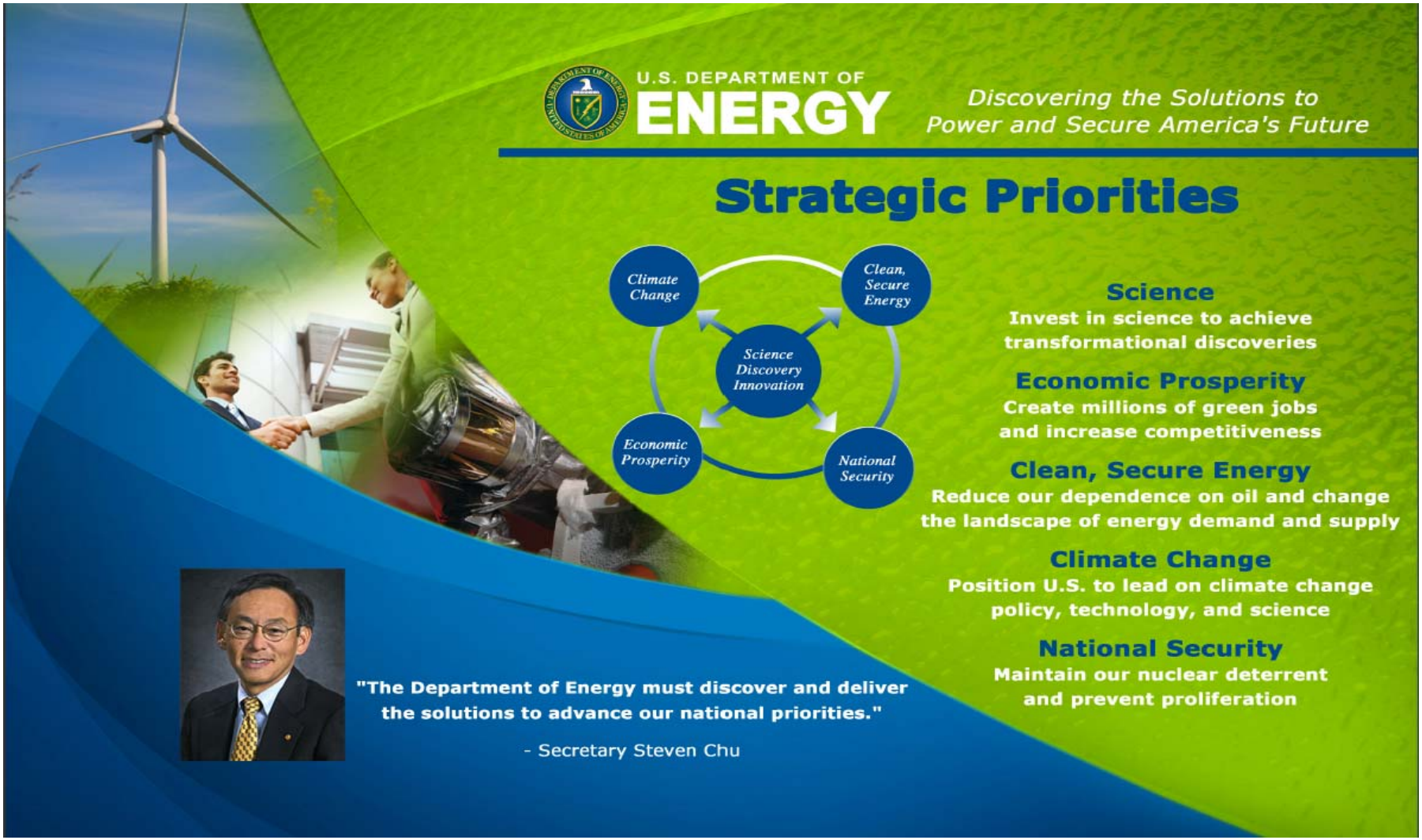
Incentivized Competitions and Prizes

October 19, 2009

Strategic Priorities



National security, environmental and economic goals form the basis for a robust National Energy Policy but historical data demonstrates the magnitude and urgency of the challenge.

Energy Security

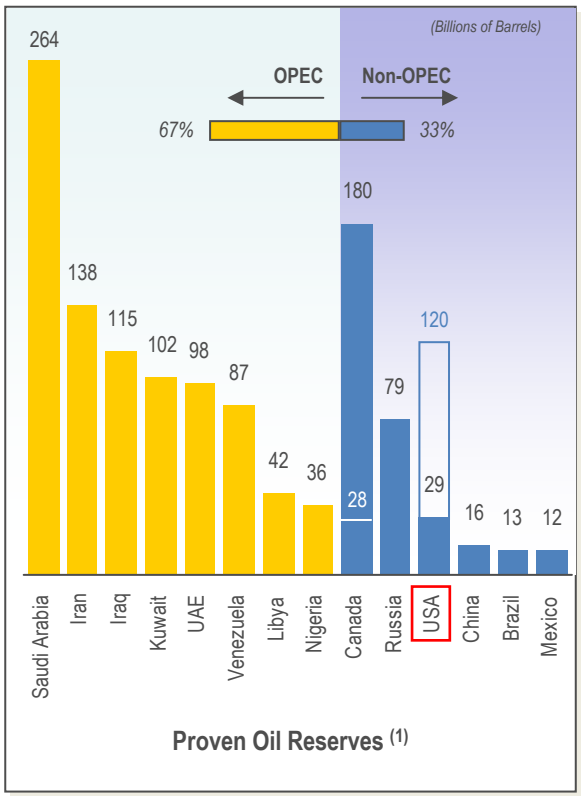
- *Diversify our energy mix and reduce dependence on petroleum*

Environmental Stewardship

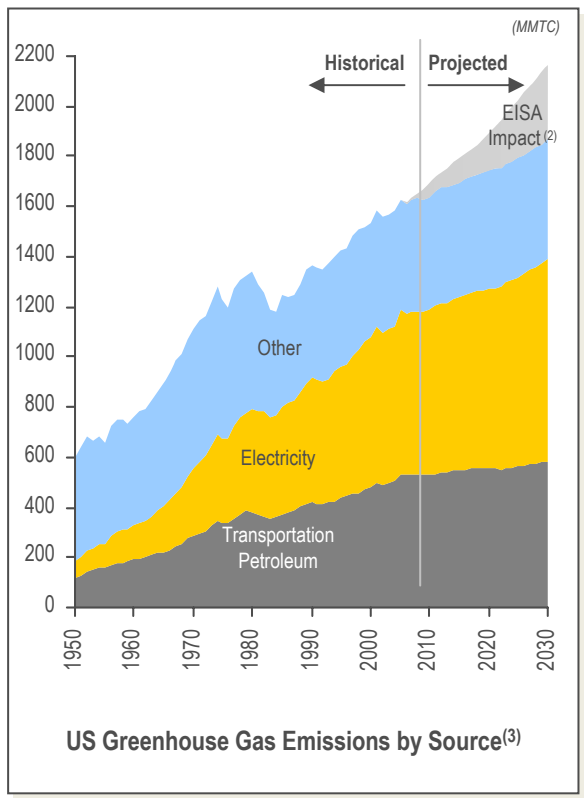
- *Reduce greenhouse gas emissions and other negative environmental impacts*

Economic Competitiveness

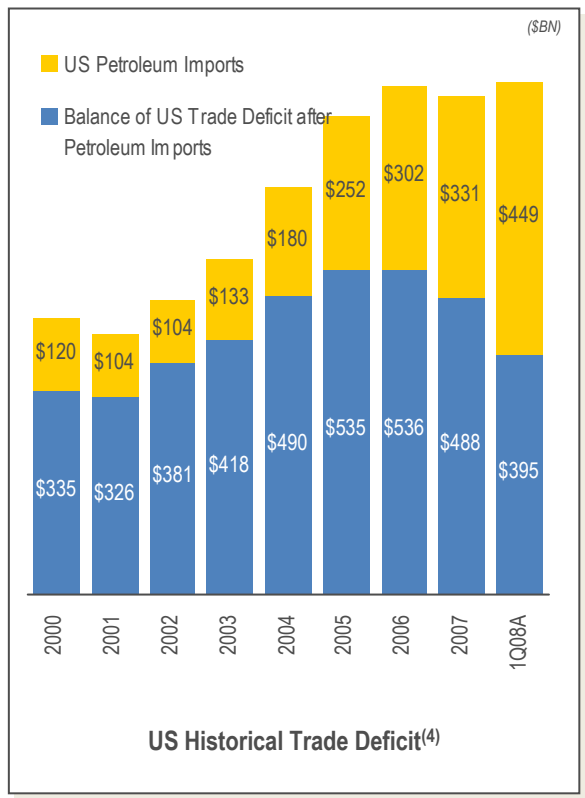
- *Create a more flexible, more reliable and higher capacity U.S. energy infrastructure*
- *Improve the energy productivity of the U.S. economy*



Proven Oil Reserves (1)



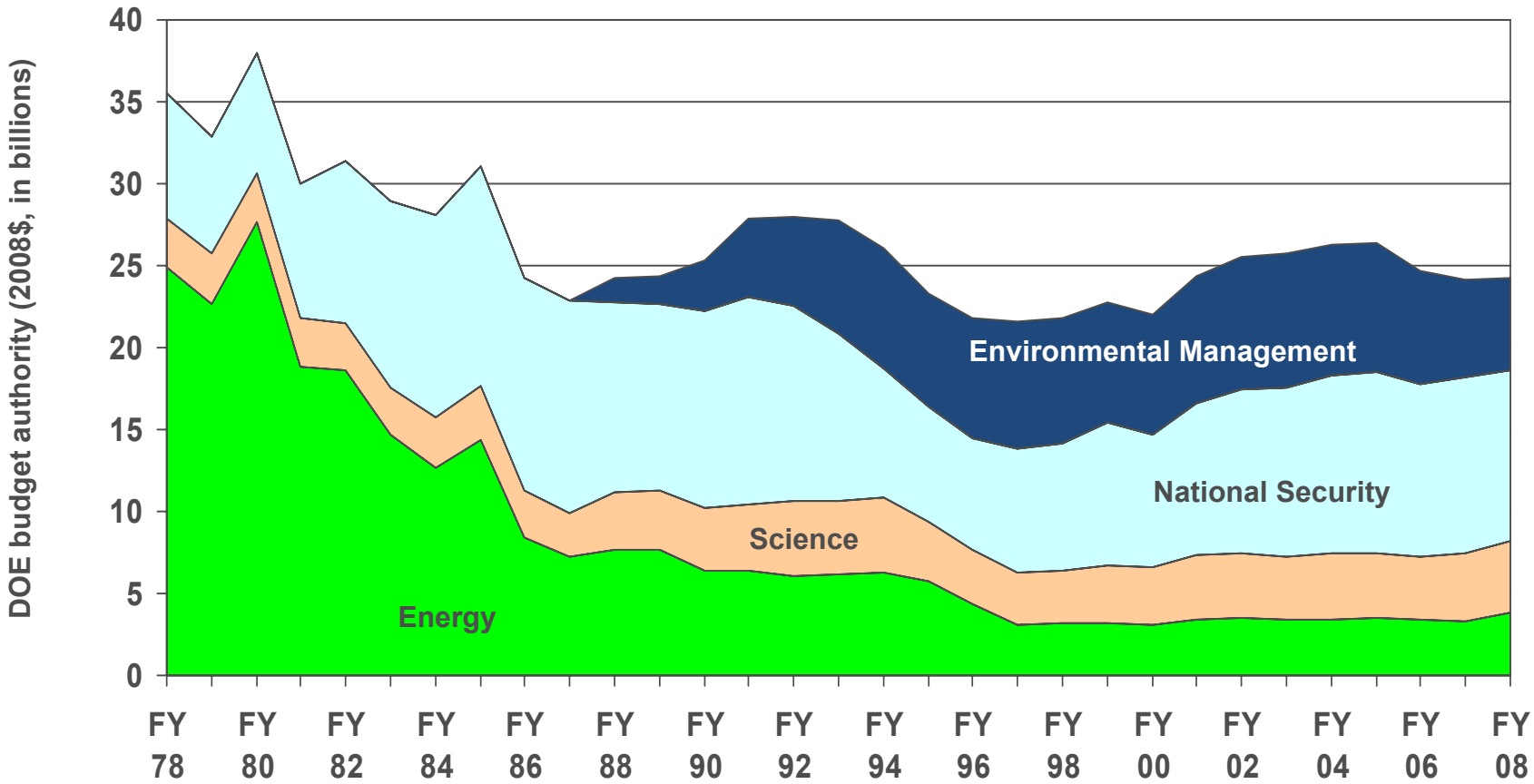
US Greenhouse Gas Emissions by Source(3)



US Historical Trade Deficit(4)

(1) Source: BP Statistical Review of World Energy, June 2008. Note: Includes 152 BN barrels of Canadian Tar Sands. Higher USA figure includes 86 BN barrels and 4 BN barrels in the Outer Continental Shelf and Arctic National Wildlife Refuge, respectively according to EIA. Only top producing nations shown.
(2) Difference between 2007 and 2008 American Energy Outlooks largely attributable to the passage of the Energy Independence and Security Act of 2007 signed by President Bush in December 2007.
(3) Source: American Energy Outlook 2008, Energy Information Agency.
(4) Source: US Department of Labor, Bureau of Economic Analysis, International Transactions Accounts. Note: 2008 annualized from Q1 data.

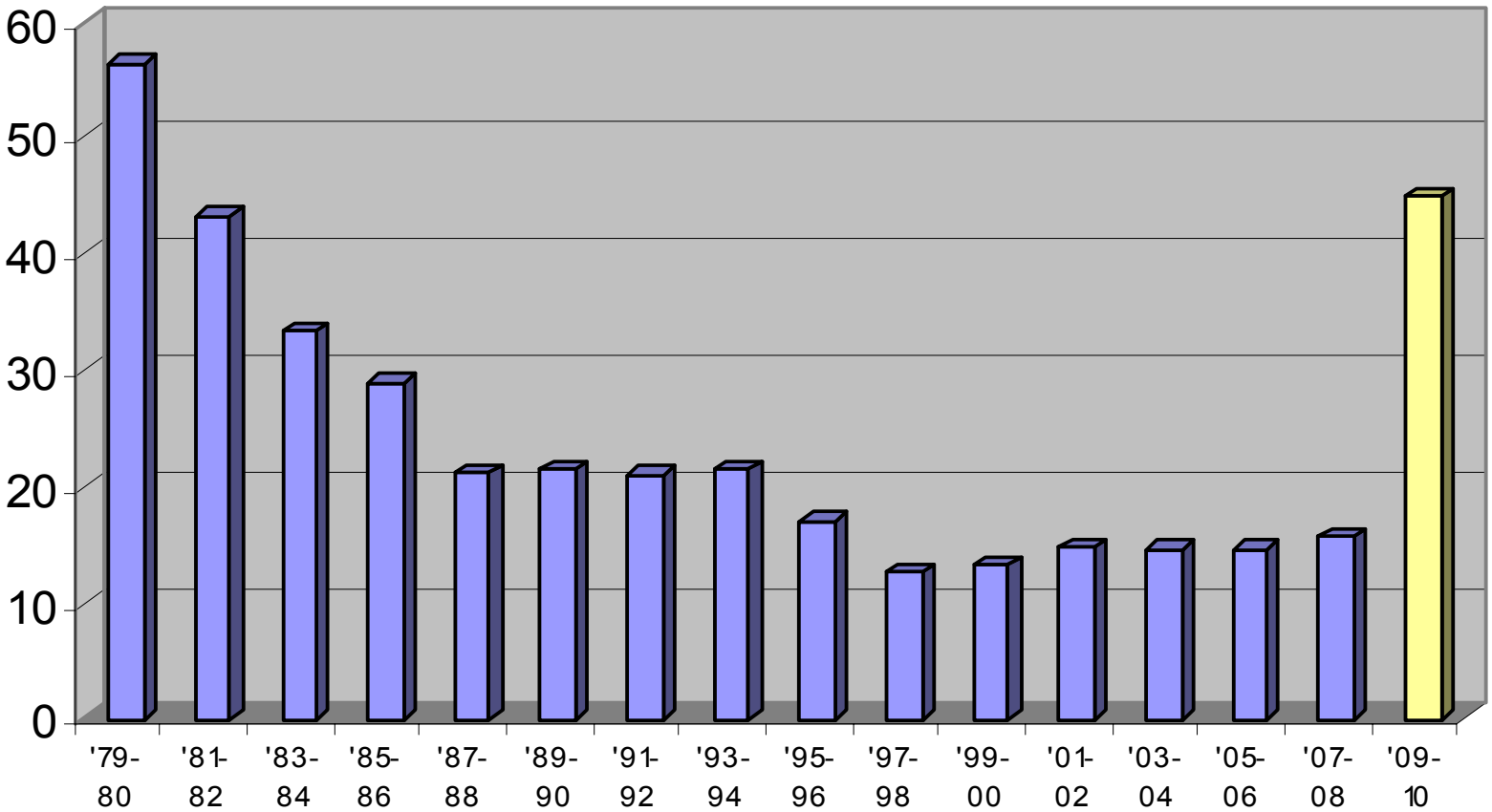
DOE Historical Budget



Note: FY07 data based on revised request
FY08 data based on request

DOE Historical Funding for Science & Energy

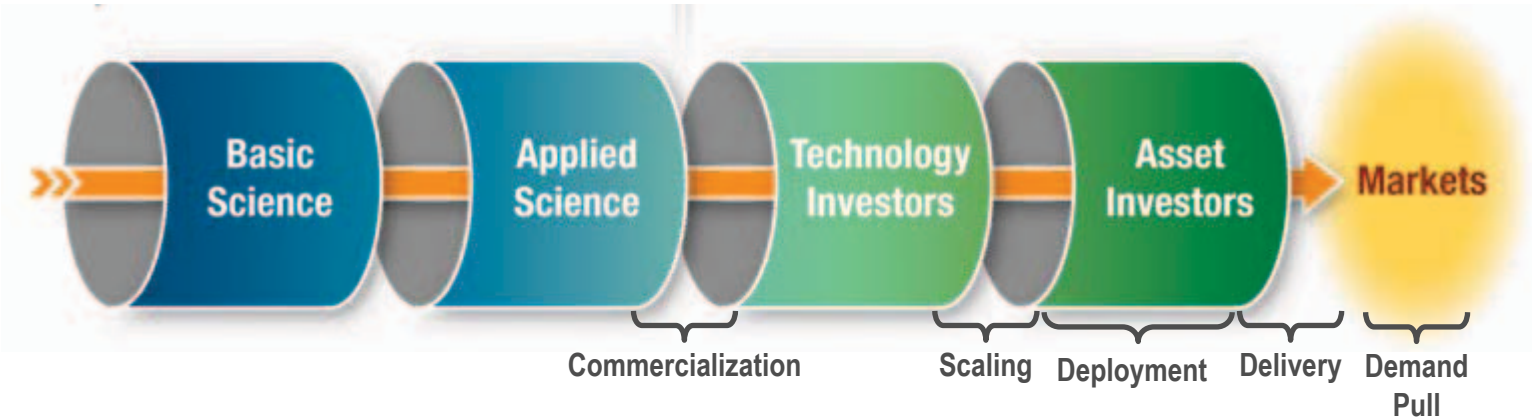
(Constant FY 2008 dollars)



Major increases in Science and Energy in FY 2009 and FY 2010

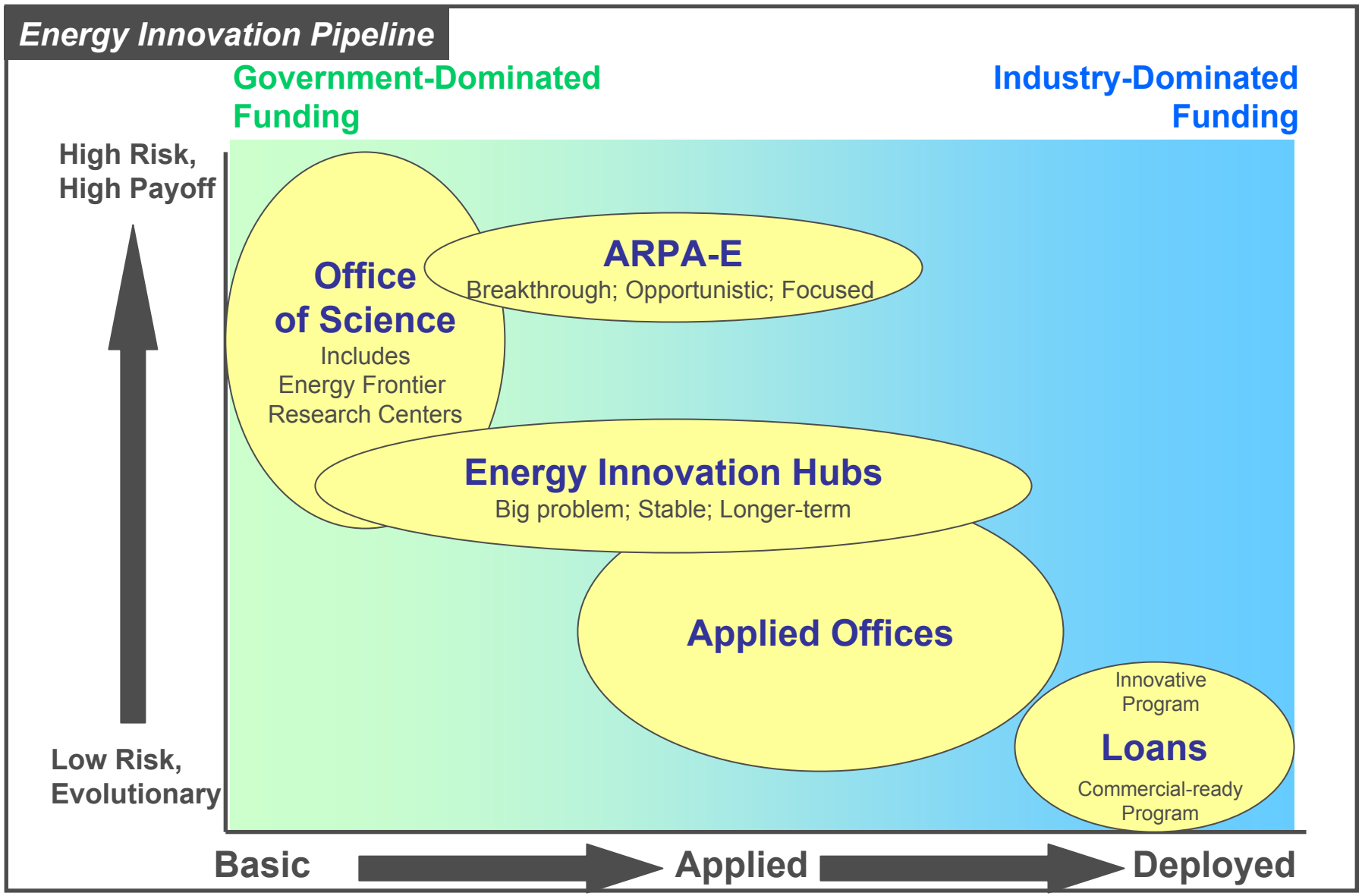
Note: 2009-10 includes $27 billion in Recovery Act

Innovation Pipeline



Public benefit is only fully realized upon product delivery to market

Energy R&D Pipeline



DOE is uniquely positioned to promote open collaboration and incentivized competitions

- Open collaboration
  - Traditionally DOE highly secure, clearance heavy, secret
  - Private sector often incentivized to protect trade secrets, patents and IP to the detriment of moving industry forward
  - Today DOE promotes open collaboration
- Incentivized competition
  - DOE leverages research and investment dollars by supporting and promoting competitions

DOE looks to tap into American ingenuity, creativity, and spirit to identify alternatives and create momentum to shift away from oil

Incentivized competition drives innovation

- **Competition breeds excellence and is disruptive to the status quo**
  - Incumbents are best challenged by amplifying results. Our national energy status quo is in need of the type of disruption that only competition and ingenuity can bring.

- **DOE has a track record** of using prizes
  - Spur innovation towards achieving our national goals.

- **Prizes Work**
  - Prizes recognize that the best thinking tends to happen not in Washington or even in a laboratory.

Prizes – Vehicles

- **Challenge X**
  - 17 teams from North American Universities were challenged to re-engineer a GM Equinox to minimize energy consumption, emissions, and GHGs while maintaining or exceeding the vehicle's utility and performance.

- **EcoCar: The NeXT Challenge**
  - Next generation of Challenge X: 3 year competition with Year One Competition Finals occurring this week in Toronto.
  - Students design and build advanced vehicles that demonstrate leading-edge automotive technologies with the goal of minimizing the environmental impact of personal transportation following a real-world approach.

- **Progressive Automotive X PRIZE**
  - International competition to design, build and bring to market 100 MPG vehicles with a $10 million prize

- **Hydrogen Storage H-Prize**
  - Demonstrate development of an on-board material that meets or exceeds defined performance criteria with an $1 Million Prize expected in October 2010

Prizes – Buildings

- **Building America: The Builder's Challenge**
  - Builders who join the Builders Challenge will commit to constructing homes that rate 70 or better on the EnergySmart Home Scale – that is 30% better than typical new home and almost 2x as efficient as an existing home!
  - By constructing 220,000 homes to 70 on the E-Scale by 2012, participating builders will take the equivalent of 50,000 passenger cars off the road for an entire year and will save homeowners $143 million on their energy bills.

- **Solar Decathlon**
  - 20 international university teams compete to design, build, and operate the most livable, energy-efficient completely solar-powered house.
  - The 2007 Solar Decathlon crowned the Technische Universität Darmstadt the overall winner.

- **L Prize**
  - Challenges industry to develop high-performance solid-state lighting products to replace two of today's most widely used and inefficient products: 60W incandescent and halogen light bulbs.

L•Prize

Solar Decathlon is a global leader incentivized competition

- **Purpose**
  - The Solar Decathlon brings attention to one of the biggest challenges we face—an ever-increasing need for energy. As an internationally recognized event, it offers powerful solutions—using energy more efficiently and using energy from renewable sources.
  - In 2007, 20 international university teams competed to design, build, and operate the most livable, energy-efficient completely solar-powered house. Technische Universität Darmstadt was crowned the overall winner.

- **2009 Solar Decathlon Contests**
  - Architecture
  - Market Viability
  - Engineering
  - Lighting Design
  - Communications
  - Comfort Zone
  - Hot Water
  - Appliances
  - Home Entertainment
  - Net Metering

Prizes – Business Plans

- **California Clean Tech Open**
  - From the past three years, 84% of the Alumni are still viable businesses and have secured more than $125 million in funding, while the prize levels top out at $100,000.
- **Global Venture Challenge**
  - Hosted by Oak Ridge National Laboratory, students develop unique and innovative product ideas that can solve existing market needs and have the potential to become sustainable businesses.
  - The event theme for 2009 is Industrial Energy Efficiency and is sponsored by the U.S. Department of Energy's Industrial Technologies Program.
- **MIT Clean Energy Entrepreneurship Prize**
  - Stimulates relationships between academic, community, industry, and government organizations to meet the world's energy challenge through innovation and entrepreneurship.

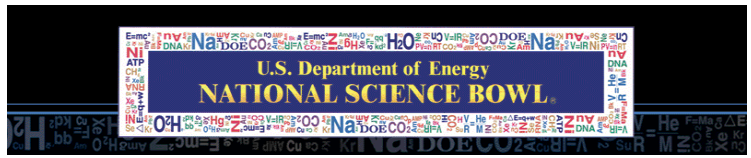
Future Prizes

- Freedom Prize
  - Focus on strategies to deploy **existing technologies** and to encourage changes in **processes, policies, and behavior** to reduce our dependence on oil
  - Tap into American ingenuity, creativity, and spirit to identify alternatives and create momentum to shift away from oil
  - The first competition will focus on school bus fleets, with $1.5 million in awards for innovative strategy and technology changes that have a lasting impact.
  - Schools Fleet Challenge launch target is Fall 2009

Prizes – K-12 Education

- Ad Council
  - Students create and produce multi-media ads about energy efficiency and place on YouTube. 800,000

- Science Bowl
  - HS Students answer questions on topics in astronomy, biology, chemistry, mathematics, and physics in a highly competitive, Jeopardy-style format. Middle School students also design, build, and race hydrogen fuel cell model cars. 2,300,000



QUESTIONS ?

Prizes – K-12 Education

University level (4 competitions; 1 Awareness campaign)

- Hydrogen Student Design Contest (160 students)……$20,000.
  Students design a real-world hydrogen application; themes have included hydrogen fueling station, hydrogen power park, hydrogen and fuel cell technologies at airports, and hydrogen and fuel cell technologies on a college campus.
- Solar Decathlon (400 students)…….……$ 4,450,000.
  University students compete by building 800 square foot solar efficient homes.
- Eco Car Competition (150 students) …….. $2,000,000
  Three-year competition to reengineer a crossover vehicle provided by GM that reduces fuel consumption and lowers emissions by using advanced vehicle technologies, such as: plug-in hybrid technology, hybrid technology, diesel technology and other advanced fueling technologies.
- Global Venture Challenge ……$200,000.
  Student business competition focused on Industrial Energy Efficiency technologies (www.globalventurechallenge.com)
- Smart Power Energy Efficiency Campaign (20,000 students)….$200,000.
  Social media campaign to link America's Greenest Campus and a YouTube Ad Contest through letsgetenergysmart.com, teens and young adults can compete through their universities or through video to save energy and reduce greenhouse gas emissions.

K-12 level: (3 Competitions)

- Automotive X PRIZE Competition (new competition)…… $3,500,000.
  National Education/Outreach about advanced, energy-efficient vehicles with 3 integrated activities: 1) on-line knowledge center -- www.fuelourfuturenow.com, 2) development of a vehicle telemetry package and integration of that package with the AXP online knowledge center, and 3) national content where students design a next-generation Dashboard.
- Ad Council ……$800,000
  Students create and produce multi-media ads about energy efficiency and place on YouTube.
- Science Bowl……$2,300,000.
  HS Students answer questions on topics in astronomy, biology, chemistry, mathematics, and physics in a highly competitive, Jeopardy-style format. Middle School students also design, build, and race hydrogen fuel cell model cars.

ESD.172J / EC.421J X PRIZE Workshop: Grand Challenges in Energy

Fall 2009