

Panel 5: Insights from Utilities and Implementers: Programs and Perspectives on Thermal Energy Storage

Moderators:

Dr. Helia Zandi, Modeling & Simulation SW Engineer, ORNL

Dr. Marco Pritoni, Research Scientist, LBNL

Stor4Build Annual Meeting

August 26–27, 2024

Oak Ridge National Laboratory

NREL/PR-5500-91060

Justin Hill, PhD, PE

Principal Research Engineer | Storage & Use R&D, Southern Company

PhD in Interdisciplinary Engineering – UAB, 2017

BS & MS Mechanical Engineering – Univ. of Alabama, 2009/2011



Research & Project Summary

- Demand Flexibility technology development & grid integration
 - Georgia Power Smart Neighborhood (Connected Communities)
 - GT Flex/Tide Flex (Campus Load Flexibility Demos)
 - Project DIBS (BESS, Solar & Building Automation grid integration)
- Demand Flexibility Utility Modeling
 - Find full value of load flex in Prod. Cost & Reserve Margin Studies

Work History

2012-now: Southern Company Research & Development

2011-2012: Southern Nuclear – Vogtle 3&4



Bryan Boyce, PE

Associate Director, Engineering

BS ME, Tufts University, 2007

MS ME, UC Berkeley (thermal sciences and combustion), 2008

Energy Solutions, 2013 – present

Waste Heat Thermal Energy Storage Market Transformation

Intent is to achieve market transformation around waste heat TES+HR in large nonresidential buildings. We see a future where TES is specified by default along with chillers & cooling towers.

- CalNEXT field demonstration for CW TES (partnering with Taylor Engineers), including case study and design guide
- CalNEXT deemed measure development for hydronic HR retrofits
- Title 24 CASE measures aimed at encouraging TES+HR in new construction
- Title 24 code compliance software (CBECC) features to capture TES+HR designs (including EnergyPlus enhancements)



Silvia Khurrum, MS, MBA

Education

- BS in Mechanical Engineering, Universities in Slovakia and Denmark
- MS in Mechanical Engineering, Manhattan College, New York
- MBA in International Business, Fordham University, New York

Profession Experiences

- 20 years of experiences in Energy Industry
- Staff Management, Engineering, Operations, Performance of Power Generation
Management of Utility Demand Response and Customer Sited Pilots
- Development and Demonstration of Cutting-Edge Clean Energy Technology for Building
Decarbonization, Electrification and Lowering Buildings' Emissions and Energy Use

Industry Engagement

- Vice Chair at Building Energy Smart Technologies Center (BEST)
- Chair for Demand Side Management for CEATI
- Board Member of Clean Energy Business Incubator
- Technical Advisor for EPRI/ GTI Low Carbon Resources Initiative
- Utility Advisor for EPRI Program: Advanced Buildings and Communities
- Guest Speaker at NYU and Columbia University



**Project Manager, Building
Decarbonization, Research and
Development, Con Edison**





Stan Nabozny, Director of Thermal Energy Consulting manages market development, engineering, cost estimating and commissioning for Michaels' thermal energy storage (TES) programs. He holds patents in TES using phase change materials and has eleven years of experience in designing, sourcing, and deploying TES in multiple countries. Stan's focus to date has been TES for industrial refrigeration, shifting load off-peak, and saving energy. He leads Michaels' load management portfolio for TES in refrigeration and HVAC, as well as monitoring-based commissioning.

Energy Consulting

INC 5000 Company
14,500+ energy and load management projects in 40 years, 3,600 Gigawatt hours and 81 M. therms of savings. Team of ~130 staff members and building experts, >50% engineers.

TES for Refrigerated Facilities (44GW in the US)

- A “convective” Thermal Battery stores and absorbs 300x more heat per pound than frozen food
- No mechanical components, no heat exchangers, no piping
- Refrigeration equipment turned off during the expensive part of the day to shift load and save energy
- Does not occupy operational space
- Qualifies for a 40% ITC tax credit
- Manufactured in California
- Lowest cost LDES battery (BloombergNEF, May 2024)

