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Developing the Energy Workforce

***Dynamics, Constraints, Realities, Opportunities and the ISU
Energy Systems Technology and Education Center***

**Richard Holman, CPT
Energy Workforce Initiatives
Idaho National Laboratory**

and

**Deputy Director
Energy Systems Technology and Education Center
Idaho State University**

**Idaho Workforce Development Council
The Grove Hotel – Boise, Idaho
October 3, 2007**

What is ESTEC and What Have We Done?

- A partnership between Idaho State University, Idaho National Laboratory and Partners for Prosperity.
- Focus on engineering technician education and training for the energy market sector.
- Three initial degree programs:
 - Instrumentation and Control Engineering Technology
 - Electrical Engineering Technology
 - Mechanical Engineering Technology
- Secured \$2M DoL Community-based Job Training Grant
- Secured \$600K National Science Foundation ATE Grant
- Renovating 25,000 ft² building on ISU campus with \$1.1M investment from Idaho Department of Public Works



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But wait.... there's more!!!!

- Real partnerships with local, regional, national and international energy companies.
- Knowledge and resource partnerships with other educational institutions across the U.S.
- Created the first Applied Industrial Energy Research Center in the Idaho collegiate system.
- Member of the Center for Energy Workforce Development.
- Developing a new vision and proposal for a National Energy Education and Training Network called...

< < < < **ENERGY EdNet** > > > >



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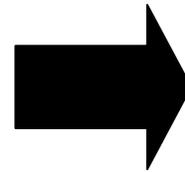
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ESTEC Operating Partners

Operating Partners
guide the strategic
direction of the Center

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**The Energy Systems
Technology and Education
Center**

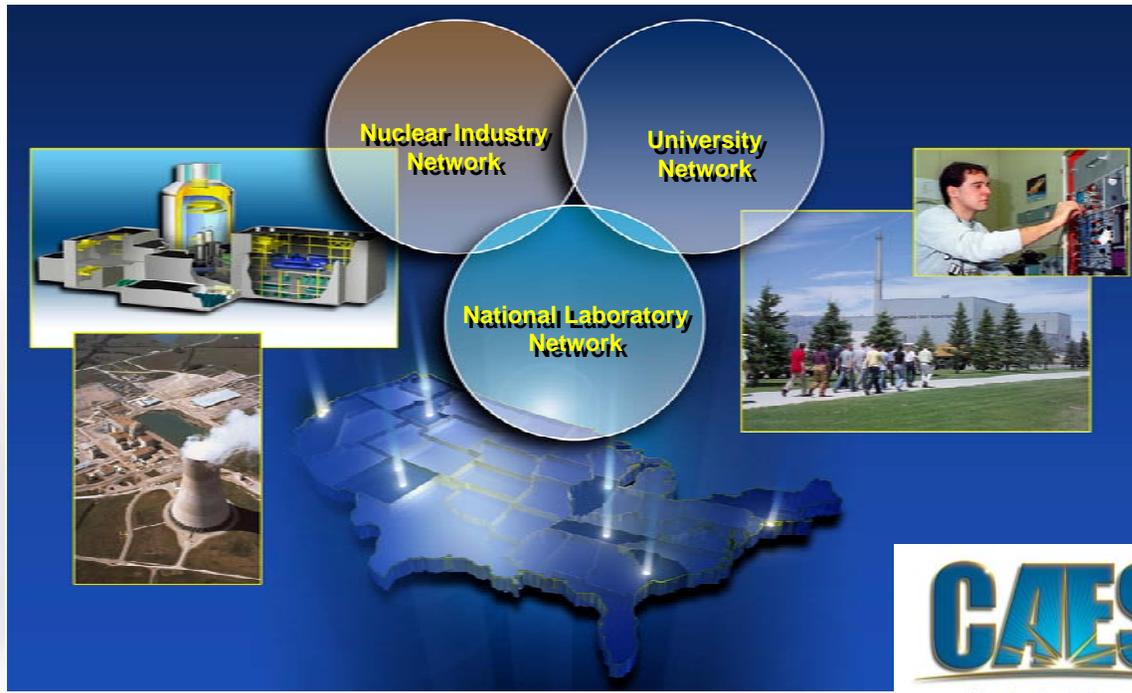


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INL – A Strong Education Focus



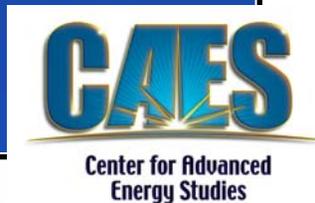
National University Consortium



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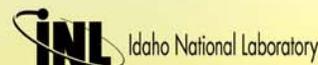
Idaho University Consortium



INL will become:

- The preeminent internationally-recognized nuclear energy R&D Laboratory
 - A multi-program national laboratory with world-class nuclear capabilities
 - A major center for national and homeland security technology development and demonstration

Foster education, research, industry, government and international collaborations to produce the needed investment, programs and expertise



Drivers for Energy Workforce Development

- While challenging under present conditions, *in a growth scenario*, it may be impossible to staff existing energy facilities let alone staff new ones.
- Current approaches to education and training may be among the most significant barriers to overcome in responding to this national challenge.
- New approaches, partnerships and delivery systems must, once again, be considered. The ISU *Energy Systems Technology and Education Center* is a new approach.

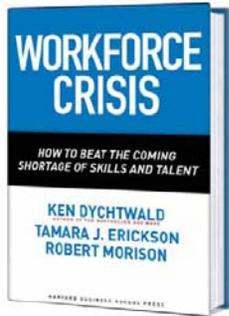


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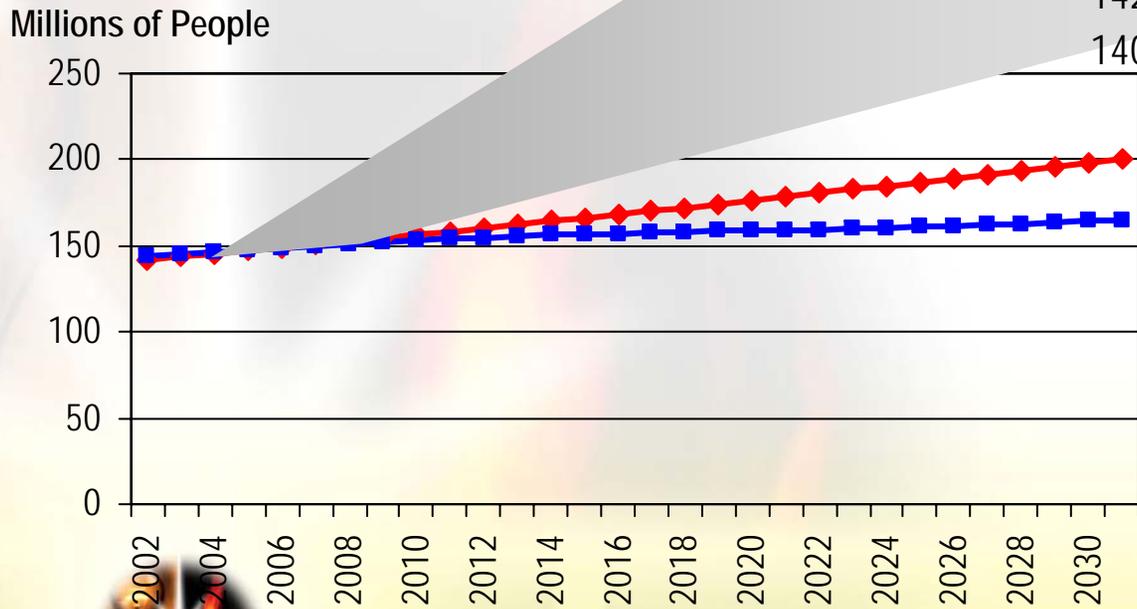
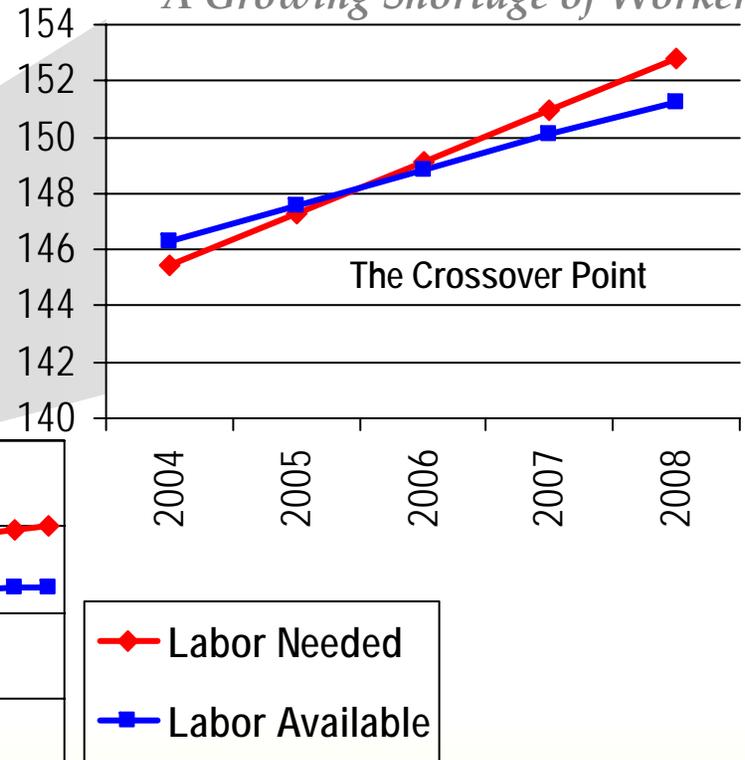
Shifting Workforce Demographics



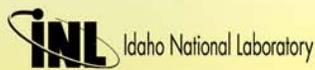
Shifting Demographics are the wake-up call to demand robust Workforce Planning and Re-engineering of the Workforce Pipeline.

Expected Labor Force and Labor Force Demand

The Lines Are Crossing:
A Growing Shortage of Workers



Source: Employment Policy Foundation analysis and projections of Census/BLS and BEA data.



Once Weekly Reminders Are Now Daily



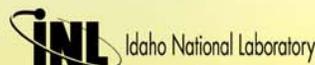
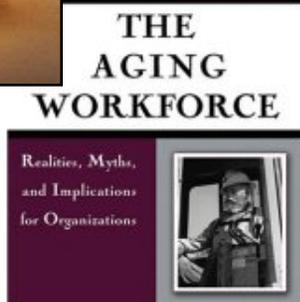
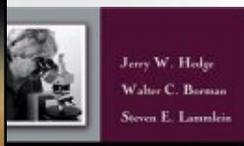
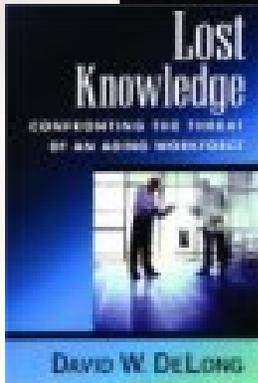
Skilled worker shortage hurts U.S.
 Employers would be hiring more if they could just find the skilled workers they need.
 By Chris Isidore, CNNMoney.com senior writer
 January 4 2007: 4:20 PM EST
 NEW YORK (CNNMoney.com) -- The biggest problem with job growth right now isn't too few new jobs. It's too few skilled workers.



Some Web Job Sites Put Out 'Gray Hair Welcome' Signs

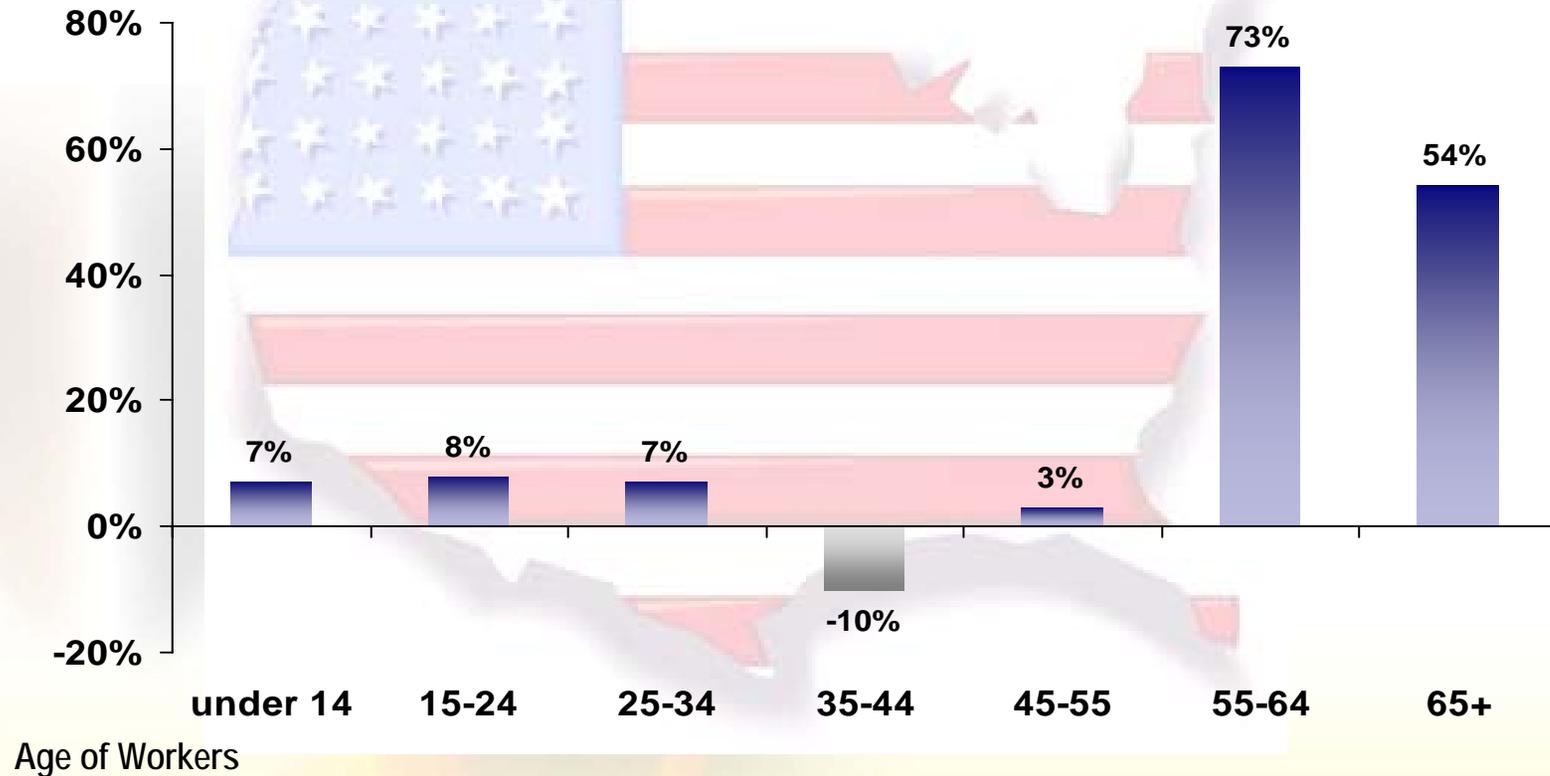


Andres Henderson for The New York Times
 Nancy Collins, recruiting director of Yale-New Haven Hospital, has many job openings.



Key Segments in Decline

Percent Growth in U.S. Workforce by Age: 2000-2020



Source: U.S. Census Bureau

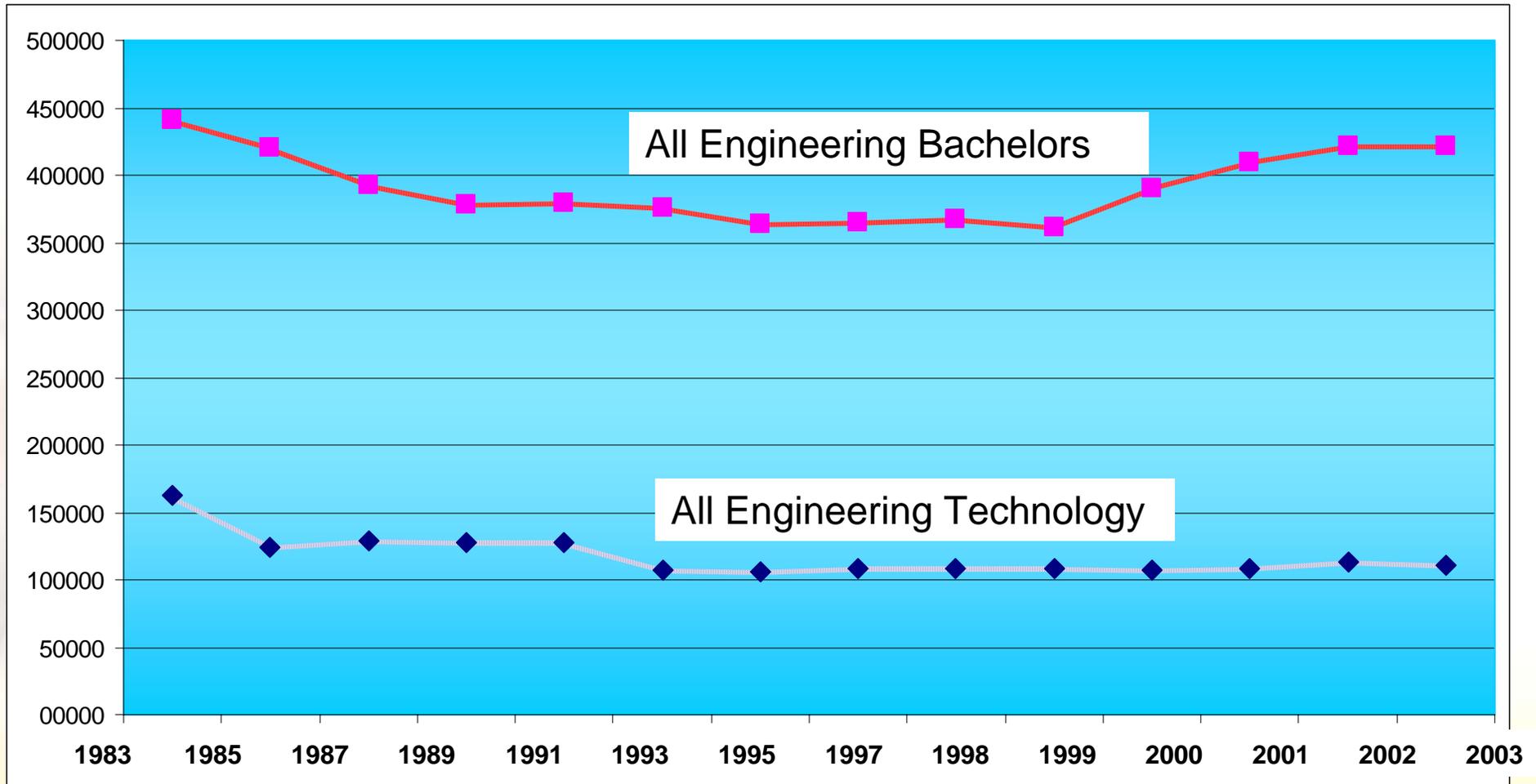


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Flat Degree Production



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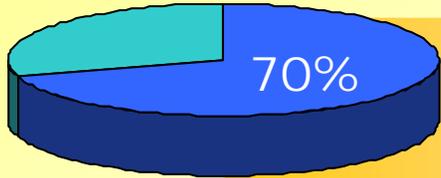
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NSF Science and Engineering Indicators, 2006
Appendix 2-10

A National Crisis

IN THE NEXT DECADE

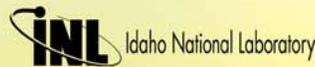


of current workforce will not be college graduates



75% of all workers will need retraining

While over two-thirds of new jobs will be knowledge-based



Source: US Department of Labor

The Implications Cross ALL Market Sectors

Workforce Shortages



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Principal Workforce and Training Acts

1946 PL 79-304 Employment Act

1953 PL 83-163 Small Business Act

1958 PL 85-536 Small Business Administration extension

1961 PL 87-27 Area Redevelopment Act

1962 PL 87-415 Manpower Development and Training Act

1963 PL 88-210 Amendments to National Defense Education Act

1964 PL 88-452 Economic Opportunity Act

1965 PL 89-333 Amendments to Vocational Rehabilitation Act

1973 PL 93-203 Comprehensive Employment and Training Act

1976 PL 94-482 Overhaul of vocational education programs

1978 PL 95-523 Full Employment and Balanced Growth Act

1982 PL 97-300 Job Training Partnership Act



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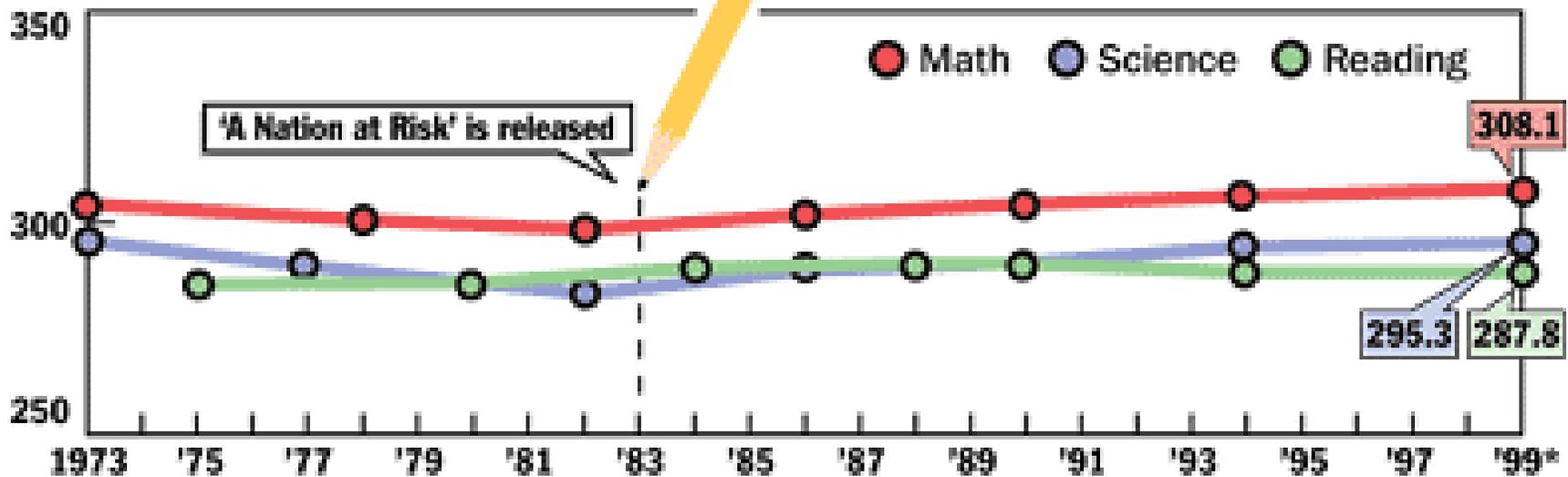
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Workforce and Training Legislation Results

Three decades of NAEP scores

Long-term trends reflect little change in reading, math, and science scores among high school seniors, according to National Assessment of Educational Progress standards.



*Most recent data available

Source: National Center for Education Statistics

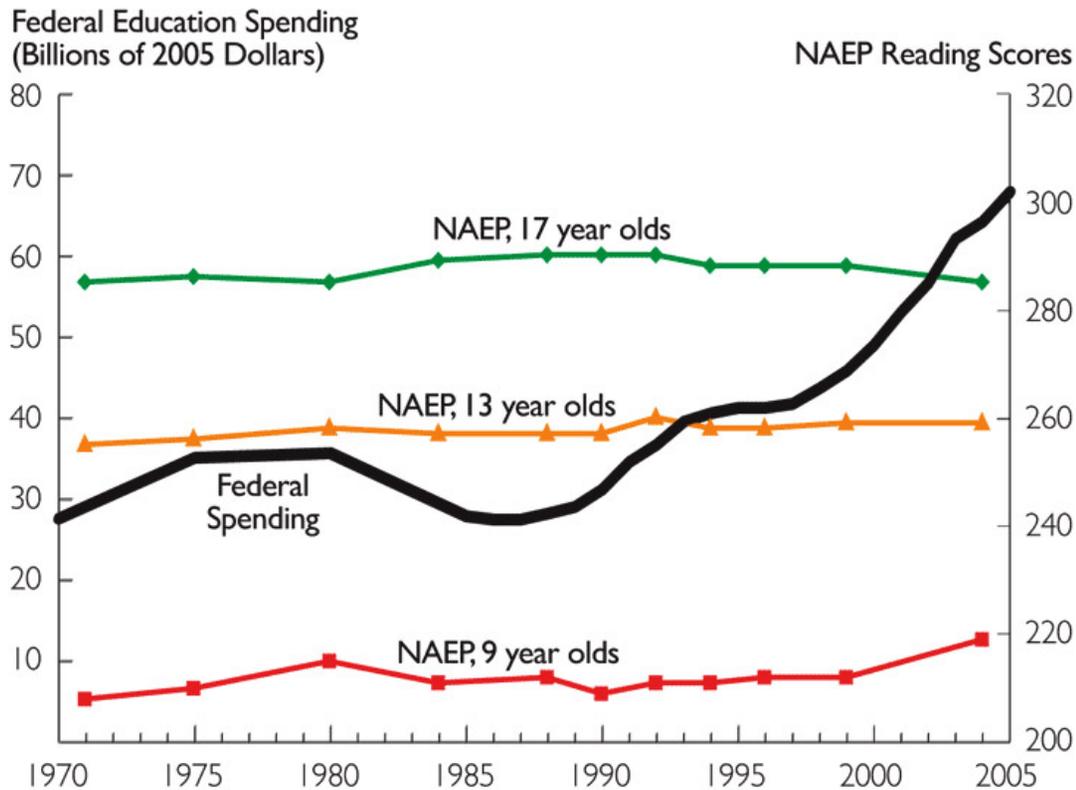


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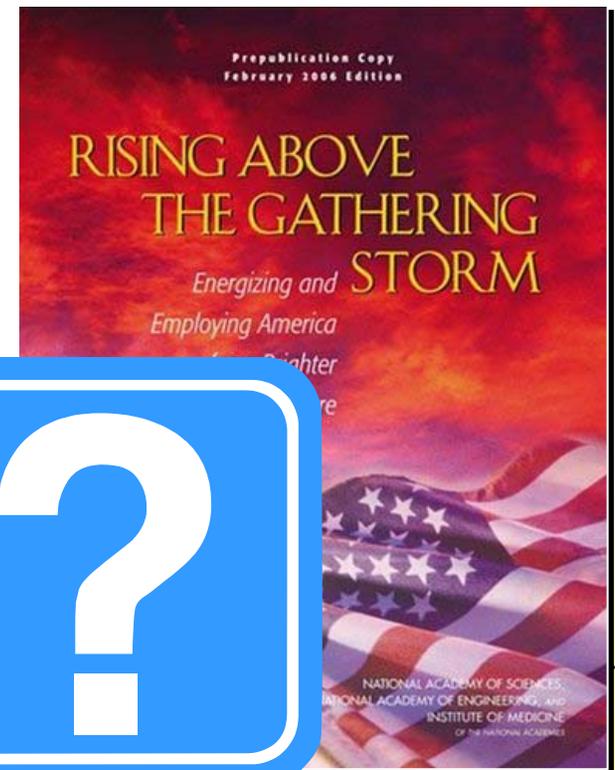
Federal Education Spending and Reading Scores



Note: Spending data were adjusted using the federal funds composite deflator.

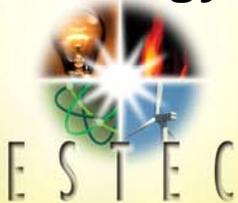
Sources: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics: 2005*, Table 356, at nces.ed.gov/programs/digest/d05/tables/dt05_356.asp (November 15, 2006); U.S. Department of Education, National Center for Education Statistics, "NAEP 2004 Long-Term Trend Summary Data Tables," updated July 11, 2005, at nces.ed.gov/nationsreportcard/ltr/results2004/2004_sdfs.asp (November 15, 2006); and Office of Management and Budget, *Historical Tables, Budget of the United States Government, Fiscal Year 2006* (Washington, D.C.: U.S. Government Printing Office, 2005), pp. 184–185, Table 10.1, at www.gpoaccess.gov/usbudget/fy06/pdf/hist.pdf (September 18, 2006).

A cycle of legislation without visible progress that persists even now.



The Energy Systems Technology and Education Center – A Working Model

- A unique partnership of regional, state, national and international industry, learning institutions, social service agencies, government and DOE Laboratory.
- Funded by a \$2M U.S. Department of Labor Community-based Job Training Grant and \$600K National Science Foundation Grant.
- **Integrating education, employment and economic development.**
- Delivering ABET-accredited and nationally standardized Engineering Technology AAS and BS degrees in the energy systems operations and maintenance areas.
- Addressing the unique needs of unemployed, underemployed and under-represented populations.
- Providing education programs for K-12 students, teachers, parents and counselors.
- Sustaining the program post-grant through an applied industrial energy research program.



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Our “Recipe” for Improving the Workforce Outlook:

Actively Link Industry, Education, Government and Social Services

- Inform K-12 Programs – both content and approach
- Create career awareness as early as 6th grade
- Strengthen technology curricula (Jr. High)
- Expand Technical Preparatory Programs (Sr. High)
- Engage Parents, Teachers, Counselors and Students



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Our “Recipe” for Improving the Workforce Outlook:

Actively Link Industry, Education, Government and Social Services

- Engage the unemployed, underemployed and under-represented populations by providing:
 - Preparatory and remedial assistance
 - Internships and scholarships
 - Assurances of employment for successful candidates
- Retrain/ready those already in the workforce to fill more senior positions.



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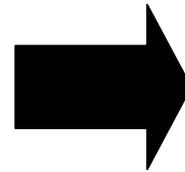
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guide the strategic
direction of the Center

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The Energy Systems
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Proposal Partners Comprise Advisory Council

Industry/Econ. Dev.

Idaho National Laboratory**
 Idaho Power (Chair)
 Washington Group International
 Entergy Corporation
 PacifiCorp LLC
 AREVA
 EPRI (proposed)
 NIDA Corporation
 Idaho TechConnect
 Regional Coordinating Council

Engaging industry in defining and supporting the creation of energy sector-wide programs for operators and technicians. Including economic development organizations to leverage the opportunities.

**Operating Partners



Education

Idaho State University**
 Boise State University
 Central Virginia Community College
 Thomas Edison State College (NJ)
 ISU College of Engineering
 Bismarck State College (ND)
 Excelsior College (NY)
 Idaho State Board of Education
 Idaho School Superintendents
 Tech Prep Programs (Regions 5 & 6)

Engaging local, regional and national educational institutions and K-12 in collaborating on, contributing to and adopting awareness programs and curriculum.

Social Services/Gov't

Partners for Prosperity**
 Shoshone Bannock Tribe
 Idaho Migrant Council
 Veterans Administration
 Center for New Directions
 Idaho Women in Nuclear
 IGNITE
 Idaho Department of Labor

Engaging the unemployed, underemployed and under-represented populations.



Products and Milestones



- K-12 Energy Education Programs (in progress)
- Excellence in Energy Education Teacher In-Service (06/2007)
- Member - Center for Energy Workforce Development (07/2007)
- **AAS Energy Systems I&C Engineering Technology – Initial Offering (08/2007)**
- General Fundamentals Examination Prep Course development (09/2007)
- **AAS Nuclear Engineering Technology Collaboration with Excelsior College (08/2008)**
- **AAS Energy Systems Electrical Engineering Technology – Initial Offering (08/2008)**
- **AAS Energy Systems Mechanical Engineering Technology – Initial Offering (08/2009)**
- **AAS Non-destructive Evaluation AND AAS Radiological Controls Collaboration with Central Virginia Community College (08/2010)**
- **NSF National Center of Excellence for Energy Systems Education and Training (01/2011)**



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ESTEC Impact - Community, Region, Nation

- ESTEC is THE destination for those interested in an energy sector career
- ESTEC provides opportunity for a diverse population
- ESTEC is an attractor to energy product vendors/suppliers
- A Vision - Idaho State will become a national focal point for all aspects of energy-related education and programs
- Idaho will be ready for new energy facility construction and staffing and is a resource to all U.S. utilities



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What Can You Do?

Passing the Word

- **Become a mentor for a student in need.**
 - **Math, Science, English, Role Model**
- **Look for those in need of an opportunity.**
Energy jobs pay between \$40 & \$70K/year.
- **Make students aware of scholarship opportunities – many students would attend if resources were known to be available.**
- **Advertise and support the Excellence in Energy Education Workshops soon to be sponsored by ESTEC.**
- **Tell others in your network of contacts and professional associations of the ESTEC effort.**
- **Donate to ISU's College of Technology and designate ESTEC.**
- **Ask for ESTEC briefings in your region.**



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**For more information or assistance
please contact:**

**Scott Rassmussen – 282-3265
ESTEC Director - ISU**

**Richard Holman – 520-0698
ESTEC Deputy Director - INL**



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