U.S. DEPARTMENT OF ENERGY

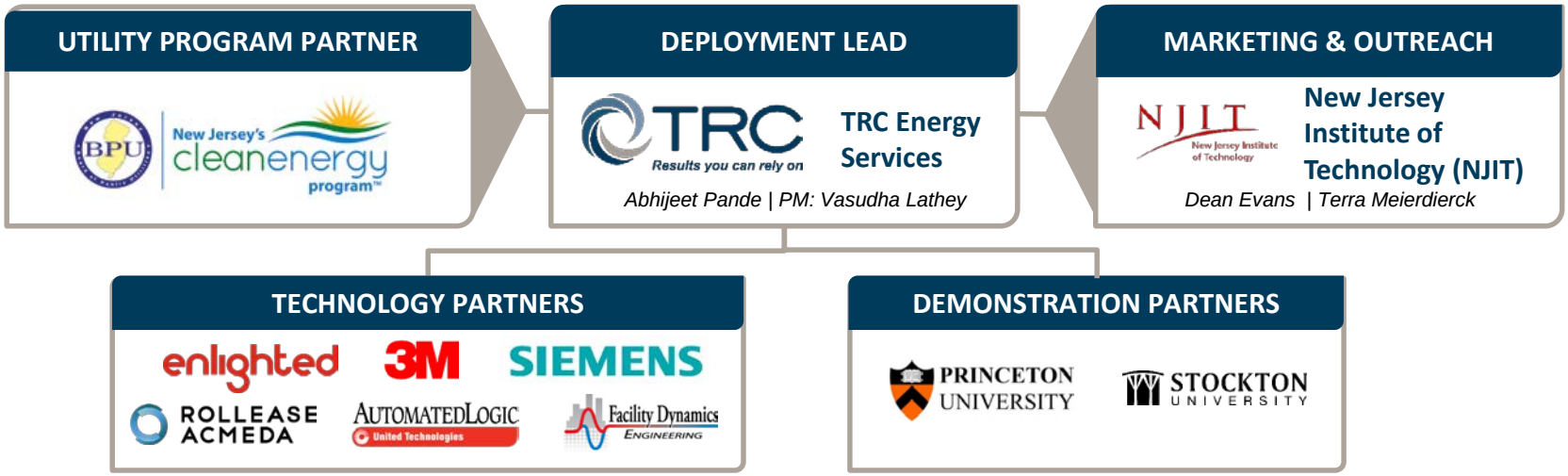
Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Integrated Solutions for Optimized Performance (ISOP)

TRC Energy Services – New Jersey Institute of Technology (NJIT)
Abhijeet Pande, Associate Vice President; Apande@trcsolutions.com
Vasudha Lathey, Director; Vlathey@trcsolutions.com

Integrated Solutions for Optimized Performance (ISOP)

ISOP Project Team



- Unique combination of diverse capabilities (building science research, emerging technology validation and market outreach)
- Utility partners and university campus demo partners offer a unique opportunity for scalability and replicability of the ISOP package

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The Problem (The Need/Challenge)

Problem Definition:

- Conventional building retrofit projects focus on individual technologies and/or products and are not designed to optimize the building performance as an integrated system- therefore missing deeper energy saving opportunities

Advice:

- Unlocking the potential of deep whole building retrofits by design, deployment and evaluation of integrated replicable and standardized packages that combine multiple technologies and smart communicating controls to maximize energy efficiency.
  - ISOP Technology Package technologies address energy use across multiple building end uses that represent >60% of the energy consumption in all commercial buildings

BUILDING TYPES	ANNUAL CONSUMPTION (Tbtu/Yr.)	ISOP SAVINGS POTENTIAL (%)	ISOP TOTAL
Education	842	20%	165
Office	1,241	22%	273
Warehouse	429	24%	103
Lodging	564	13%	71
Healthcare	718	18%	130
Public Safety	133	17%	23
		TOTAL POTENTIAL SAVINGS	**765**

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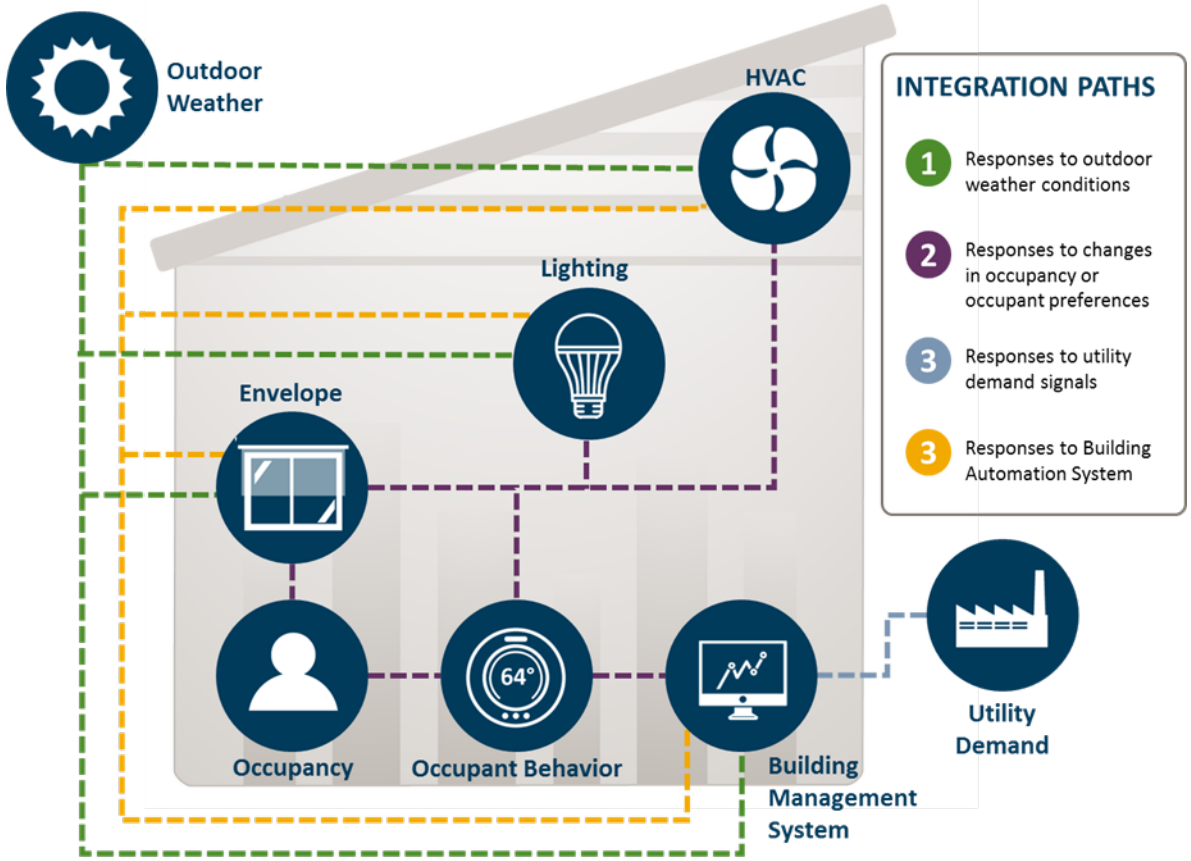
The Solution

I. Advanced lighting & controls

II. Daylight harvesting through automated self-powered shades and window films

III. HVAC controls upgrade and advanced controls sequences (ASHRAE Guideline 36)

IV. Fault detection and diagnostics (FDD) and continuous commissioning (Cx) using advanced analytics



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Each demonstration site will integrate at least two measures and validate savings through measurement and verification (M&V) 2.0 protocols.

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	CURRENT MARKET STATE	PROPOSED INNOVATION
Lighting	Increasing adoption of LED's but lost saving opportunities due to lack of integration with other building systems	**Enlighted** combines the advanced LED' and aggressive controls strategies integrated with the HVAC operations
Daylight	Not typically a focus of existing building retrofits and rarely integrated with HVAC	Integration of **Rollease** shades and **3M** window films with lighting and HVAC provides an easy and cost-effective method of optimizing daylighting and energy use with minimal operational disruptions.
HVAC	Lack of standardized control sequences results in software, hardware, and human error deficiencies that result in energy wastage.	**ASHRAE GDL36** offers standardization of controls sequences based on industry best practices that reduce cost and operational errors
Cx & FDD	Rarely used in buildings	Sophisticated analytical techniques analyze building operations, diagnose and prioritize system faults for efficient decision-making.
M&V 2.0	Limited market availability	Automated **M&V 2.0** will streamline the savings estimation process, provide continuous feedback for operational efficiency, and provide performance validation results for future utility program

Thank You

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