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Document Title:	Staff Presentation for Next EPIC Challenge Scoping Workshop
Description:	Staff Presentation for Workshop on Design-Build Competition for Zero-Emission Mixed-Use Development
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California
Energy Commission
Research & Development

The Next EPIC Challenge: Reimagining Affordable Mixed-Use Development in a Carbon-Constrained Future

Energy Research and Development Division

Housekeeping

EPIC Symposium

Tuesday, February 19, 2019
Beginning at 9:00 a.m.
(Registration begins at 8:00 a.m.)
Sacramento Convention Center
1400 J Street
Sacramento, California

To register, please visit the EPIC Symposium registration portal at http://2019epicsymposium.eventbee.com.

Workshop Purpose

- To present to stakeholders the Energy Commission's vision of The Next EPIC Challenge
- To solicit input from stakeholders on the proposed research objectives, technical requirements, and timeline
- To generate interest in this new funding opportunity and encourage early formation of partnerships

Policy and Market Drivers are Increasing Demand for Mixed-Use Development

- State policy aims to reduce GHG emissions from motor vehicles.
- Shortening distances between living, work, and commercial spaces can reduce vehicle miles travelled.
- Denser development can help offset high land costs and address California's housing shortage estimated at ~200,000 units per year.
- Demographics are driving demand for mixed-use environments.

State Policy is Shifting the Buildings Sector Towards Zero Emissions

- Assembly Bill 3232 (Friedman, 2018) directs the Energy Commission to develop a plan to reduce GHG emissions from buildings 40 percent below 1990 levels by 2030.

- Zero-emissions pathway exists for new, single-family home construction.

- Pathway for zero-emission mixed-use developments is uncertain
  - Higher energy use intensity
  - Limited roof space for generation
  - Commercial energy uses more difficult to electrify (e.g., food service)
  - More design variety

Opportunities

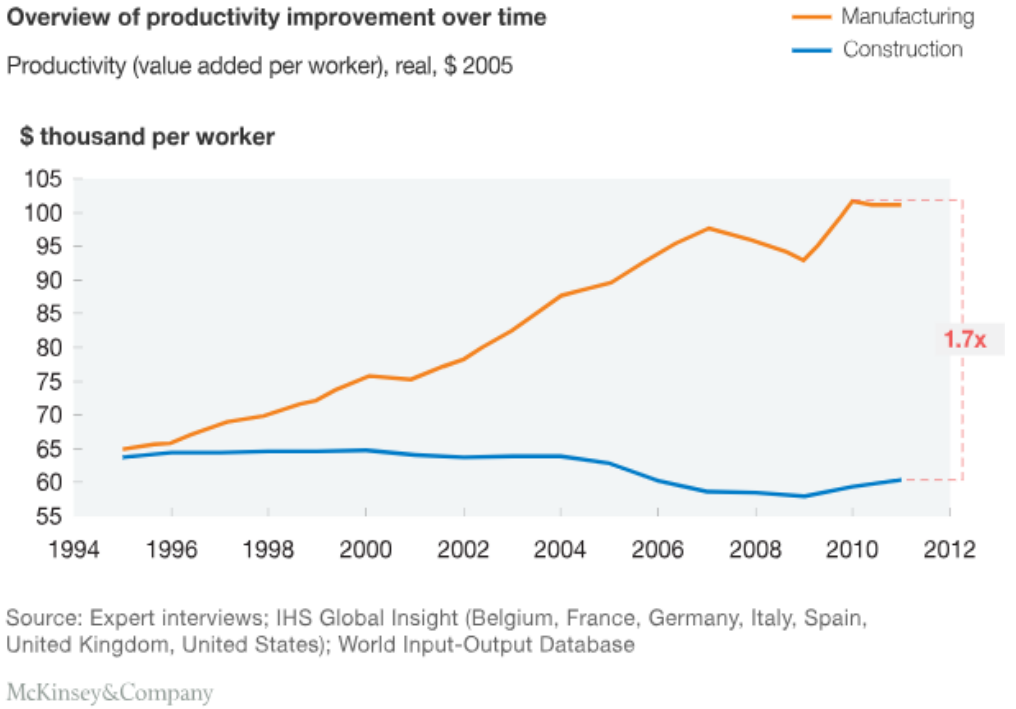
Energy Commission and US DOE Have Invested in a Number of Promising Technology Solutions

- These technologies have the potential to make zero-emission mixed-use development a realistic and viable option.
- The initial cost of these technologies will be more expensive until they are able to scale up production.
- Integrating these technology solutions into architectural, construction, and local permitting practices can deviate from standard practices.
- Long-term viability of the technologies and companies present risk.

Productivity in the Construction Industry Has Remained Flat

Construction productivity can be improved by:

- Modular design and standardization
- Improved onsite execution
- Digital planning and design tools
- Prefabrication and preassembly methods



The Need for Grid-Interactive Buildings Can Unlock New Revenue Streams

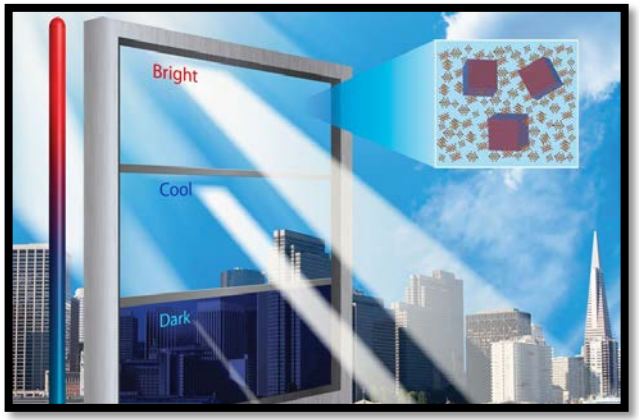
- High penetration of renewables requires buildings that harmonize and interact with the grid to reduce curtailment.
- Software solutions, regulatory frameworks, and tariff structures are being developed for grid balancing and flexibility services.
- These opportunities anticipate the future of distributed generation and markets that adequately support and compensate for grid flexibility.

Emerging Technologies For The Next EPIC Challenge: Generation

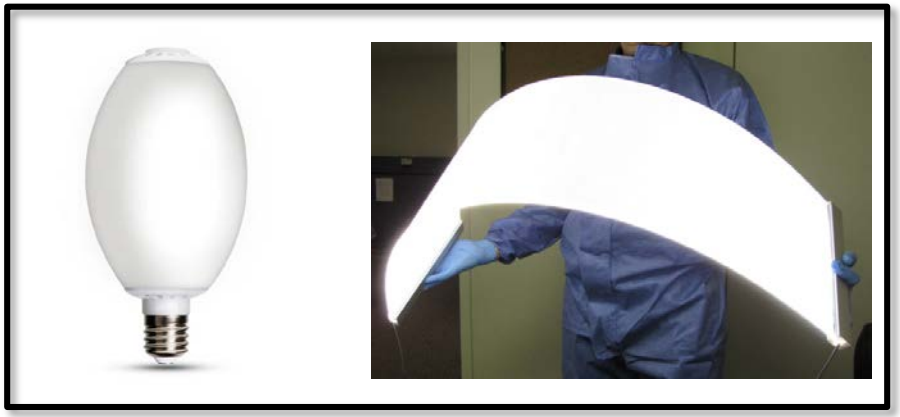
Thin-film/Tandem PV

Transparent PV

Emerging Technologies For The Next EPIC Challenge: Energy Efficiency



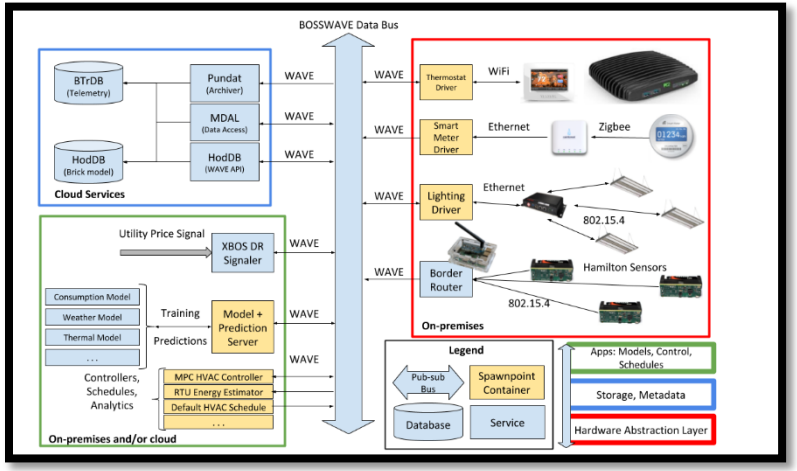
Smart Windows



Solid-State Lighting

Advanced Building Envelopes

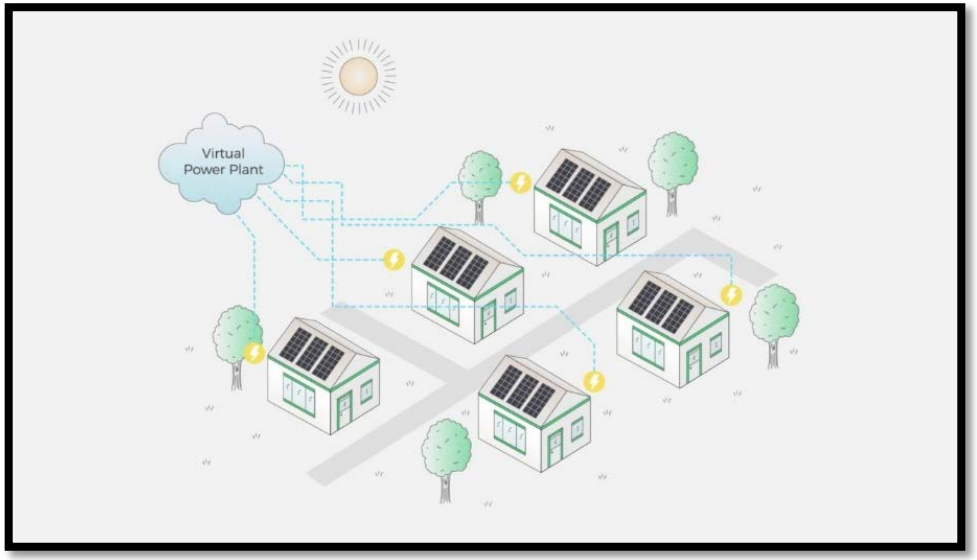
Proposed Emerging Technologies For The Next EPIC Challenge: Load Balancing



Building Automation Systems and Controls

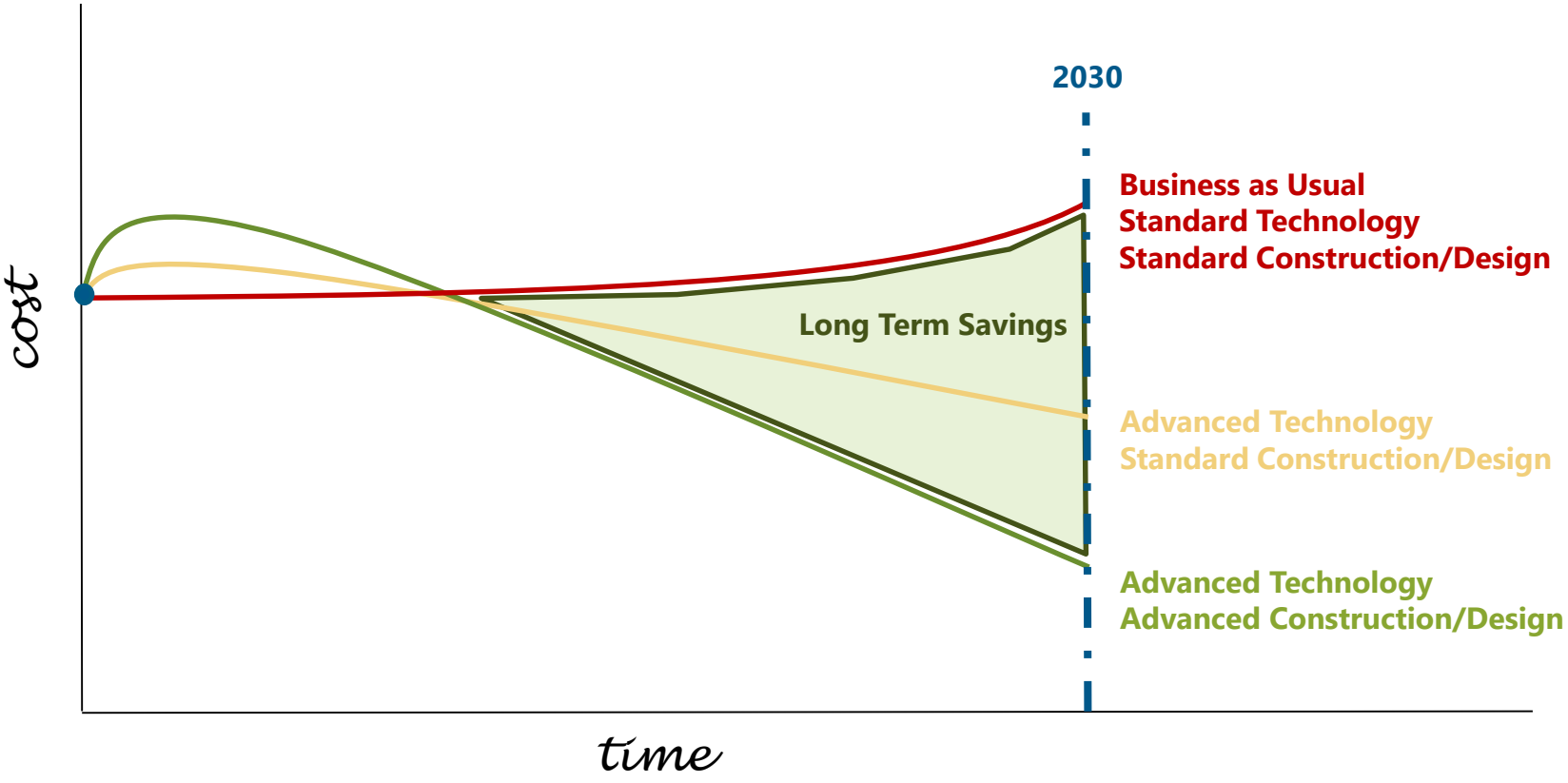
Smart Electric Vehicle Charging

Proposed Emerging Technologies For The Next EPIC Challenge: Load Balancing (continued)



DER Aggregation/Virtual Power Plant Platforms

Cost of Zero-Emission Buildings



Key Framing Questions

- Can we demonstrate that zero-emission mixed-use developments are technically feasible?
- To what extent can emerging energy technology solutions and innovative construction/design practices help offset additional costs of building and operating zero-emission mixed-use developments?
- Can we identify which advanced practices are ready to be made standard practice and accelerate their adoption? To what extent would these practices positively disrupt the industry?

The Next EPIC Challenge

- The Next EPIC Challenge is a two-phase competition that will challenge multidisciplinary project teams to design and build a mixed-used development concept capable of achieving zero emissions.

- Phase I is focused on the planning and design.

- Phase II is focused on the build-out.

Phase I: Design

- Phase I will provide $18 million for 2 groups:
  - Group 1: Northern California ($1.5 million each for 6 projects)
  - Group 2: Southern California ($1.5 million each for 6 projects)
- Projects must be located in a designated low-income or disadvantaged community in an IOU territory in CA.
- Anticipated project term: ~12-15 months

Commitment to Increasing Benefits to Low-Income and Disadvantaged Communities

- The Energy Commission continues to encourage underrepresented communities to engage in and benefit from our programs.

- As such, we commit to:
  - Allocate 25 percent EPIC TD&D funding for projects located in and benefiting disadvantaged communities.
  - Allocate 10 percent EPIC TD&D funding for projects located in, and benefiting, low-income communities.
  - Take into account adverse localized health impacts of proposed projects to the greatest extent possible.
  - Provide preference points or reserved funding for projects benefiting low-income and disadvantaged communities.

Phase 2: Build-Out

- Applicants that have successfully completed their Phase I projects will be eligible to apply for Phase II.
- Funding for Phase II will come from a future EPIC Investment Plan provided EPIC is reauthorized beyond 2020.
- Phase II will provide $30 million for 2 groups to build out their concepts from Phase I:
  - Group 1: Northern California ($7.5 million each for 2 projects)
  - Group 2: Southern California ($7.5 million each for 2 projects)
- Anticipated project term: ~4 years

Concept Vision

- New, zero-emission, mixed-use development (residential, office, retail)
- Single development project that encompasses roughly one city block
- Provides a minimum of 130 residential units - over 50% of these units must be designated for affordable housing
- Demonstrates emerging energy technology and advanced construction practices

Anticipated Project Teams

- Project teams could include the following:
  - Architectural firms
  - Developers
  - Electric utilities
  - Local governments
  - Community-based organizations
  - Energy technology experts

- Note: Architecture firms and developers may only participate in a maximum of two applications.

Networking Opportunities/Finding Partners

- LinkedIn Networking Webinar
- California Energy Innovation Exchange
  - Coming soon!
- California Energy Commission's Energy Innovation Showcase
  - http://innovation.energy.ca.gov/SearchHome.aspx

Proposed Schedule For The Next EPIC Challenge

Milestone	Date
Workshop	January 10, 2019
Comments on Next EPIC Challenge concept due	January 25, 2019
Solicitation Release	March 2019
Phase I proposals due	September 2019
Phase I projects begin:	February – March 2020
Phase I project complete:	April 2021
Phase II proposals due:	June 2021
Phase II completion	TBD

Request for Feedback

How Should “Zero Emissions” be Defined for this Challenge?

Staff proposes the following elements:

- No site emissions (i.e., all-electric, no on-site combustion)
- Onsite renewables offset development’s energy needs
- Criteria for flexibility and dispatchability (e.g., X% shiftable load) to significantly reduce peak demand of development and renewable curtailment on the grid

Additional factors considered:

- Embodied emissions in building’s construction and materials
- Transportation emissions from residents

What Other Technical Requirements Should be Considered?

Staff proposes the following elements:

- DC/AC hybrid infrastructure
- Master metering
- Interoperability with DER management platforms
- Pre-equipped with plug-and-play IoT platforms/building automation systems
- Power-over-Ethernet

What Advanced Construction Practices Should be Considered?

Staff proposes the following elements:

- Modular, repeatable designs
- Use of offsite prefabrication
- Advanced building materials
- Digital tools and automation
- Integrated planning tools
- Other innovations in the built environment or passive strategies

What Should Be the Most Important Criteria When Evaluating Phase I Proposals?

Staff proposes the following elements:

- Project proposes design strategies and technologies that are advanced, technically feasible, and likely to be replicated and scalable.
- Incorporates the specific needs of the community.
- Aligns with state and local policies for sustainable growth and affordable housing.
- Project team experience in advanced energy and building design.

What Deliverables and Milestones Should Be Required in Phase I to Be Eligible for Phase II?

- Conceptual drawings and design plans of a new, mixed-use development.
- Modelled energy performance of the building.
- Case study to document planning and design process.
- Description of emerging technologies to be used in the proposed build-out and why they were chosen.
- Analysis of the estimated cost of the chosen technology package at both the single development scale and at full production scale.

What Should EPIC Funds Be Used For In Phase II?

Staff proposes the following:

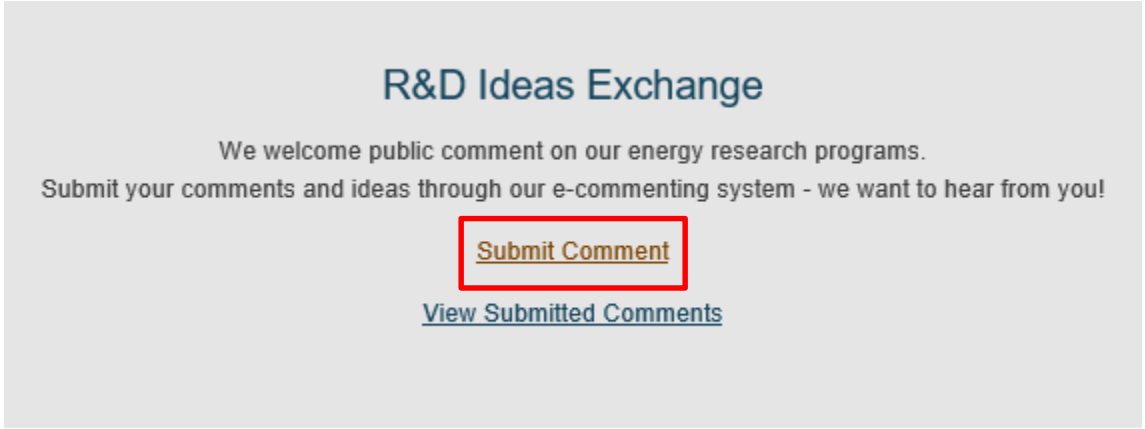
- Installed costs for emerging technologies
- Building management that can manage and operate a property with emerging technologies
- A percent of the installed cost may be used to warranty technologies

Additional Questions

- Please consider the organization of the solicitation (Phase I and Phase 2).
  - Is the proposed funding for each phase adequate to support the solicitation objectives?
  - Do the proposed project terms and solicitation timeline align adequately with mixed-use development and affordable housing timelines?

Comments Due on January 25, 2019

https://www.energy.ca.gov/research/



Questions?