# Energy Systems Technology and Education Center

## Applied Industrial Research

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**Energy Systems Technology and Education Center**

CAES Idaho Research Symposium

February 2, 2011

Idaho State University

INL Idaho National Laboratory

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NEW BEGINNINGS FOR EASTERN IDAHO

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# ESTEC Operating Partners

**Operating Partners guide the strategic direction of the Center**

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**The Energy Systems Technology and Education Center**

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# ESTEC's Mission

**Cultivate the people, educational resources and applied research capabilities necessary to improve the local, regional and national availability of trained workers in support of the construction, operation, and maintenance of current and future energy facilities and occupations.**

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# Partners and Collaborators

- ESTEC partners and collaborators include:
  - ISU Colleges and Centers
  - The Idaho National Laboratory
  - Idaho Utilities
  - Idaho Technical Colleges
  - Local and Regional Industry

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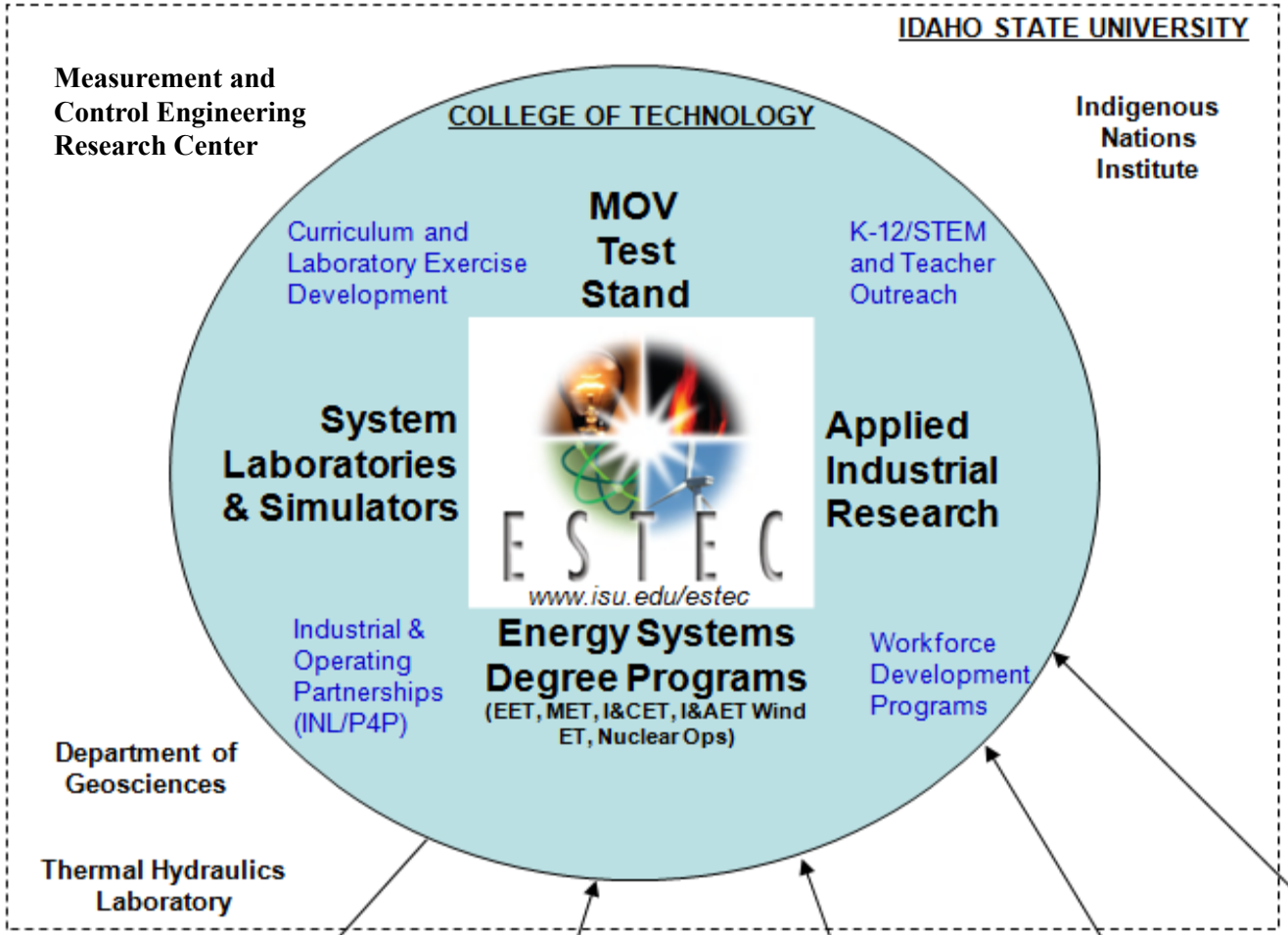
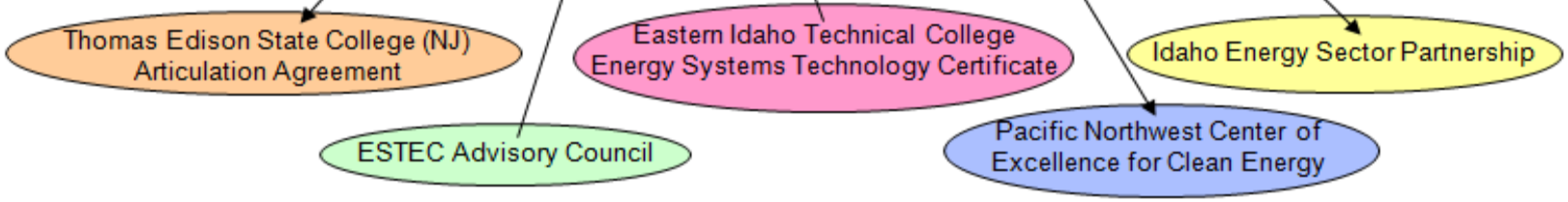
# ISU Energy Systems Technology and Education Center
# Relationships and Applied Industrial Research Capacity




**Applied Industrial Research**

***Multidisciplinary Expertise/Capacity***

- **Equipment Testing/Test Protocols for Electrical, Mechanical, Instrumentation and Control, and Automation Systems**
- **Run to Failure Monitoring/Testing**
- **Reliability, Availability, Maintainability**
- **Man/Machine Interface Assessment**
- **System Safety Evaluations**
- **Independent Verification/Validation**
- **Performance Analysis/Trending**
- **Duty Cycle and Performance Research**
- **Remote Test Monitoring**
- **System Design Mockup**
- **Engineering Design Improvements**
- **Maintenance Procedure Development**
- **Micro-hydro Turbine Research**
- **Applied Geothermal Systems Research**
- **Professional/Technical Educational Research**

ESTEC GRANTS: US Department of Labor, US Department of Energy, National Science Foundation, Nuclear Regulatory Commission, Idaho DPW

# Research Collaboration Projects

- ESTEC research partnerships allow ESTEC to provide research data and research support activities to a wide variety or research initiatives
- ESTEC partnerships and collaborations include other ISU colleges where collaborations in research and development of Idaho's geo-thermal resources are being supported
- ESTEC and Idaho Power Company have collaborated to research and define the performance of Pelton type micro-hydroturbines for use in eastern and southern Idaho

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- **ESTEC continues to work with the College of Science and Engineering in the development of controls and other features of a wind turbine to support research in the field of aerodynamics and air flow modeling**
- **ESTEC has collaborated and provided test equipment, controls and student support for advanced HVAC controls research being conducted by Dr. Subbaram Naidu and Dr. Craig Reiger.**
- **ESTEC is pursuing opportunities to collaborate with local and regional utilities in Smart Grid research.**

# Flow Loops

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# Motor Control Centers

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# Passive Solar

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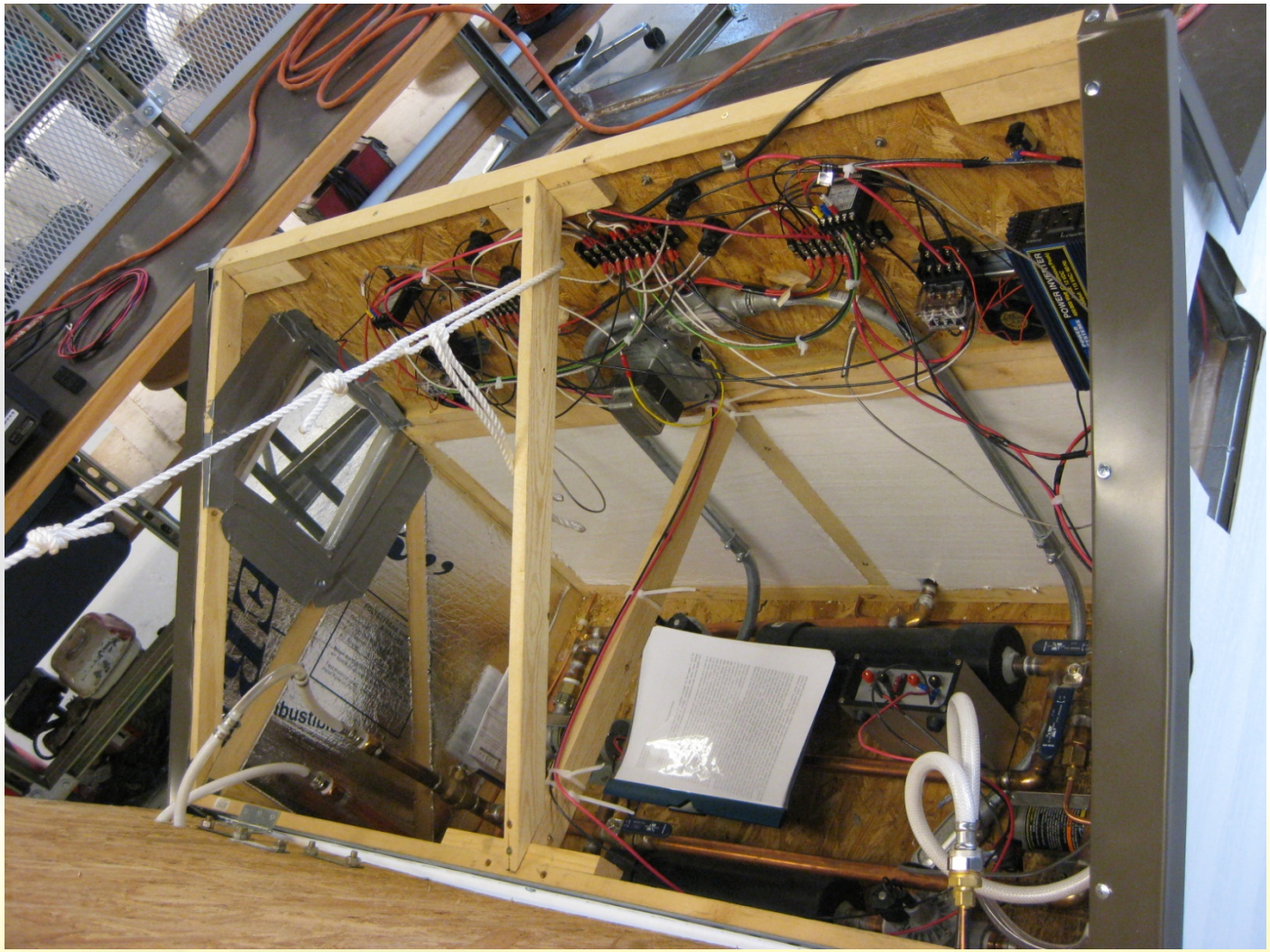

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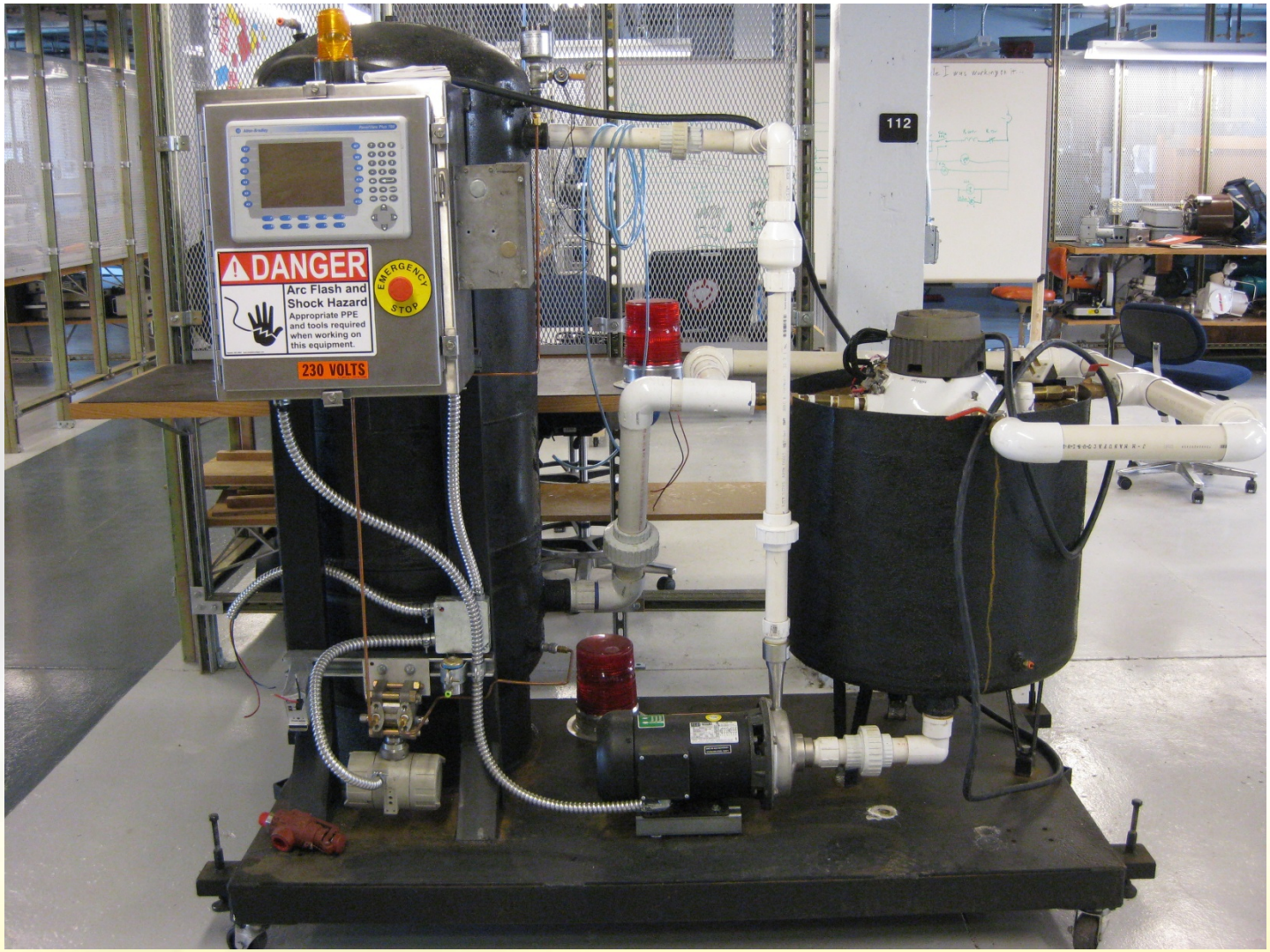


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# Support of Research based Education

- Idaho State University continuing to grow and expand its research activities and is now rated Research University High by Carnegie.
- To continue to expand ISU research and improve opportunities for graduate students, ESTEC offers applied research support for students from all colleges and provides team learning environments for graduate and undergraduate students to pursue research activities using industrial scale systems and components.

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# New Opportunities

**ESTEC welcomes new opportunities and collaborations. The unique partnerships and resources within the ISU and INL communities provide a wide range of resources for future research. ESTEC is actively interested in future opportunities to provide support and expand its research partnerships and collaborations.**

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