Mining Engineering Development Board

Missouri S&T Campus Profile

John F. Carney III, Ph.D., PE
April 2, 2008
Advancing Excellence
Capital Campaign Progress

As of February 29, 2008

$138.3M
56 months

Dollars Raised
Dollars (in millions)
Months

Dollars
Months
Career Opportunities Center

- 286 employers at the 2007 Fall Career Fair
  - largest career fair in campus history
  - Over 800 recruiters participated
  - over 3,200 students participated
  - 36 states were represented
  - 113 employers from Missouri
Maintaining High Academic Quality

Average ACT Composite Score by Year: 2000 - 2007 First-time Freshmen

Ave. Freshmen ACT Score  Goal: Maintain Ave ACT in Top 10%
Human Powered Vehicle National Champions!
Solar House
Engineers Without Borders

- **2007 projects**
  - Solola, Guatemala
  - Santiago, Honduras
  - Rio Colorado, Bolivia
  - Inka Katurapi, Bolivia

- **2008 projects**
  - Solola, Guatemala
  - Santiago, Honduras
Gala

September 20, 2008
Mechanical and Aerospace Engineering Building
Residential College II
Explosives Camp
Miners set nine school records during the course of the national meet held at Mizzou. The also earned 40 All-American awards, including 33 finishes among the top eight.
National Coach of the Year!

- Doug Grooms named as the College Swimming Coaches Association of America’s national “Coach of the Year” for the 2007-2008 season.
For the first time in history, the Lady Miners made it to the Sweet Sixteen of the Division II tournament. The Lady Miners ended their season with a very impressive record of 24-7.
Legislators Visit Campus
January 15

- 31 legislators participated in a campus visit
Innovation Park
Construction of the Tech Park / Incubator will cost $128.0 million to build, with $42.0 million in equipment.

- **Over 12 years, this project returns:**
  - $43.39 million in general revenues to Missourians
  - $822.24 million in new personal income to Missourians
  - $842.81 million in new value-added / gross state produce to the economy
  - $997.02 million in new economic activity / output to the state economy

- **On average each year, the project creates:**
  - 1,026 new jobs annually paying an average wage of $41,644 per job
  - $ 3.6 million in general revenues on average each year
  - $68.5 million in new personal income on average each year
  - $70.2 million in new value-added / GSP on average each year
  - $83.1 million in new economic activity / output on average each year
GE Aviation University Development Center

- Process started with 393 universities
- 10 universities invited to submit proposals
- Missouri S&T ranked #1
- Excellent cooperation between City and University
- Center will begin operation in May
- Expected to employ 100 professionals by 2010
Average enrollment is 5,615
Technological Research Universities

- Quality indicators
  - ACT 75\textsuperscript{th} percentile
  - First-year students from top 10\% of HS Class
  - First-to-second year retention rate
  - Six-year graduation rate
  - National merit scholars
  - National academy members
  - Total research expenditures per faculty
  - Ph.D’s awarded per faculty
  - Ratio of doctoral degrees to graduate degrees
  - Student faculty ratio
<table>
<thead>
<tr>
<th>University</th>
<th>Combined Mean</th>
<th>Rank</th>
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<tbody>
<tr>
<td>Massachusetts Institute of Technology</td>
<td>1.2</td>
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<tr>
<td>California Institute of Technology</td>
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<td>Rensselaer Polytechnic Institute</td>
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<td>3</td>
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<td>Georgia Institute of Technology</td>
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<td><strong>Missouri University of Science and Technology</strong></td>
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<tr>
<td>Stevens Institute of Technology</td>
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<td>Colorado School of Mines</td>
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<td>Worcester Polytechnic Institute</td>
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<td>Illinois Institute of Technology</td>
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<td>Clarkson University</td>
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<td>Polytechnic University</td>
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<tr>
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<td>South Dakota School of Mines &amp; Technology</td>
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</tr>
</tbody>
</table>
- Missouri School of Mines and Metallurgy – 1870

- University of Missouri-Rolla – 1964

- Missouri University of Science and Technology (Missouri S&T) - 2008
Missouri University of Science & Technology
NEXT RIGHT
What are the two most critical technological problems facing the United States and the World?
\[ E^2 = C \]
Energy and the Environment =’s Civilization
Energy Facts

- The U.S. spends over $500 billion dollars annually on energy.

- Oil imports account for 55 percent of total U.S. consumption, up from 42 percent in 1990.

- Energy demand is projected to rise by over 30 percent by 2020, much faster than the projected increase in domestic energy production.
U.S. National Energy Policy

Key goals of the recent U.S. Department of Energy Comprehensive Energy Strategy include:

- **Diversify America’s energy supply by:**
  - Promoting alternate and renewable sources of energy
  - Encouraging the expansion of nuclear energy in a safe and secure manner
  - Increasing domestic production of conventional fuels, and
  - Investing in science and technology.

- **Modernize the electric power infrastructure**

- **Expand strategic petroleum reserves**
Missouri S&T is part of the solution!
Our University is uniquely qualified to tackle these critically important technological issues.

Our research areas include all phases of the energy supply and demand system:

- Transportation and transportation fuels
- Nuclear energy
- Energy production from clean coal, biomass, unconventional oil and natural gas, wind, and the sun
We are the only University in the United States that has over 90% of its student body majoring in engineering, the sciences, mathematics, or business.

We are the only University in the United States that has 16 different engineering bachelor degree programs.

We are the only University in the United States that offers degree programs in Environmental Engineering, Geological Engineering, Geology and Geophysics, Mining Engineering, Nuclear Engineering, and Petroleum Engineering.
Some Current Research Activities

- **Energy and environment**
  - H₂ Fuels in Transportation and “Show Me the Road to Hydrogen
  - Agricultural Waste to Energy
  - Alternative Fuels Production
  - Algae Produced Biofuels
  - Wind Turbine Power
  - Hybrid (wind and solar) systems
  - Grid Reliability with Distributed Energy and Storage
  - Solar-Power Street Lighting
  - Solid Oxide Fuel Cell Development
  - Phytoremediation and Natural Treatment Systems
  - Coal Combustion Products
  - Greener Engines
Some Current Research Activities

- **Green materials and processes**
  - Solid Oxide Fuel Cell Materials
  - Improving Steel Industry Energy Efficiency
  - Geological Sequestration of CO2
  - Life Cycle Greenhouse Gas Emission Comparison
  - Development of environmentally friendly coatings
  - Bio-Based renewable building materials
  - Recycled materials
Some Current Research Activities

- The built world
  - Drinking Water Testing and Treatment Methods
  - Lead in Drinking Water Research
  - EMS Systems Development
  - Global Air Contamination
  - Indoor air pollution
Some Current Research Activities

- Impacts on our environment and society
  - Biodevelopment Impacts and Bioinformatics
  - Toxicity of Nanoparticles in the Environment
  - Extremeophile Discovery
Energy Research and Development Center

Director

Mariesa L. Crow, Ph.D., P.E.

Fred W. Finley Distinguished Professor of Electrical Engineering
Energy Research and Development Center
Mission

- Educate students in energy topics by:
  - Solving problems of society to deliver solutions for energy-related issues
  - Forming collaborative relationships with industry and government
  - Benefiting the University, the State of Missouri, and the nation.
Energy Advisory Council

**Jon Bereisa**
Director
Automotive Competitive Fuel Cell Program
General Motors Corporation

**Tim Herrmann**
Vice President
Nuclear Engineering
AmerenUE

**Ted Ruppert**
CEO, President, Owner
Glaize Development Company

**Dianna Tickner**
Vice President
Generation and BTU Development
Peabody Energy

**Tom Voss**
Chief Executive Officer
AmerenUE

**Phil Wade**
President
Bluegrass Energy, Inc.

**Joan Woodard**
Executive Vice President and Deputy Laboratories Director
Sandia National Laboratories
E2 Campus

- Installation Hydrogen Fueling Station
- Installation of Solar-Electrolysis
- Installation of 5 kW Hydrogen Fuel Cell
- Alternative Energy Education Center
- Wind Turbines
- Solar Decathlon Home
- Waste-to-energy
- Water Recycle Demonstrator
Our students should be leaders in the social, political, and technological activities associated with building a sustainable future for the planet.
- Gary Forsee
  1972 BS in Civil Engineering

- Cheryl Walker
  1986 BS in Electrical Engineering