



Center for Advanced
Energy Studies

*A research
partnership between
Boise State University,
Idaho National
Laboratory, Idaho
State University and
University of Idaho.*

Nuclear Energy:

Idaho's Role in Workforce & Economic Development

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Outline

- **Introduction**
- **Nuclear Energy**
- **Nuclear Education in Idaho**
- **Private Sector Highlights**
 - **International Isotopes Inc.**
 - **Premier Technology**
 - **AREVA**
- **CAES Nuclear Science & Engineering Initiative**
- **Conclusion**

Introduction

- **The state of Idaho has a proud and illustrious history in nuclear science and energy research and development**
 - Arco was the first community in the world to be lit by electricity generated by nuclear power
 - "National Reactor Testing Station" (NRTS), which is now the Idaho National Laboratory (designated by DOE as the lead nuclear energy research and development facility)
 - Nuclear education at (BSU, EITC, ISU, and UI)
- **With the current infrastructure in place and manpower available, manufacturing and technology development have an even greater chance to become an integral part of the state's economy**
- **It is vital for there to be cooperation and integration of the nuclear R &D, technology deployment, manufacturing, and service capabilities that we have at INL, our colleges and universities, and the private sector**

Nuclear Energy

- **Some Interesting Facts**
 - **Nuclear Energy provides 19.6% of the United States' electricity and 13.5% worldwide (2010)***
 - **104 operating reactors in the U.S. and 435 worldwide**
 - **63 new nuclear plants are under construction in 14 countries***
 - **Cost of new plant construction - Estimates range from \$4 billion in today's dollars for the engineering, procurement, and construction (EPC) cost of a single plant to \$22.5 billion in 2022 for an entire two-unit project, including transmission lines and other services.**
 - **U.S. total revenue for the nuclear power industry was about \$371 billion in 2010 (with share-holder assets of \$1.1 trillion and costs at ~\$80 billion)+**
 - **FY2012 Department of Energy budget for NE – \$768 million (total DOE = \$29.5 billion)**
 - **Expected that nearly 50% of the workforce will retire within 10 years**

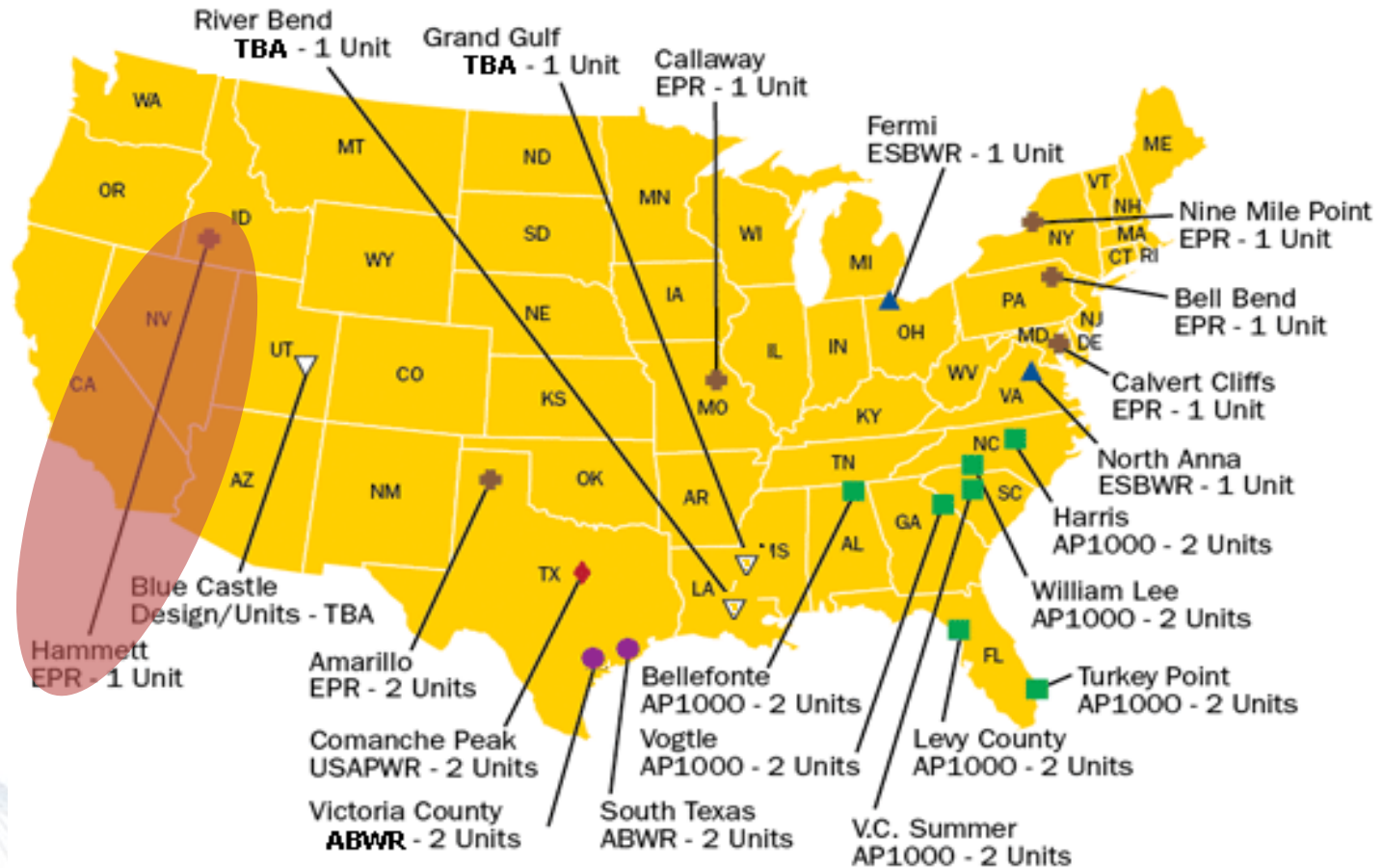
*Nuclear Energy Institute – <http://www.nei.org>

+Edison Electric Institute - <http://www.eei.org>

Nuclear Energy



Nuclear Energy



You may click on a design name to view the NRC's Web site for the specific design.

● ABWR
 ■ AP1000
 ⊕ EPR
 ▲ ESBWR
 ◆ USAPWR
 ▽ Design/Units - TBA

Nuclear-infrastructure in ID

University of Idaho

- Agriculture Research and Extension Centers
- Integrated Design Laboratory
- Idaho Water Research Institute



UI

Idaho National Laboratory

- Advanced Test Reactor
- World class energy research facilities
- One of a kind radiological research facilities
- “Fission” Supercomputing facilities

Boise State University

- Advanced material fabrication and testing
- Center for Materials Characterization
- New Product Development Laboratory



BSU

INL

CAES



ISU

Idaho State University

- Research Reactor/Health Physics
- Idaho Accelerator Center
- Nuclear Engineering Laboratory
- RISE Complex
- ESTEC program

Nuclear Education in Idaho

- The three Idaho state universities (Boise State University (BSU), Idaho State University (ISU), and University of Idaho (UI)) have been aggressively expanding their infrastructure and programs in nuclear science and technology over the last several years
- Increased emphasis on technology development and deployment
- Unique position due to proximity and collaborations with Idaho National Laboratory (INL)
- Collaborations with other national laboratories, government organizations, and the private sector
- Strengthening of ID partnerships through the Center for Advanced Energy Studies (CAES)



Students in Nuclear-related education programs (baccalaureate to doctorate)

University of Idaho*

- Current Enrollment
 - Undergraduate – 0
 - Graduate – 74
 - Graduates Since 2008 – 25
- (*numbers primarily for UIIF)



Boise State University

- Current Enrollment
 - Undergraduate – 12
 - Graduate – 10
- Graduates Since 2008 - 50

INL CAES

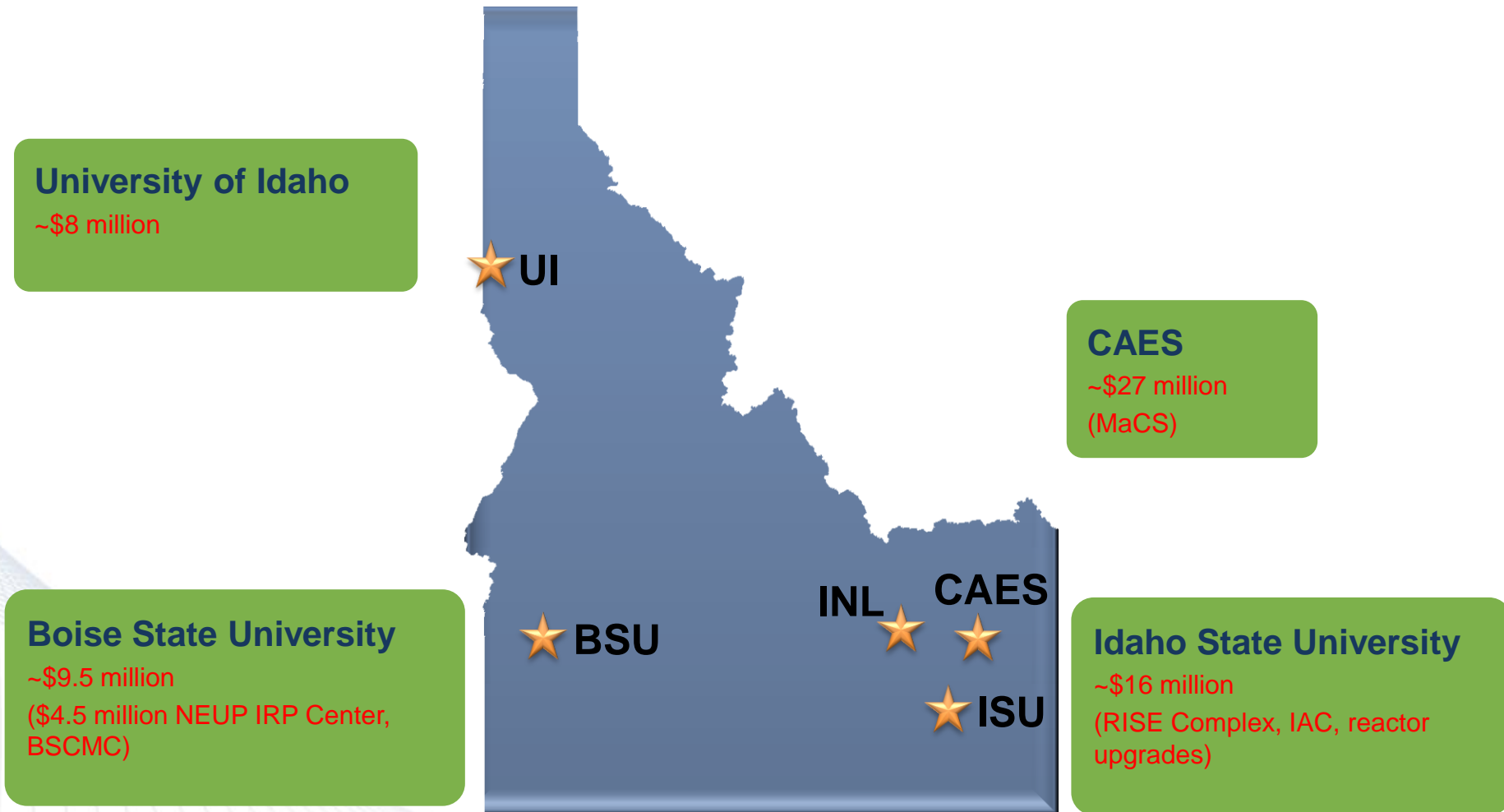


Idaho State University

- Current Enrollment
 - Undergraduate – 117
 - Graduate – 81
- Graduates Since 2008 - 76

Total Current enrollment - 294

External dollars awarded to nuclear-related programs at the Idaho state universities*



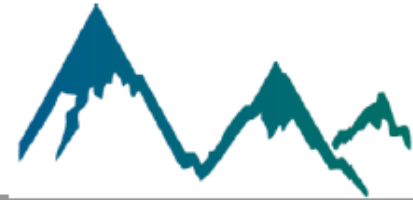
* since 2008, includes research, infrastructure, and support grants and contracts

Private Sector Highlights

- **International Isotopes Inc.**
- **Premier Technology, inc.**
- **AREVA Eagle Rock Enrichment Facility Project**

International Isotopes Inc.

International Isotopes Inc.



- **International Isotopes develops and deploys innovative technological solutions that make people's lives better. We provide world-class products used in a variety of important applications, including:**
 - » **Depleted Uranium De-Conversion and FEP Project Overview**
 - » **Radiochemicals for Cancer Treatment**
 - » **Nuclear Medicine Reference and Calibration Standards**
 - » **Medical Teletherapy Products**
 - » **Transportation Services**

<http://www.intisoid.com/>

International Isotopes Inc.

- **Integrated De-Conversion and Fluorine Extraction Process (FEP) Facility**
 - International Isotopes Inc. (INIS) has selected a site in Lea County, about 15 miles west of Hobbs, New Mexico for the construction of our planned depleted uranium hexafluoride (DUF6) de-conversion and Fluorine Extraction Process (FEP) facility. This is the first commercial facility of its kind in the U.S. This is an environmentally and economically sound process that will safely produce important fluoride products for many technological and alternative energy applications while safely converting the depleted UF₆ into a chemically stable material for storage or disposal.

International Isotopes Inc.

- **Cobalt and radiochemical products for medical treatment**
 - Bringing the benefits of nuclear technology to a wide variety of medical and industrial applications. The cobalt products are used by a broad array of companies for radiation treatment of cancer and vascular deformities of the brain. Cobalt sources are also used for container security examinations at our sea ports and borders. The radiochemicals, such as Iodine-131, are used in medicine for treatment of a host of thyroid diseases and disorders.
- **Cu-67 production at the ISU Idaho Accelerator Center (IAC)**



<http://www.intisoid.com/>

Premier Technology, Inc.

- **Premier Technology, Inc.**
 - **As a vertically integrated engineering, manufacturing and construction management company, Premier Technology possesses the resources necessary to provide turn-key solutions for a wide variety of industries. Our company's experience, from design to delivery, ensures an in-depth understanding of the complexities of each new project. We are committed to providing the highest quality products and services by working as though our clients' problems were our own.**
 - **Premier Technology is a privately owned company based in Southeast Idaho. The company was founded in 1996 with a primary focus on manufacturing. Since that time, Premier has grown to be a full service engineering, manufacturing and construction management company employing nearly 370 highly skilled professionals. Premier's reputation of delivering on-time, quality work has gained the trust of its clients affording them opportunities to serve as a resource for a wide variety of clients.**

<http://www.ptius.net/>

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Premier Technology, Inc.

- **Commercial nuclear industry**

- Approximately 40% of company
- Provides both outage and new construction support
- New plant reactor development (SMR)
- ~\$30M in sales and ~\$350M pending (since 2008)
- Examples of Products and Services include:



- Simplified head assemblies, lift rigs, pressure vessels, structural steel
- NDE services including ultrasound and radiography

- **Government work**

- Gloveboxes, hot cells and related equipment
- Lead and glass shielding, interlocking lead blocks, low level waste boxes

<http://www.ptius.net/>

AREVA

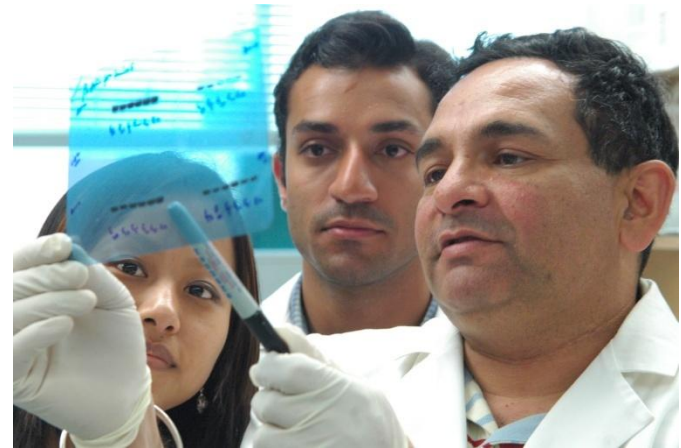
- **Eagle Rock Enrichment Facility**

- 2013 anticipated start date
- \$3 billion (DOE \$2 billion loan guarantee)
- The project, expects to create several thousand construction jobs and 700 permanent positions once operational
- Billions of dollars to the ID economy
- Millions of dollars in support services expected



CAES Nuclear Science and Engineering (NS&E) Initiative - Highlights

- New Faculty and Staff
 - UI – 2, ISU– 2
 - BSU – 2, INL – 2
- Students
 - Very large increase (>100 UG, >100 G)
- Competitive bidding on proposals
- Successful creation of new “summer schools”



Fiscal Year (July 1 – June 30)	Yearly Total	Funding Goal
FY 13*	\$3.0M	\$6.5M
FY 12*	\$4.5 M	\$4M
FY 11	\$8.1M	\$4M
FY 10	\$6.3M	\$4M
FY 09	\$8.0M	\$4M

Conclusion

- **Idaho has been and will continue to be a leader in nuclear education and research, especially with the increased collaborations forged over the last several years.**
- **In addition, Idaho is becoming a leader in nuclear technology development and manufacturing**
- **A potential new nuclear power plant in Hammett and the construction of the AREVA uranium enrichment plant outside of Idaho Falls will only strengthen Idaho's role in nuclear energy**
- **The entire state must realize the importance that nuclear has and will continue to have on the economy (and the enormous potential that could exist!)**

Thank You!

QUESTIONS?