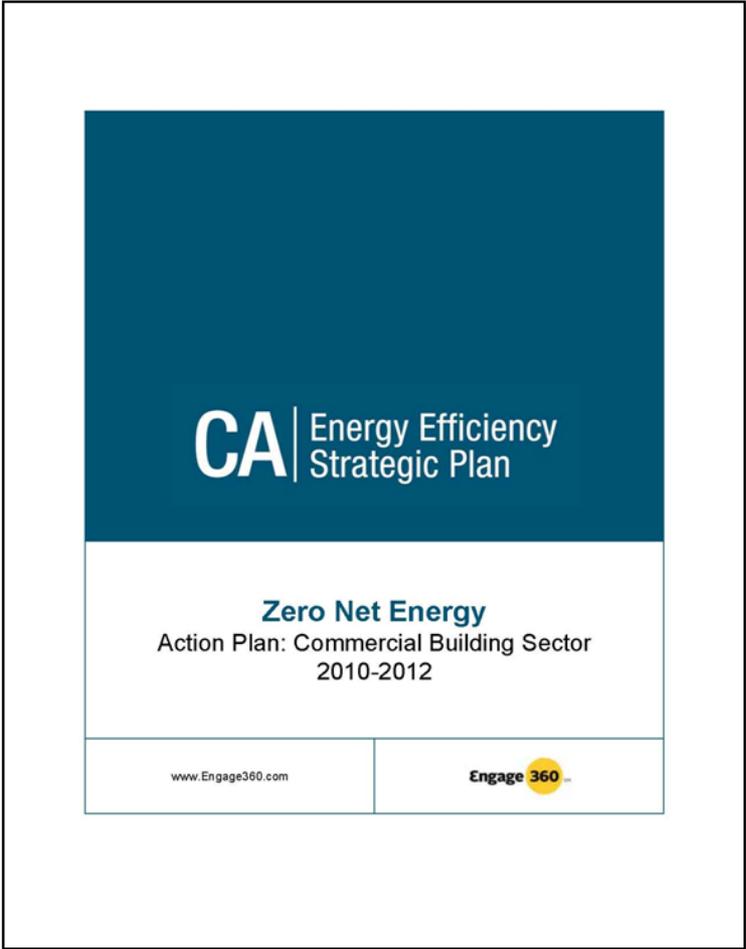
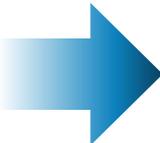
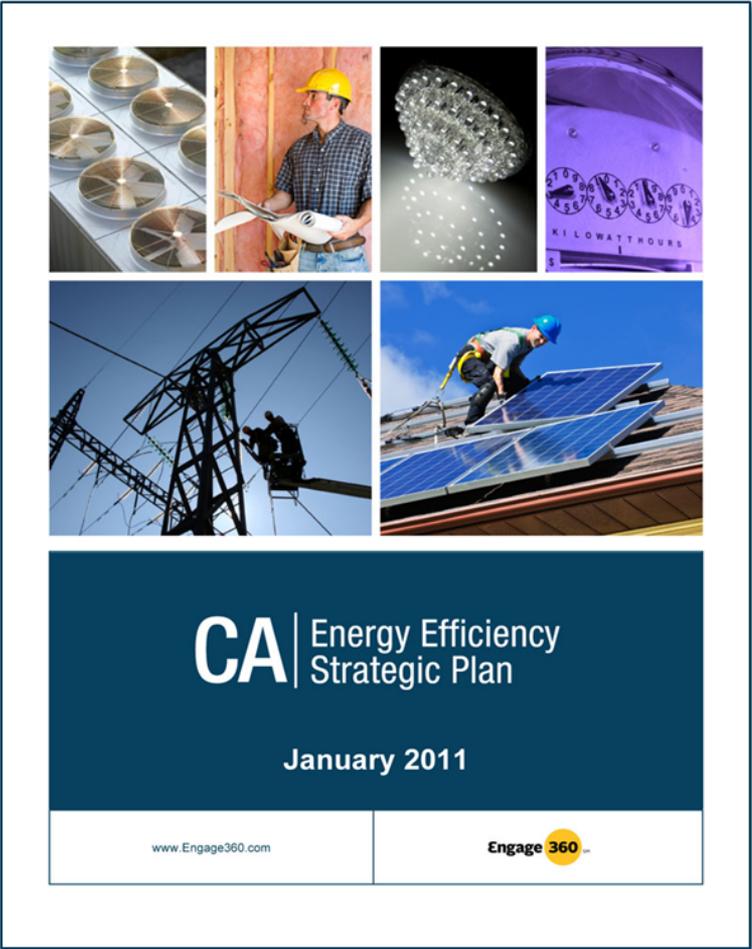
Investor Owned Utility ZNE programs

- PG&E ZNE Pilot Program -\$14 M
 - *Design and technical assistance*
 - *Monitoring and performance of demonstration projects*
 - *Best practices*
- SCE & Sempra Sustainable Communities - \$10 M
 - *Commercial and Residential*
 - *Master Planned Communities*
 - *Integrated Design*
- SCE ZNE Technology Center - \$2 M

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ZERO NET ENERGY ACTION PLAN

ZNE Action Plan



Moving to Zero Net Energy Buildings in California



California goals:

- 100% new commercial buildings are ZNE by 2030
- 50% of existing buildings are ZNE by 2030

Goal 1 – Six New Construction Strategies:

1. Establish a Path to ZNE Codes
2. Expand T20 and T24
3. Path to Zero Campaign
4. Develop Innovative Finance Tools
5. Create Investment Incentives
6. Advance the Practice of Integrated Design

ZNE Action Plan

Strategic Plan			
GOAL			
	Near-Term 2010-2012	Mid-Term 2013-2015	Long-Term 2016-2020
Strategy 1	Milestone		
Strategy 2			
Strategy 3			

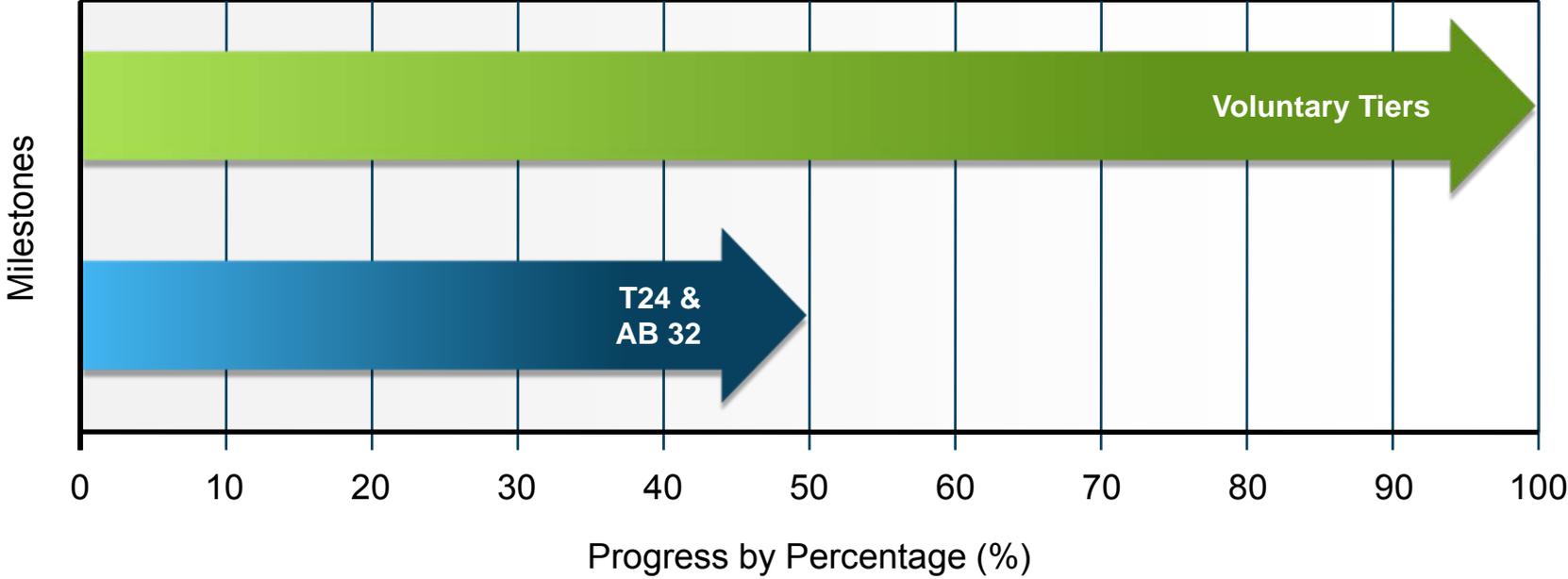


Action Plan			
STRATEGY			
	Champion	Actions	Timeline
Milestone 1	Champ 1 Champ 2	Action 1 Action 2 Action 3 Action 4	Q1 2011 Q2 2011 Q3 2011 Q4 2011
Milestone 2	Champ 1	Action	Q1 2012

- Strategy 1-1: Establish a Path to ZNE Codes

Milestone	Champions	Key Actions	Timeline
1-1-1 Establish one- or two-tiered voluntary EE standards, coordinated with green building rating systems	Patrick Saxton, CEC	Develop a green building code with multiple voluntary levels; Part 11 of Title 24 (California Green Building Standards Code)	Complete
	Pat Eilert, Pacific Gas & Electric Jon McHugh, McHugh Energy Consultants Inc	Develop a reach energy code that cities can adopt or utilities can incent beyond Title 24; Part 6 of Title 24 (California Energy Code)	Complete
1-1-2 Align Title 24 targets with goals of AB 32 and carbon reduction	Patrick Saxton, CEC	Coordinate policy development between Title 24 and AB 32	Ongoing
	Pat Eilert, Pacific Gas & Electric Jon McHugh, McHugh Energy Consultants Inc	Coordinate joint CEC/CPUC/California Air Resources Board (CARB)/California Independent System Operator (CAISO) actions to implement the AB32 Scoping Plan	Ongoing

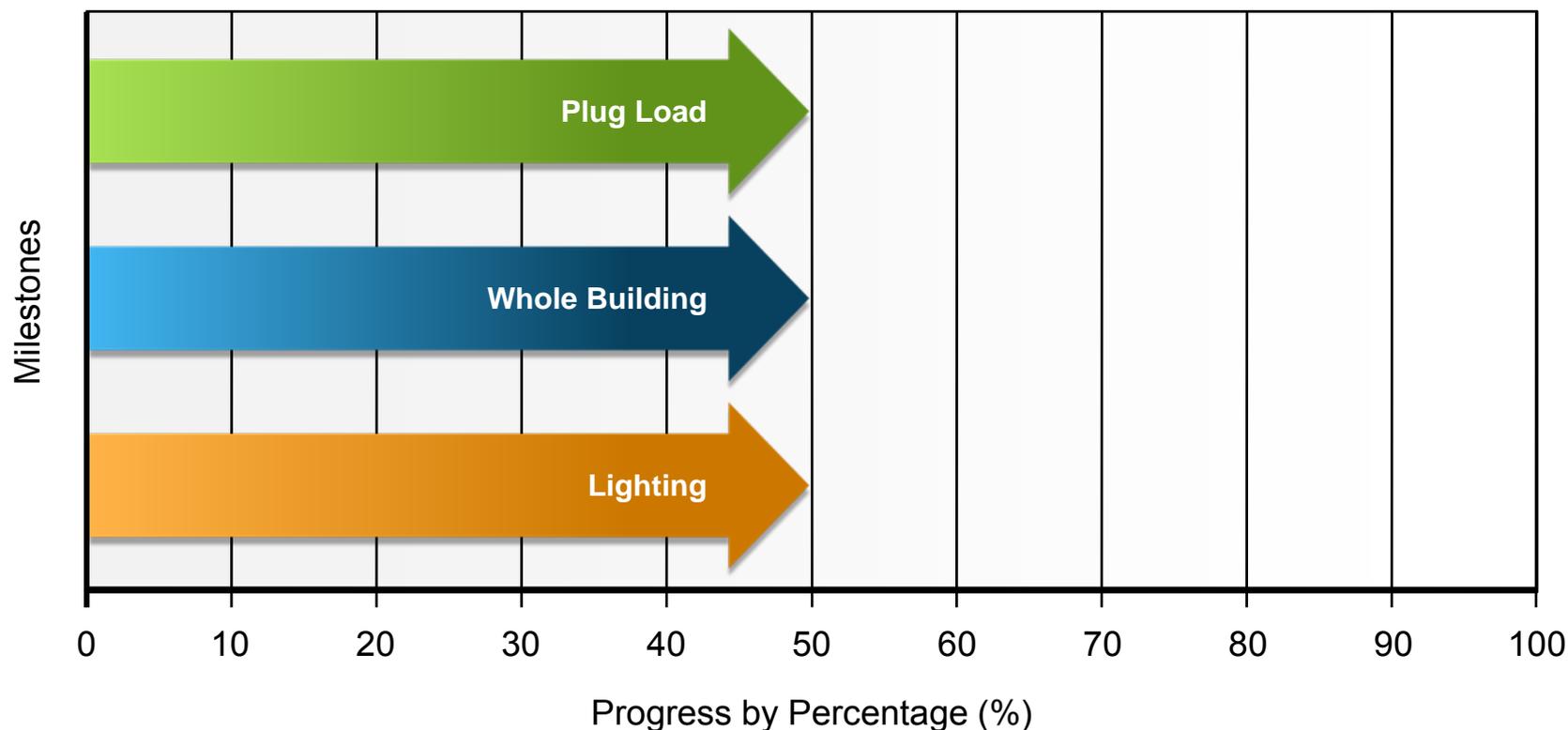
- Strategy 1-1: Establish a Path to ZNE Codes



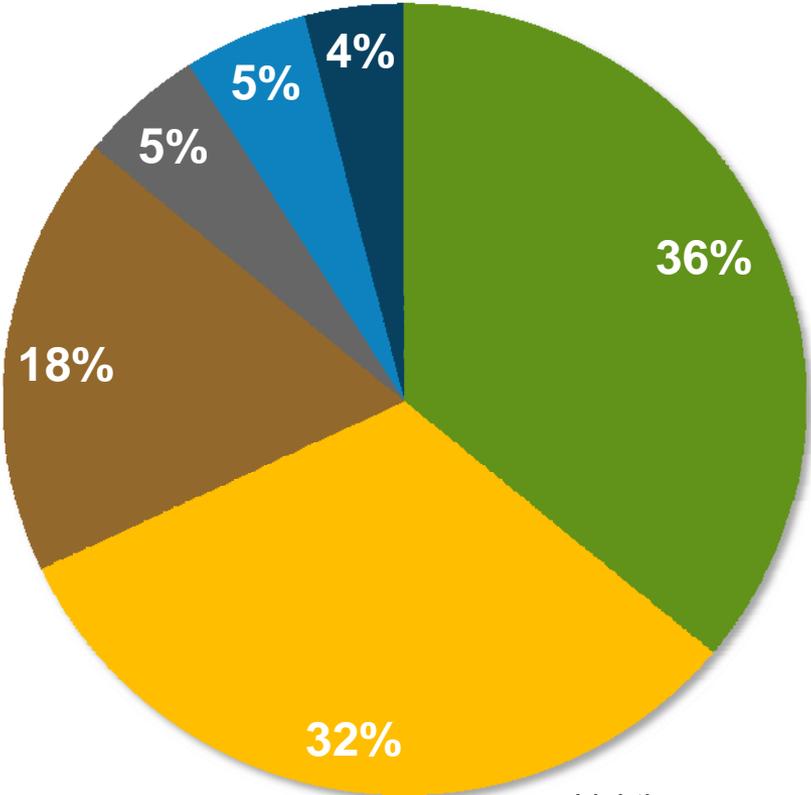
- Strategy 1-2: Expand T20 and T24 to Address All Significant Energy End Uses

Milestone	Champions	Key Actions	Timeline
1-2-1 Develop and adopt broader codes and standards for plug loads such as copiers, printers, battery chargers, televisions	Harinder Singh, CEC	Research new plug load efficiency opportunities; review/test costs and performance	Complete
	Brad Meister, CEC	Engage industry stakeholders on relevant changes to T20	Ongoing
	David Jacobowitz, Google	Develop case studies to substantiate costs, savings	Ongoing
	Pierre Delforge, NRDC	Propose/adopt changes to Title 20	Ongoing
1-2-2 Expand Title 24 to include whole building approaches including metering and data management, automated diagnostic systems and sub-metering for tenant-occupied space	Martha Brook, CEC	Research costs/benefits of metering, FDD systems and tenant sub metering for lighting, HVAC, and plug loads	Complete
	Randall Higa, Southern California Edison	Engage industry stakeholders on relevant changes to T24	Ongoing
		Develop case studies to document costs and benefits	Complete
		Propose and adopt changes to Title 24	Q1 2012

- Strategy 1-2: Expand T20 and T24 to Address All Significant Energy End Uses



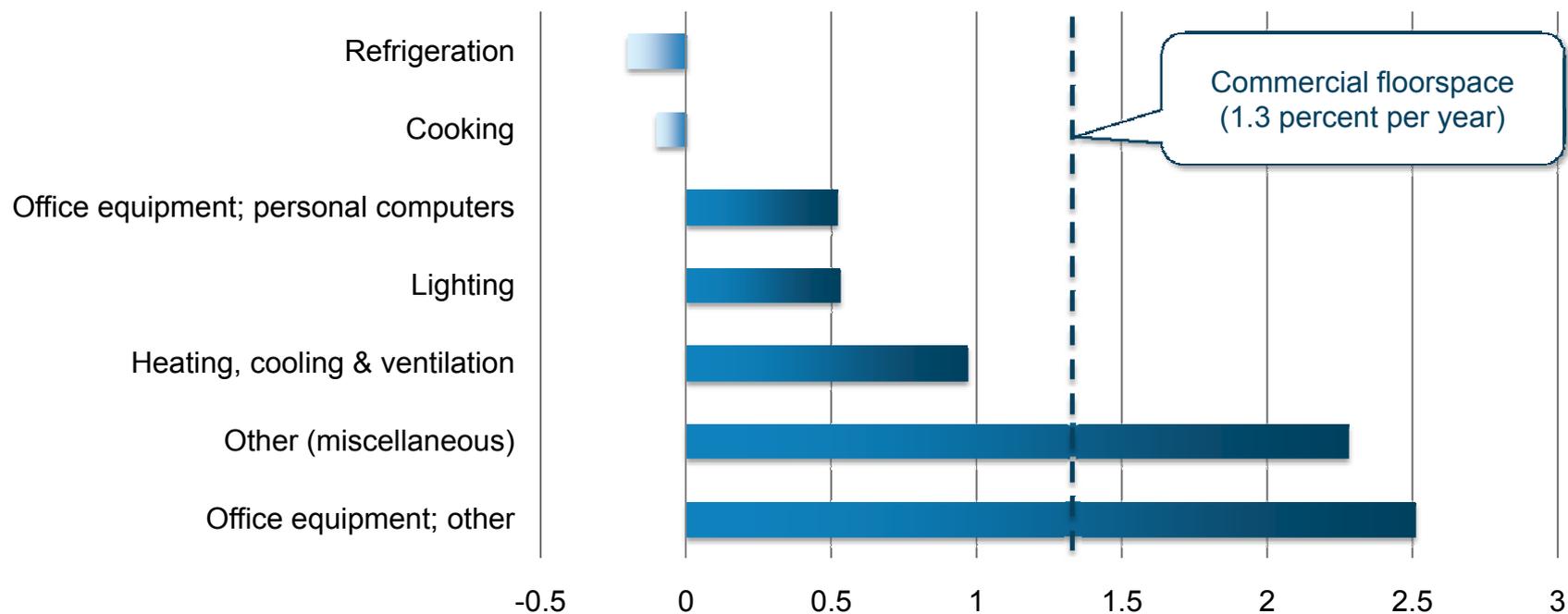
California's Office Electricity Consumption



- HVAC
- Office Equipment
- Water Heating, Refrigeration & Cooking
- Lighting
- Miscellaneous
- Compressors, Motors & Process

Electricity leads expected growth in commercial energy use

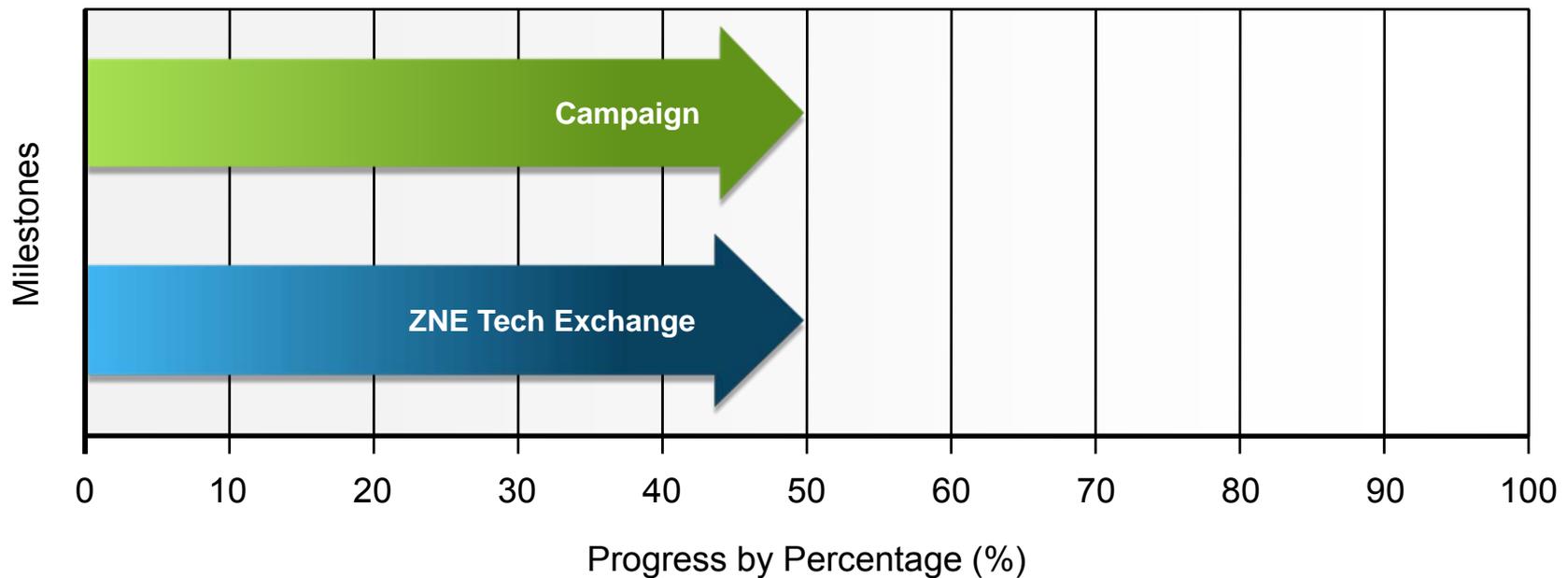
Average annual growth rates for selected electricity end uses in the commercial sector, 2008-2035 (percent per year)



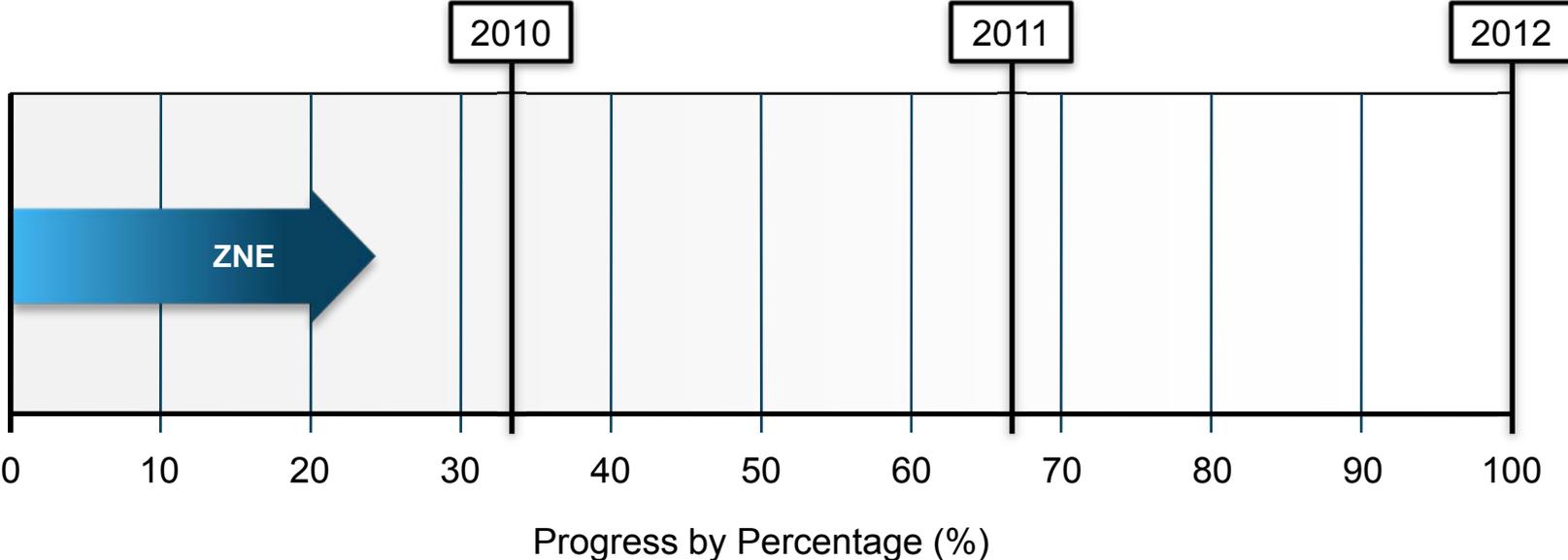
- Strategy 1-3: Establish a “Path to Zero” Campaign To Create Demand for High-Efficiency buildings

Milestone	Champion	Key Actions	Timeline
1-3-1 Convene leading building industry associations to plan and conduct campaign	Keri Bolding, Resource Media Shilpa Sankaran, ZETA Communities Kristin Ralff Douglas, CPUC	Convene series of stakeholder workshops	Complete
		Identify ZNE key audiences, drivers, attitudes, segments	Complete
		Develop outreach and education campaign plan (plus funding opportunities)	Complete
		Develop ZNE baseline study in key ZNE segments	Q3 2011
		Launch ZNE outreach and education campaign	Q1 2012
		Track and report on progress	Q2 2012
1-3-2 Organize forums to develop and exchange experience and data on emerging technologies, practices and designs that deliver ultra-low and ZNE buildings	Peter Turnbull, PG&E Gregg Ander, SCE RK Stewart, Perkins + Will	Convene regular forums involving key market actors, technical experts	Ongoing
		Record and inventory data and related emerging tech at forums; publish via Engage360.com, other online resources	Ongoing
		Survey forum participants re: best information for owners, architects	Ongoing
		Identify and craft ZNE best practices and technical guides; create a ZNE Mentorship program	Ongoing

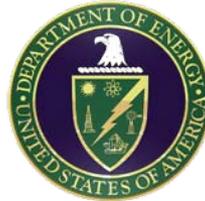
- 1-3 Establish a “Path to Zero” Campaign To Create Demand for High-Efficiency buildings



Overall Action Plan Progress



ZNE Action Plan



Key Drivers to ZNE Vision – New Construction

- Aggressive Codes
 - CALGreen and Reach Codes
 - Smart Meter and Demand Response
- Demonstration Projects and Design Contests
- Innovative Financing Tools
- Integrated Design

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Q&A

Thank you!

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Energy Efficiency website:

<http://www.cpuc.ca.gov/PUC/energy/energy+efficiency>

<http://www.engage360.com>