



# Federal Utility Partnership Working Group Seminar

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# New Construction and UESCs

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# New Construction & UESCs

*The UESC statutory authority, 42 U.S.C. § 8256 (applicable to all federal agencies) and 10 U.S.C. § 2913 (applicable to DOD agencies) does not prohibit the use of UESCs in new construction.*

# New Construction & UESCs



Criteria for ECMs implemented in a UESC:

1. The measure must produce measurable energy or water reductions or measurable amounts of demand reduction
2. The measure must be directly related to the use of energy or water, or demand reduction
3. The preponderance of the UESC work (measured in dollars) must be for measurable energy or reductions or measurable amounts of demand reduction



# New Construction & UESCs



- Federal agencies may use a UESC, or leverage utility incentives, to finance or fund energy and water conservation measures that provide incremental energy efficiency improvements to a design for construction of a planned new building
- Construction of a structure may be viable within a UESC when it supports implementation, operations, or maintenance of the measure, (i.e., structure to house cogeneration system or carport PV)




# New Construction & UESCs



At a minimum

- Use the existing plan for the building
- Baseline (non-improved) building design and energy use must be agreed upon between the agency, utility, architect, and general contractor
- The baseline building must meet existing energy codes and standards (currently designed to meet ASHRAE standard 90.1-2016 code requirements)



A photograph of a construction site. In the foreground, several workers wearing orange safety vests and blue jeans are working with long metal beams on sawhorses. One worker is using a power tool on a beam. In the background, there are yellow scissor lifts and other construction equipment. The setting is a large, modern building with a glass and metal facade, with a high ceiling and large windows. The overall scene is busy and industrial.

# Executive Order 13834

## Efficient Federal Operations

*Agencies are to ensure that new construction and major renovations conform to applicable building energy efficiency requirements and sustainable design principles.*



# Executive Order 13834



Guiding principles for new construction:

- Think about EV charging needs – stub it up!
- 30% better than ASHRAE
- Incorporate renewable energy
- Maximize daylighting, use dimming controls, task lighting, etc.
- Use energy efficient products

*The above can be incorporated in UESC projects!*

# New Construction – The Process



**1**

The utility “audits” the baseline design, through simulation in conjunction with review of any baseline equipment and building material selections.

**2**

The utility suggests more energy efficient materials and systems (e.g., chillers, air handling units, windows and wall insulation) and incremental costs and savings are calculated.

**3**

The estimated savings represented by these differential costs are used to pay for the UESC.

**4**

Once the building is constructed and accepted, the utility is paid from the incremental savings of all energy efficiency upgrades to the baseline design.





# Become a Beyond the Building Code Thinker!

(or even a Net Zero Thinker!)

*This can be accomplished through UESCs (or utility partnerships). We have living, validated proof that such buildings can exist when partners are “Total Comprehensive Thinkers.”*



# Beyond the Building Code



DOE's National Renewable Energy Lab partnered with Xcel Energy in designing the Energy Systems Integration Facility (ESIF).

ESIF was designed to accelerate the commercialization and adoption of renewable energy and energy efficiency technologies through public and private partnerships.



# Case Study – Quick Facts



- **Location:** DOE-NREL Energy Systems Integration Facility (ESIF), Golden, CO
- **Utility Partner:** Xcel Energy
- **Project Cost:** \$596,486
- **Utility Rebate:** \$259,915
- **Payback:** 1.32 years



## Case Study – ECMs



- 90% waste heat recovery (heat source for offices and labs)
- Direct liquid cooling to high power servers
- Solar PV
- Thermal water loop
- Daylighting (as much as 100% much of the year)
- High efficiency air handling
- Ventilation through under-floor air distribution system
- Natural ventilation
- Solar powered fans



## New Construction and Utility Partnerships Best Practices:

- *Encourage early collaboration between agency, architect, and utility*
- *Allow energy efficiency to guide the design architecturally to be as efficient as possible*
- *Take advantage of available incentives and rebates*
- *Designing beyond code results in savings for performance contracts*



Form a team of  
*Total  
Comprehensive  
Thinkers!*



**Thank You!**

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