DOCKETED	
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Project Title:	2022 Energy Code Pre-Rulemaking
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Document Title:	Noresco Slides on High Rise Residential Electric Baseline presented on October 6
Description:	This document is the slide presentation given by Noresco at the October 6 workshop on the topic of an electric baseline for high rise residential buildings within the Energy Code.
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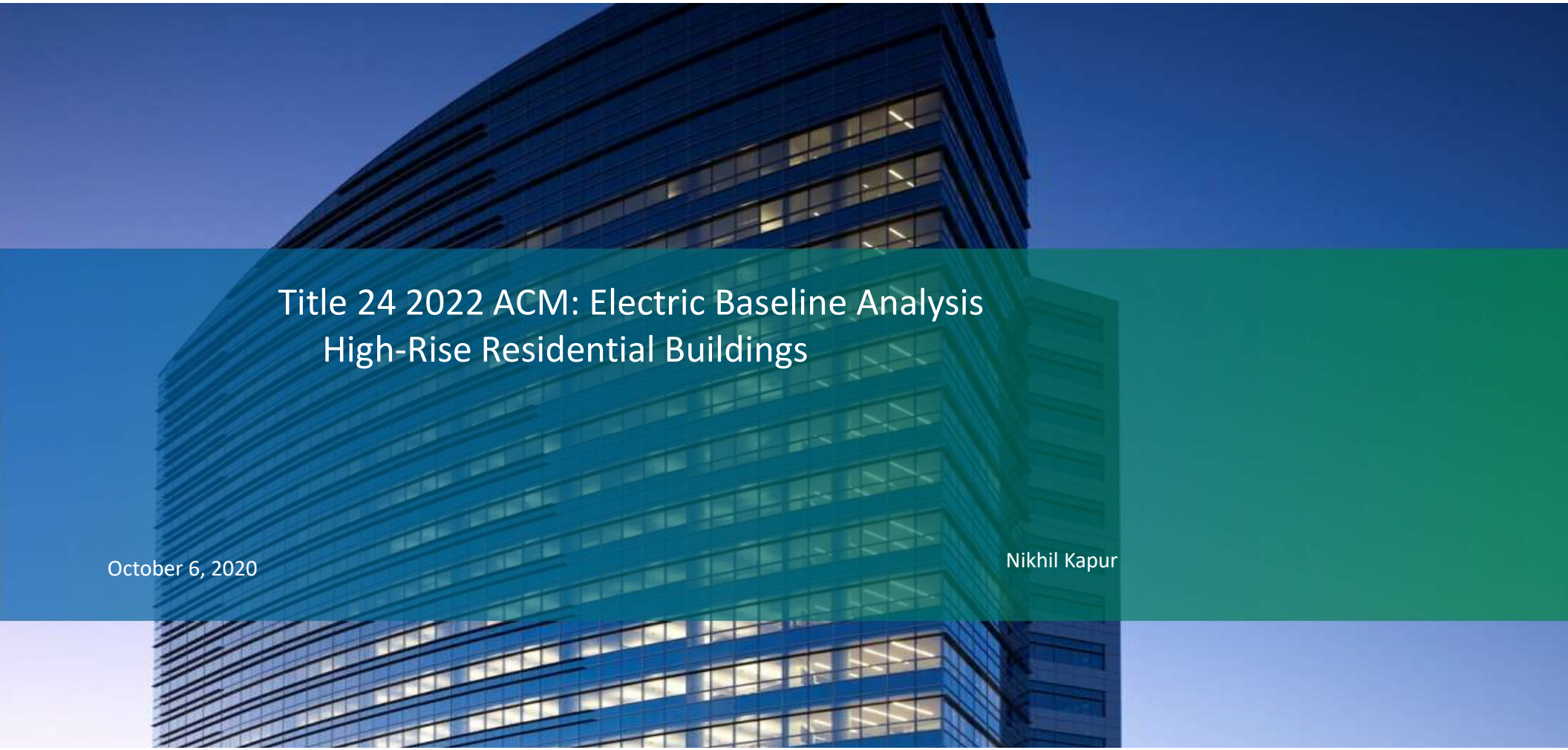

Title 24 2022 ACM: Electric Baseline Analysis
High-Rise Residential Buildings

October 6, 2020

Nikhil Kapur

NORESCO

OBJECTIVES

- Identify all-electric HVAC systems for consideration as 2022 ACM Baselines
- Evaluate performance relative to current ACM Baselines
  - All current baselines use gas heat
  - TDV expected to increase when switching to electric heat
- Improved glazing options also considered for inclusion

APPROACH

- Use CEC prototype
  - 10 Story High-rise Residential
- Service and Domestic Hot Water Systems – Electric Only

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ELECTRIC BASELINE SYSTEM OPTIONS

	Current Baseline	Systems Analyzed
Highrise Residential Dwelling Units*	Single Zone Air Conditioner with Gas Furnace Heat	▪ Single Zone Heat Pump ▪ Single Zone Heat Pump w/ Gas Supplemental Heat ▪ Variable Refrigerant Flow ▪ Water Source Heat Pump w/ Elec. Boiler
Ventilation	Balanced Ventilation	Balanced Ventilation

*HVAC systems for nonresidential spaces were modeled to match the baseline for all options

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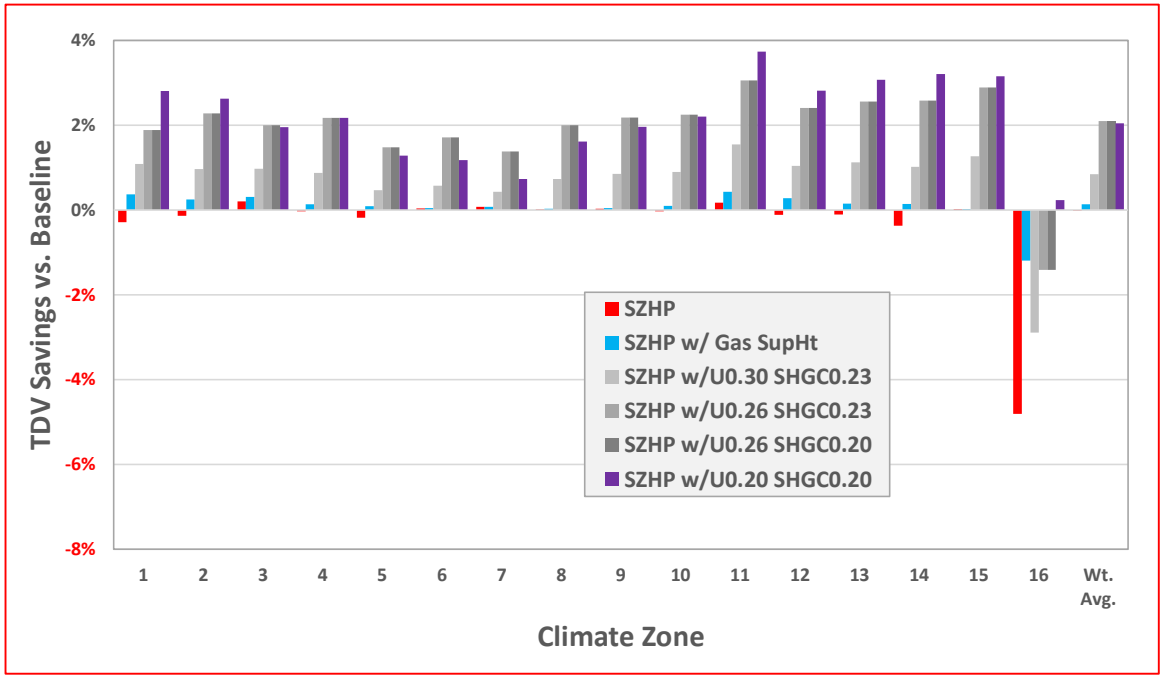
RESULTS

High-Rise Residential

- Baseline is Single Zone Air Conditioner (SZAC) with gas furnace
- Heat pump gives TDV results close to baseline, but negative savings in many climate zones
- Switch to gas supplemental heat provides TDV savings in all zones except CZ16
- SZHP with improved glazing, particularly lower U-factor, can achieve savings in all climate zones



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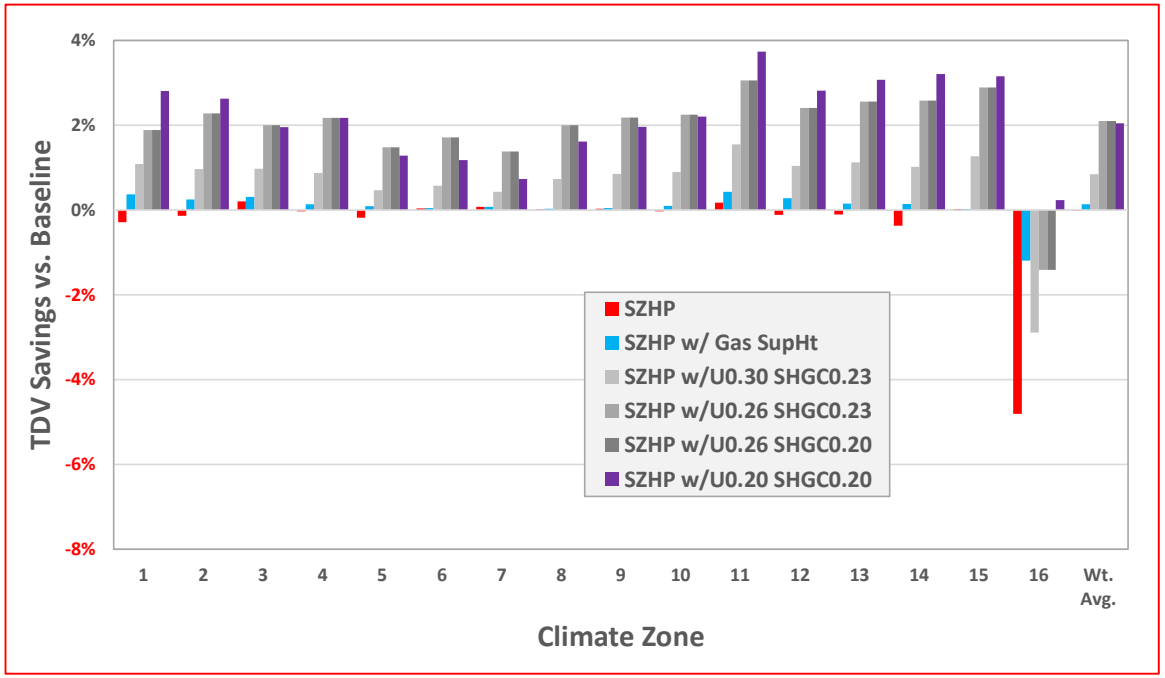
RESULTS

High-Rise Residential

- Heat pump with electric supplemental heat in all climate zones
  - U-Factor 0.36 glazing (current baseline) in CZ3, 6, 7, 8, 9, 11 and 15
  - U-factor 0.30 glazing in CZ1, 2, 4, 5, 10, 12, 13, and 14
  - U-factor 0.20 glazing in CZ 16
- Alternatively for CZ16, gas supplemental heat and U-factor 0.30 glazing



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