

# ***Oklahoma's Current Needs and Future Plans: How EPSCoR is Helping***

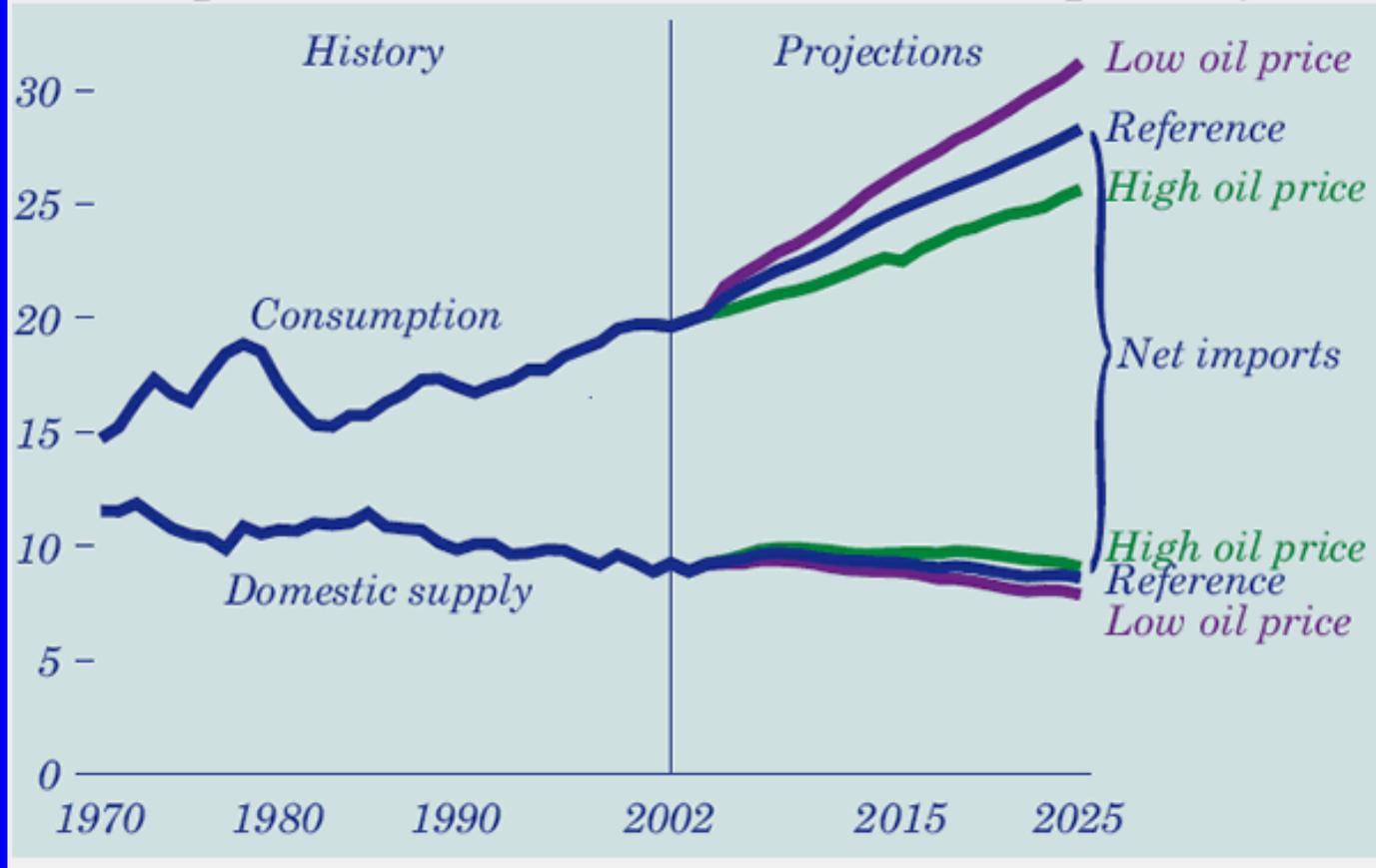
James P. Wicksted, Associate Director  
Oklahoma EPSCoR

Presented at the DOE-NSF Conference  
Morgantown, West Virginia  
June 15, 2005



# Energy Imports Will Grow

*Figure 99. Petroleum supply, consumption, and imports, 1970-2025 (million barrels per day)*



# Oklahoma Oil and Gas Production

<u>Year</u>	<u>Oil Wells</u>	<u>Barrels</u>	<u>Gas Wells</u>	<u>MCF*</u>
2003	83,415	64,676,767	34,334	1.567x10 <sup>9</sup>
2002	83,730	66,030,455	33,279	1.560x10 <sup>9</sup>
2001	84,160	68,725,026	32,672	1.604x10 <sup>9</sup>
2000	84,432	71,256,935	31,580	1.661x10 <sup>9</sup>
1999	85,043	71,047,405	30,978	1.579x10 <sup>9</sup>
1998	85,691	77,796,579	30,501	1.649x10 <sup>9</sup>
1997	86,765	83,124,976	30,101	1.691x10 <sup>9</sup>
1996	88,144	85,623,876	29,734	1.737x10 <sup>9</sup>
1995	90,557	87,656,947	29,733	1.775x10 <sup>9</sup>
1994	91,289	90,998,504	29,337	1.890x10 <sup>9</sup>

\* thousand cubic feet

# Research Capital of the Plains

oklahoma's

**EDGE**

economic development generating excellence

## EDGE Recommendations:

- Research and Education, Health
- Quality of Life
- Creating High Tech, High Paying Jobs.

## EDGE Action Plan:

- create a \$1 billion Research Endowment
- earnings to support research and tech transfer to Oklahoma's private sector
- creation of a lottery that will provide support for college scholarships, campus technology needs and the Endowed Chairs program

# Research Capital of the Plains

- **EDGE Program**
- **Capital Bond, HB1191**
- **National Lambda Rail**
- **University technology transfer policies**
- **I2E, IP commercialization**
- **Oklahoma Nanotech Initiative (ONI)**



Brad Henry  
Office of the Governor  
State of Oklahoma

July 9, 2004

Frank Waxman, Ph.D.  
Director, Oklahoma EPSCoR  
Oklahoma State Regents for Higher Education  
655 Research Parkway, Suite 200  
Oklahoma City, OK 73104

Dear Frank:

It is my pleasure to write this letter in strong support of your Research Infrastructure Improvement grant application to the National Science Foundation. As you know, my administration places a high priority on the connection between economic development and research at our universities and research foundations. This commitment is embodied in the first recommendation of our EDGE Plan, which is to create in Oklahoma the "research capital of the plains" with a one billion dollar endowment for research. The EDGE Plan also commits the state to improving its educational infrastructure.

# Federally financed academic R&D expenditure, 2002 (NSF)

National change, 1990-2002.....+126.5%

Oklahoma change, 1990-2002.....+194%

Oklahoma share, 1990 to 2002  
0.04% to 0.51%

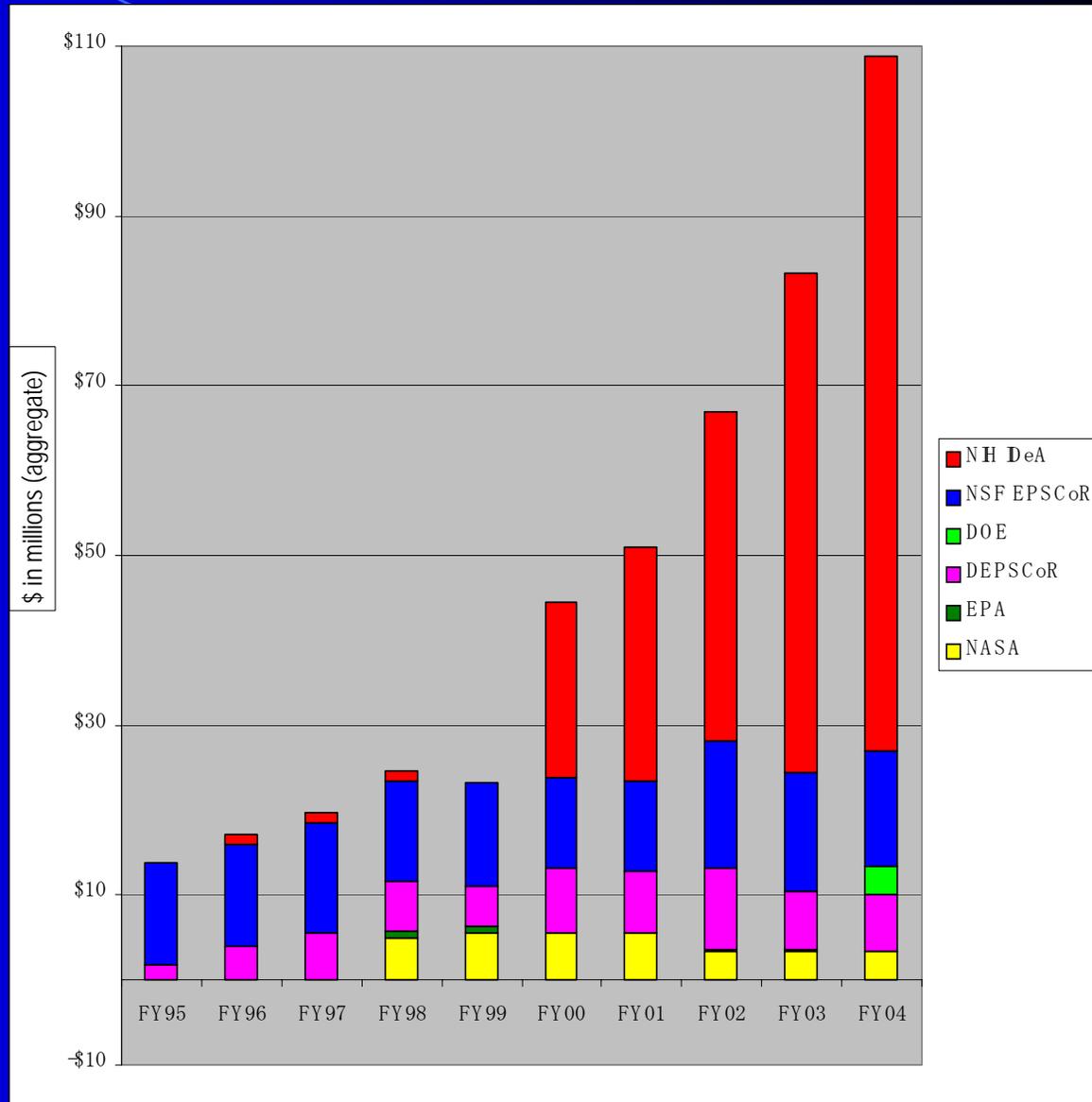
# Federally financed academic R&D expenditure, 2002 (NSF)

Percent change among states of similar size, 1999-2002

<u>Rank</u>	<u>State</u>	<u>Share Change</u>
1	MI	89.9%
2	SC	64.8%
3	KY	62.3%
4	KS	51.4%
5	IA	44.6%
6	CT	36.8%
7	AK	35.5%
8	OK	27.0%
9	OR	18.9%

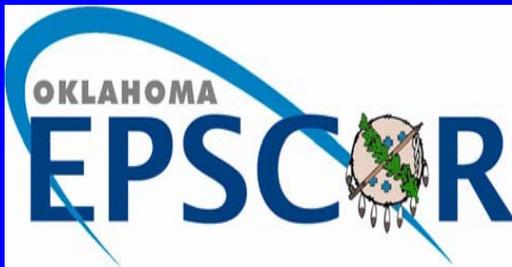
# Active Oklahoma EPSCoR Awards

- **\$13.5 million - NSF EPSCoR FY02**  
Research Infrastructure Improvement Award
- **\$64 million - NIH IDeA FY00, FY02, FY03, FY04**  
Centers of Biomedical Research Excellence (COBRE)
- **\$17.95 million - NIH IDeA FY 04**  
IDeA Network of Biomedical Research Excellence (INBRE)
- **\$6.7 million – DEPSCoR FY02, FY03, FY04**
- **\$3.4 million – DOE EPSCoR FY04**
- **\$3.3 million - NASA EPSCoR FY01**



# Return on Investment

Since FY00, the Oklahoma State Regents for Higher Education have invested \$8.8 million for new EPSCoR projects, leveraging \$25.5 million in federal EPSCoR and IDeA funding. University participants in Oklahoma EPSCoR programs over this time period have invested \$5.3 million towards EPSCoR projects in Oklahoma. An additional \$83 million in federal funds were also awarded to Oklahoma where no state commitment was required, bringing the five-year award total for Oklahoma EPSCoR to over \$122 million.



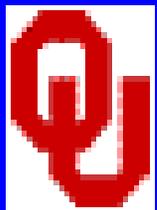
# NSF Research Infrastructure Improvement Award 2005 – 2008 - \$9.0 Million

## NanoNet – Oklahoma Network for Nanostructured Materials

The Nanoscale Materials Research theme will include four related Interdisciplinary Research Groups (IRGs): Carbon Nanotubes, Novel Nanoscale Devices, Fuel Cells and Interfaces of Nanomaterials and Biomaterials.

## Plant Virus Biodiversity and Ecology

This program will build on previous NSF EPSCoR support for genomics, bioinformatics and Oklahoma's unique Mesonet system, which provides comprehensive environmental data. The study will use Oklahoma's pristine, never-cultivated Tallgrass Prairie Preserve and will address basic questions in the ecology and diversity of viruses.



## Oklahoma EPSCoR

# NSF Research Infrastructure Improvement Award Research Highlights (cont'd)

**“Extraordinary Narrow Distribution of Single-Wall Carbon Nanotubes”, *Daniel E. Resasco*, University of Oklahoma—Very narrow distributions of the diameter and chirality of single-wall carbon nanotubes have been produced using a cobalt-molybdenum catalyst process . Spin-out company SouthWest NanoTechnologies, Inc. (SWeNT™)**

### ***Potential Applications:***

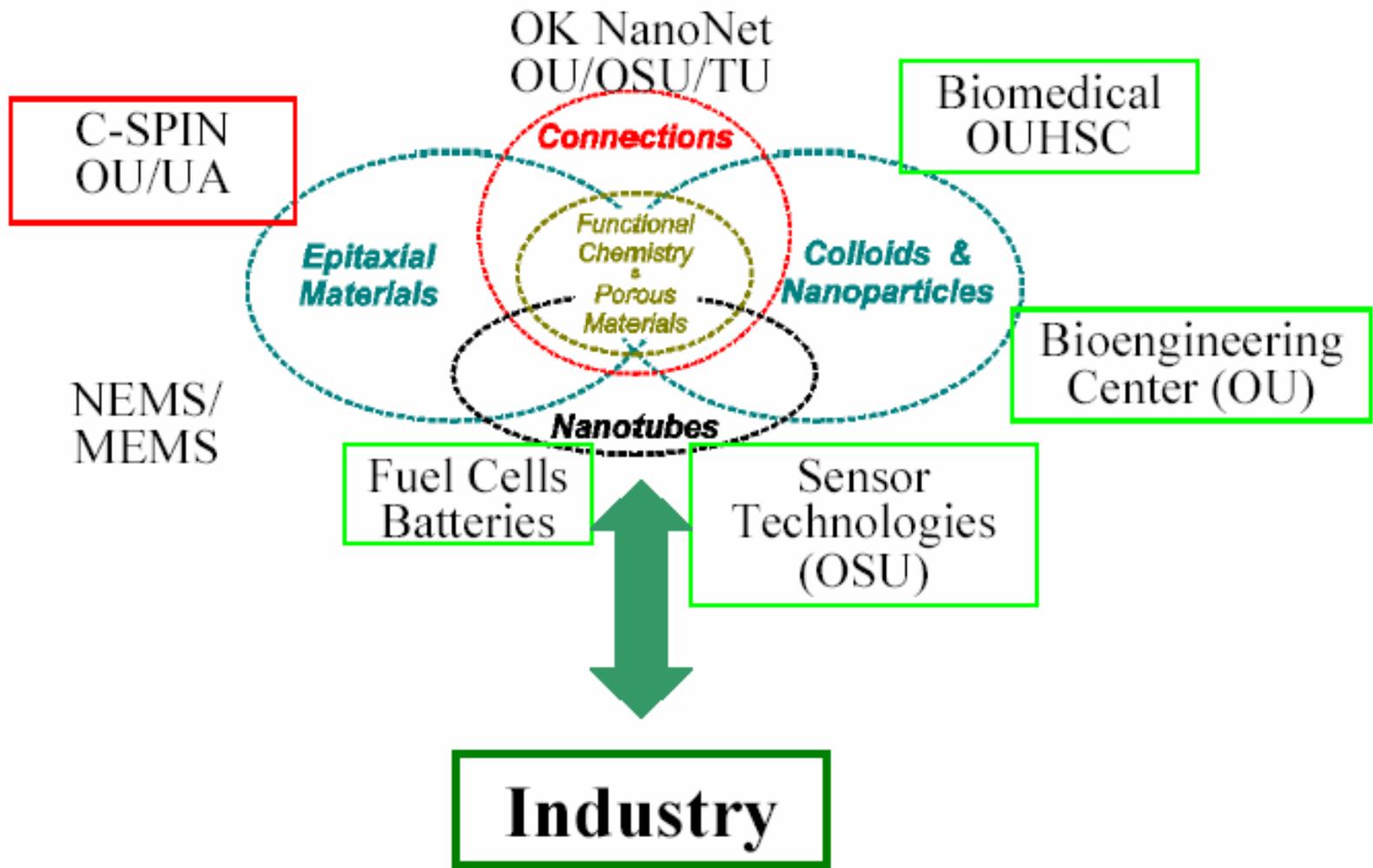
- Hydrogen fuel cells
- Photovoltaics

**Oklahoma EPSCoR  
NSF Research Infrastructure Improvement Award  
NanoNet (Fuel Cells)**

*Research Objectives:*

- Improve platinum catalysts on SWNTs
- Durable highly conducting membranes
- More stable electrode/membrane contacts
- Complete fuel cells

# Nano Activities in Oklahoma





The **Center for Semiconductor Physics in Nanostructures** is an interdisciplinary collaboration between the [University of Arkansas](#) and the [University of Oklahoma](#). The quest to improve computing power, data storage, and communication speed demands new approaches to device fabrication and new materials systems. Our mission is to develop ways to create and probe structures on the nanometer scale, study their individual and collective dynamics, and explore their use in next generation electronic, optical and chemical systems.



The **Oklahoma Technology & Research Park** will be home to a variety of advanced technology and knowledge based companies

*Important focus areas are:*

- **Sensor and Sensor-Related Technology**
- Nanotechnologies
- Information Technology
- Agricultural Biotechnology

# A Personal Radiation Dosimeter:



## The Landauer POSL Badge:

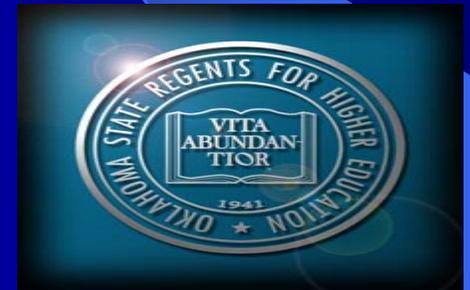
“LUXEL”™

Badges worn by radiation workers world-wide.

World's largest radiation dosimetry service provider.

>1,000,000 badges per month.

# Oklahoma EPSCoR Partnerships



# Oklahoma Center for High Energy Physics Research

A DOE EPSCoR IMPLEMENTATION GRANT CENTER OF EXCELLENCE

## Participating Institutions

- Oklahoma State University
- Langston University
- University of Oklahoma

## Goals

**Leadership in High Energy Physics Research integrating OSU, OU & LU efforts as one strong entity.**

**Establish a Regional Grid Computing Facility for High Energy Physics and connect to industry via IT development and transfer.**

**Education and outreach for Oklahoma students and teachers in science and technology via HEP research.**



# OKLAHOMA EPSCoR

## Oklahoma City Office

Frank Waxman, Ph.D., Director EPSCoR,  
INBRE Principal Investigator  
Dawn Scott, Administrative Coordinator  
Sasha Smith, Staff Assistant  
Shelley Wear, Special Programs Coordinator  
Sandy Cunningham, Fiscal Analyst

655 Research Parkway, Suite 200  
Oklahoma City, OK 73104  
405.225.9459  
Fax 405.225.9230

## Stillwater Office

Jim Wicksted, Ph.D., Associate  
Director EPSCoR  
Director, DOE Epscor  
Valerie Pogue, Program Manager  
Patricia Greer, Administrative Asst.  
Pravina Kota, Web Specialist

225C Noble Research Center  
Stillwater, OK 74078-3033  
405.744.9964  
Fax 405.744.7688

## Oklahoma EPSCoR Websites

<http://okepscor.org>  
<http://www.okinbre.org>  
<http://epscor.nasa.ou.edu>