2016 Intelligent Efficiency Conference

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Clean Energy Smart Manufacturing Innovation Institute & the Texas A&M Energy Institute
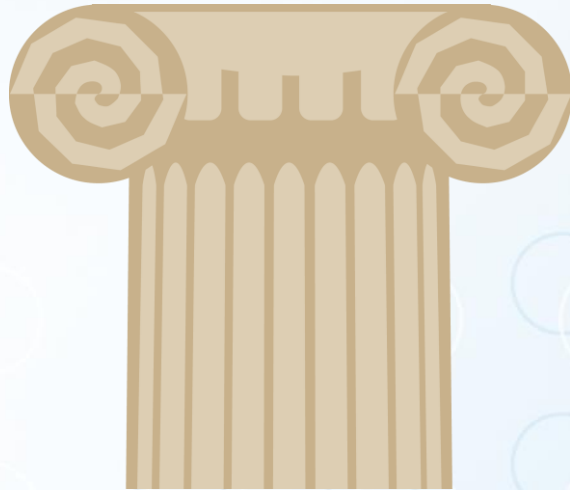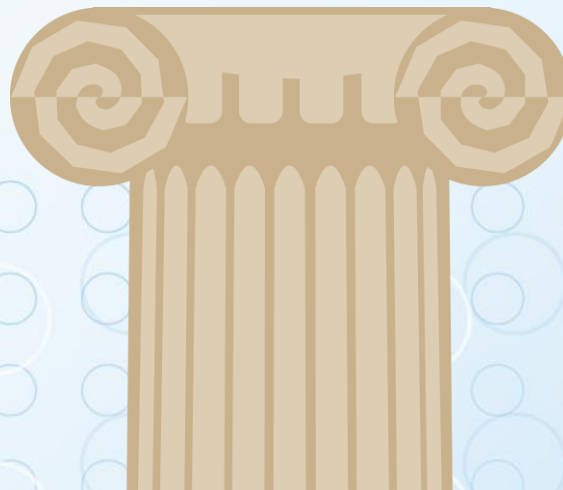
Austin, Texas

December 5th, 2016
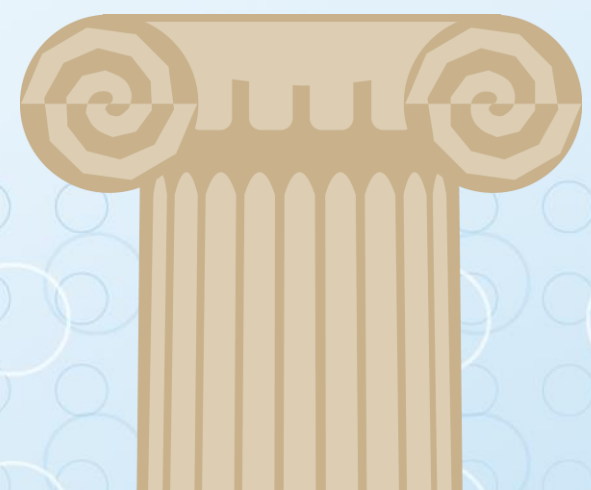
Texas A&M Energy Institute
The Three Pillars

Transform the Energy Research Landscape

Educate the Next Generation of Leaders in Energy

Establish a Vibrant External Partnerships Program in Energy

Texas A&M Energy Institute

RESEARCH THEMES

*Texas A&M Energy Institute research crosses departmental and college boundaries and addresses **all facets of the energy landscape** that naturally connect engineering, sciences, technologies, economics, law, and policy decisions.*
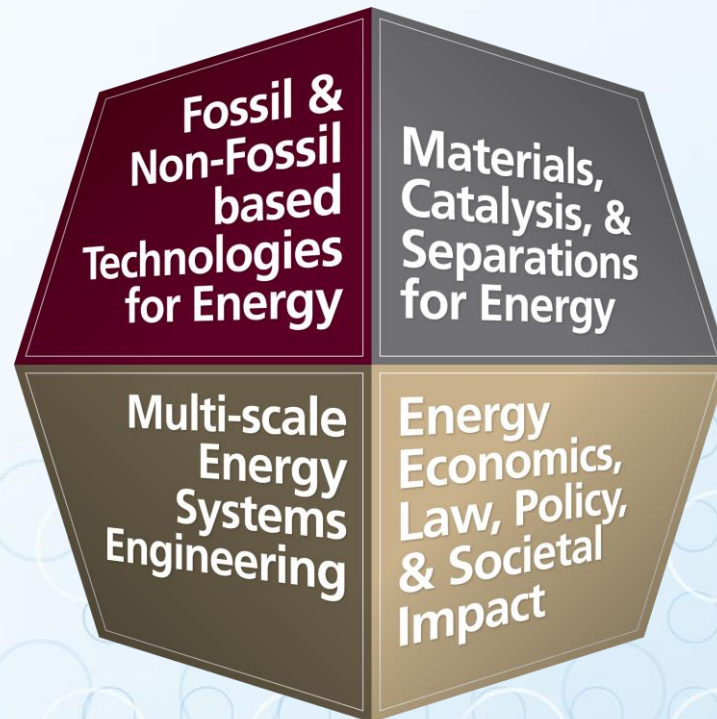
The Texas A&M Energy Institute interdisciplinary research program focuses on the interacting **Research Themes**.

The four interconnected themes are further classified into **10 Research Areas**, and **65 Research Topics**.

Clean Energy Smart Manufacturing Innovation Institute

- Smart manufacturing uses:
  - Advanced sensors
  - Controls
  - Platforms
  - Modeling technologies

- To achieve better management of:
  - Real-time energy utilization
  - Productivity
  - Worker Safety
  - Waste

- Smart Manufacturing encompasses:
  - Machine-to-plant-to-enterprise-to-supply-chain aspects of advanced sensing and instrumentation
  - Real-time process monitoring, control, and optimization;
  - Advanced hardware and advanced software platforms;
  - Predictive modeling and simulation technologies for industrial automation networked for enterprise and ecosystem optimization.
  - Verified in testbed environments

ECO System of " STUFF"

Value Creation

- Demand Driven Supply Chain
- Green Light to Convert | Green Light to Ship | Optimized Inventory

Business Applications

- Allergen/Micro WorkFlow | eCOA
- Supplier Managed Inv | Line Supply | Bin Mgmt
- Overusage | Trace/Recall | BOM Validation | Yard Mgmt | Directed Work

Core Functions

- Production History
- Plant Floor Inventory
- Direct Consumption
- WorkFlow
- Demand Plan
- Production Order
- Line Schedule
- Lot Tracking
- Optimization Engine
- Raw Mat'l Inventory
- Finished Product Inventory

Master Data
(BOM, Specs, Vendor, Ingredients, FP)

Core Systems

| MQIS | MES | SAP ERP | SAP MRP | SAP APO | SAP PLM | Red Prairie |

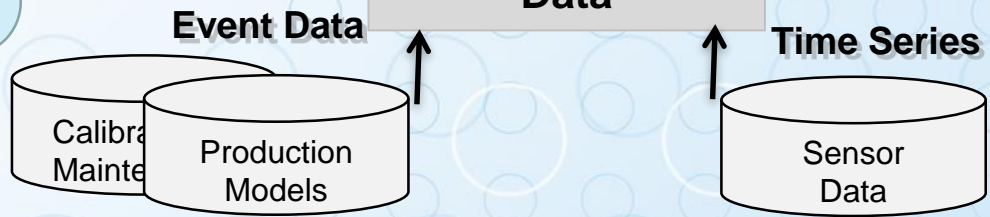**Data Input**

Industry Needs a Platform
CESMII has an Open Implementation Platform

Smart Manufacturing Platform Open Infrastructure

- SM Software Marketplace
- APPs & Toolkits
- Compose Workflows
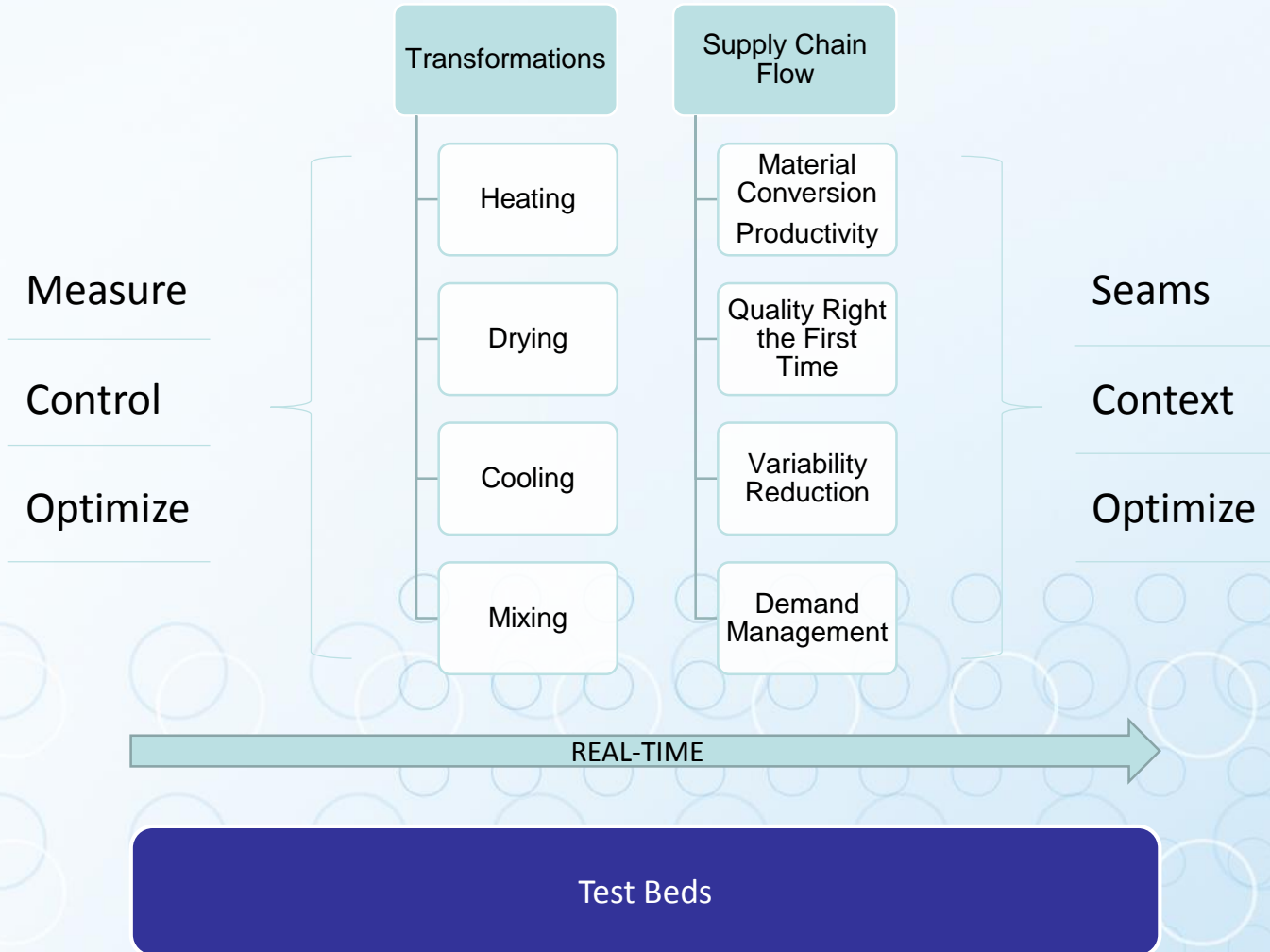- Cloud Deployment
- Private/Public IaaS

SM Value Proposition

Private Smart Manufacturing Platform Appliance

Power Mgmt & Energy Grid

Heating & Forging

Line Operations

Suppliers

Sustainability & Safety

Distribution

Customers

Applications

Context

Mapping

Data

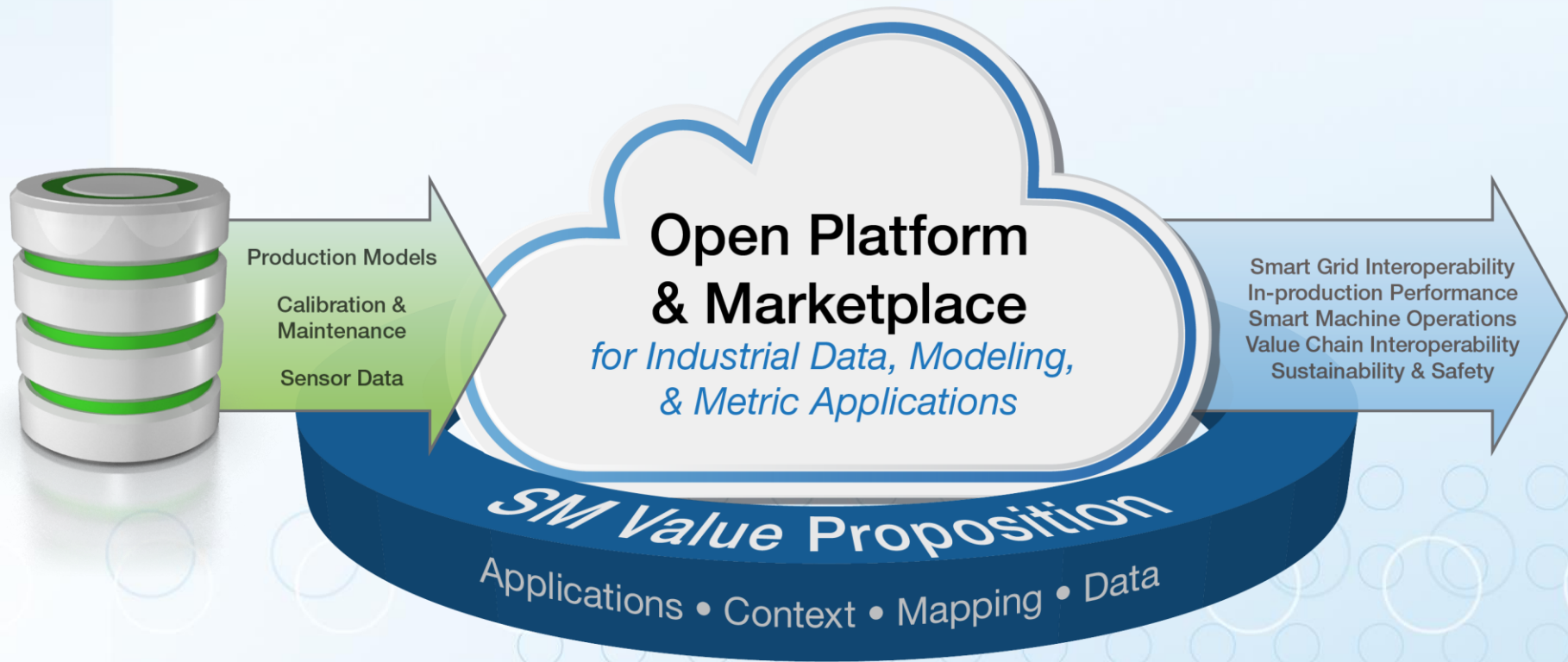**Event Data**

Time Series

Calibra Mainte

Production Models

Sensor Data

Traditional Manufacturing Automation Environment and Software Tools

The Smart Manufacturing™ Platform

CESMII
A National Network of Capability
Headquartered in LA

Northwest

Northeast

California

HQ

Southeast

Gulf Coast

ACEEE
American Council for an Energy-Efficient Economy

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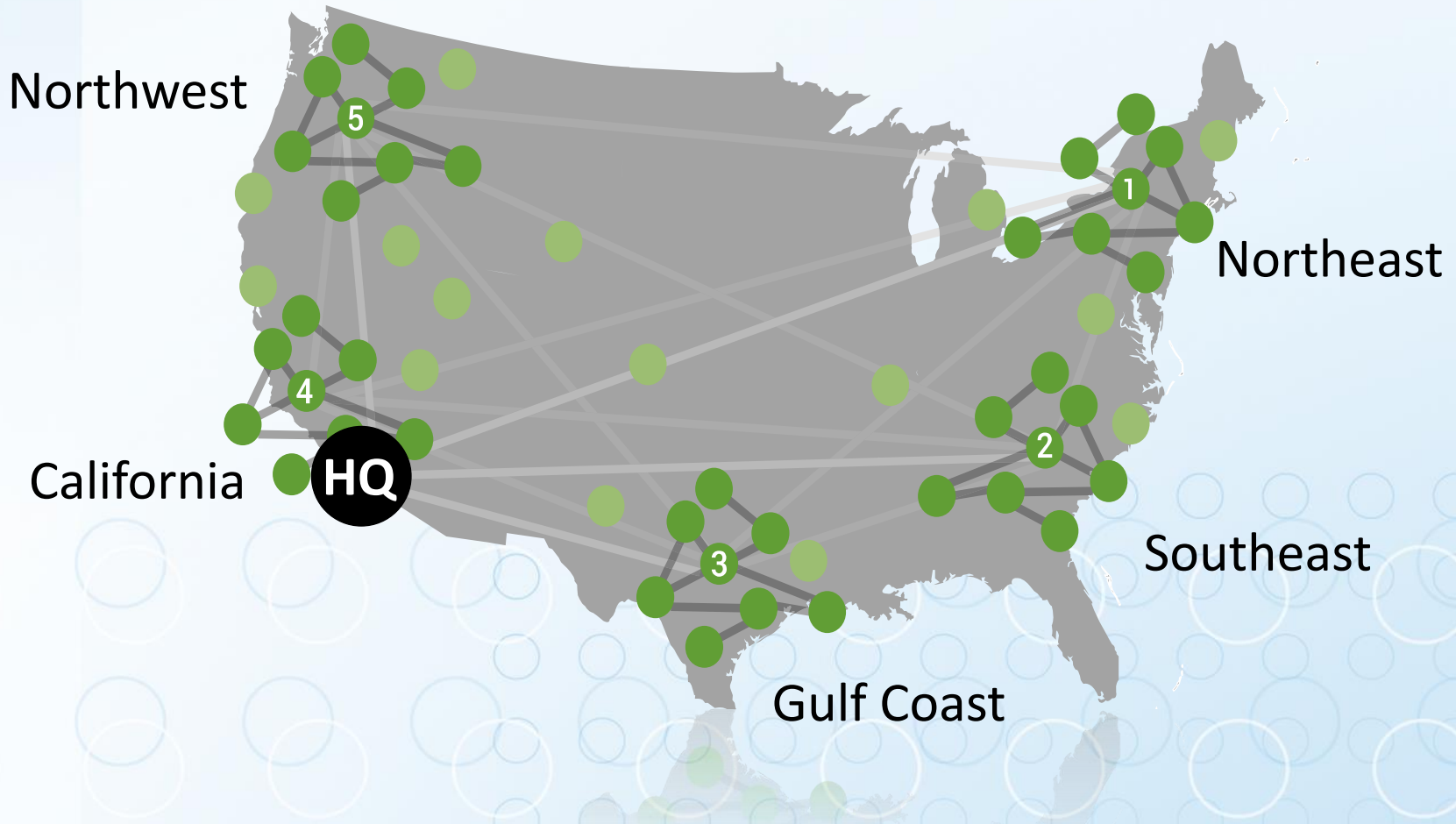
CESMII Business Model

Portfolio of investments that creates an ecosystem of test beds

- leverage unique capabilities, facilities, and networks

- proximity -> easy access to SMEs and energy intensive industries

- building a national resource

- rapid development and dissemination of SM tech

- achieve critical mass

- drive market transformation

- achieve a growing supply chain

Thank you!

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ACEEE::
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