Improving Data Center Energy Efficiency through End-to-End Cooling Modeling and Optimization

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Team

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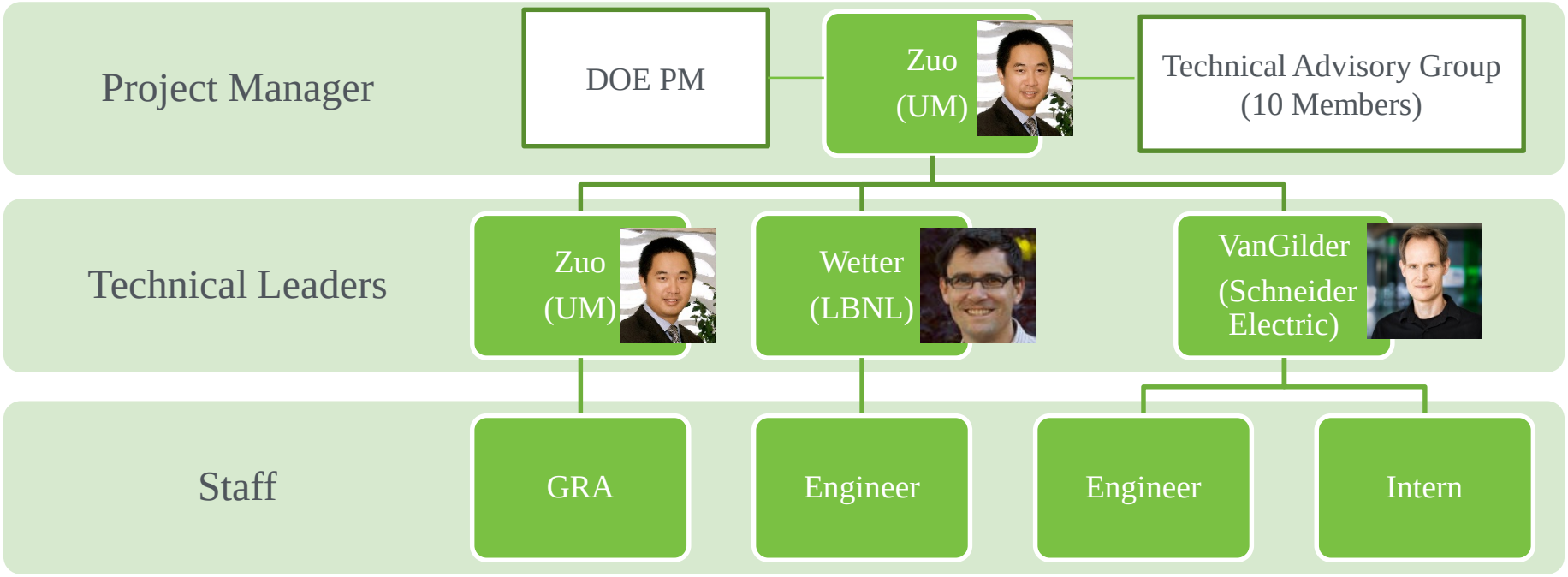

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Challenges:

Data centers in the US use about 2% of the electricity consumed in the nation and about half of this energy is used for cooling.

Vision:

At a target level of performance (**30% saving** in cooling energy), a nationwide adoption of this tool will potentially reduce annual electricity usage by **21 billion kWh** and save about **$2.2 billion**. The target market size is estimated to be about **$593 million** in 2020.

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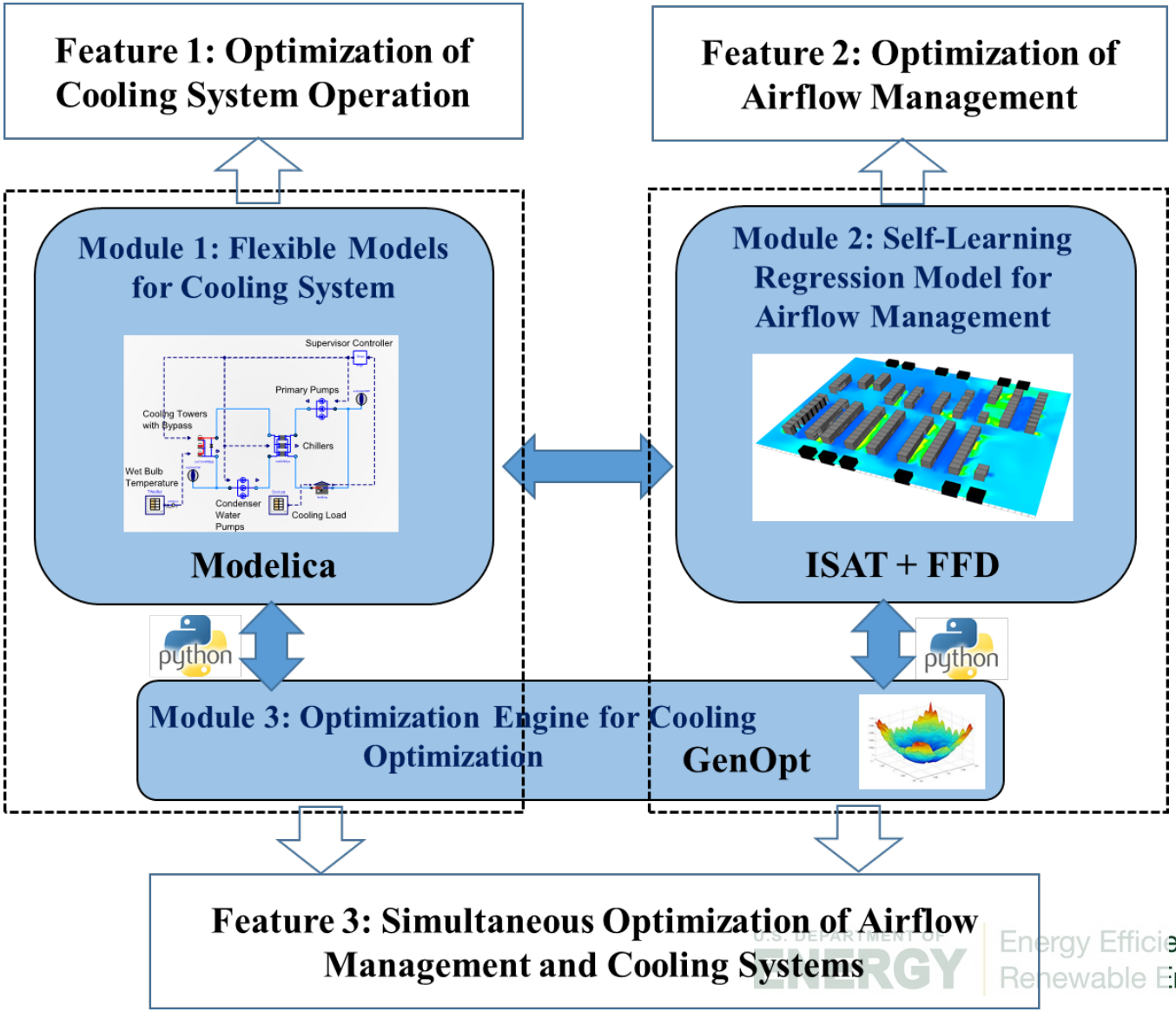
Technology Solution



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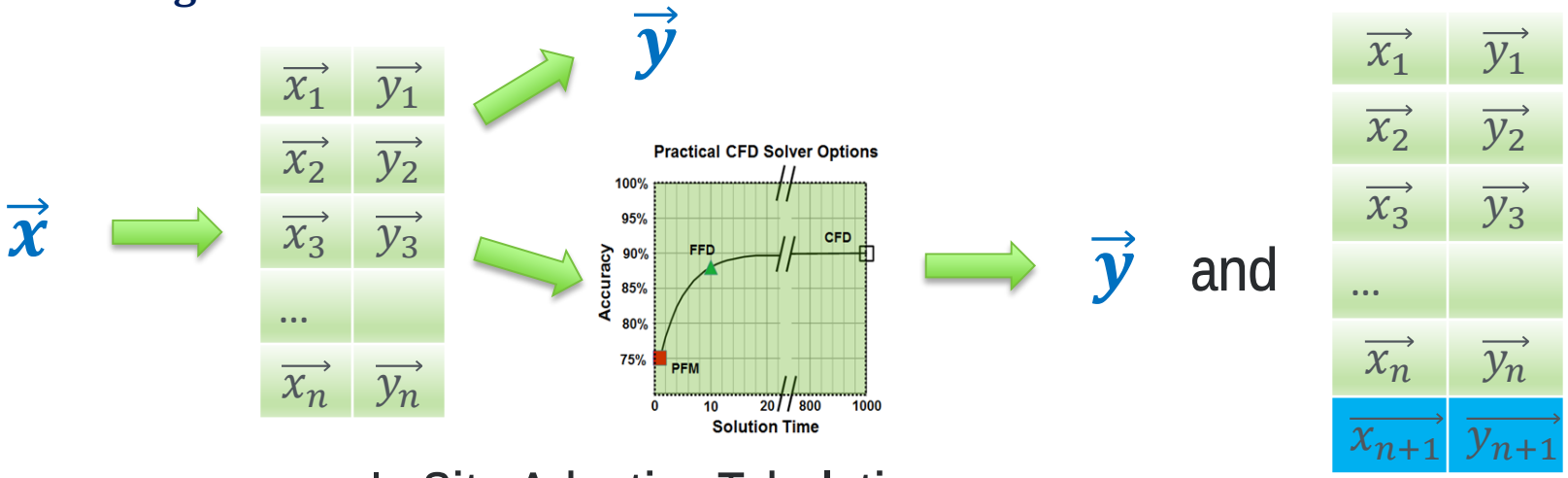
Advantage, Differentiation, and Impact

Self-Learning Fast Indoor Airflow Model



In Situ Adaptive Tabulation

Validation and Demonstration at Two Different Data Centers

- University of Miami Data Center: Chilled Water and DX Coil
- University of Massachusetts Medical School Data Center: AHU with Air Side Economizer

Flexible Packages

- Each package can be used individually
- Modelica Buildings library → Spawn-of-EnergyPlus → OpenStudio

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Thank You

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