



Where is the Money?



Take Always



- The government has always supported research
- There is a paradigm shift in the types of problems the country is trying to solve
- Research is growing in strategic areas
- The federal government spent over a trillion dollars last year on good and services
- Working with the government is an excellent mechanism for facilitating open innovation
- 2011 will be an extremely good year to pursue research funds and procurement

Agenda



- Why the Government Supports Technology
 - Where the R&D Funds are Today and in the Future
 - Funds for Clean Air
 - Open New Sales Channels
 - Facilitating Open Innovation
 - Questions

Fed. Gov. R&D Investment



- National security and economic development
- WW II changed everything
- In the 1990's 80% of the R&D had gone to health and defense
- In recent years there has been a paradigm shift to sustainability
- Focus on energy and sustainability



Examples of Major Government Initiatives



- **The Internet**
- **Nanotechnology**
- **Human Genome Program**
- **Stem Cell Research in California**
- **Alternative Energy and Sustainability**



Potential Fits for For-Profit Companies



- R&D Funding
- Product Sales
- Capital Projects
- Tax Credits

Agenda

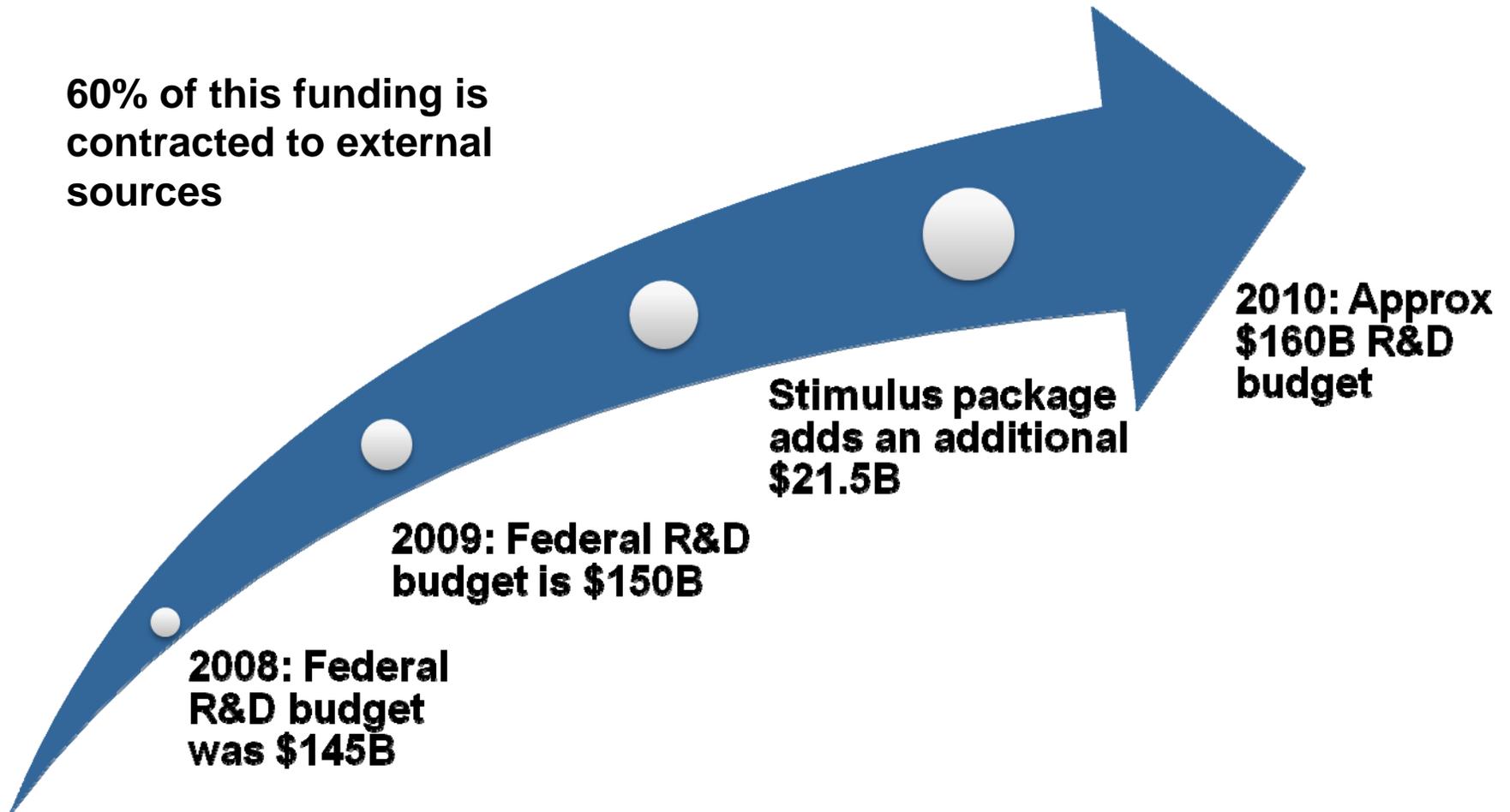


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Market Size



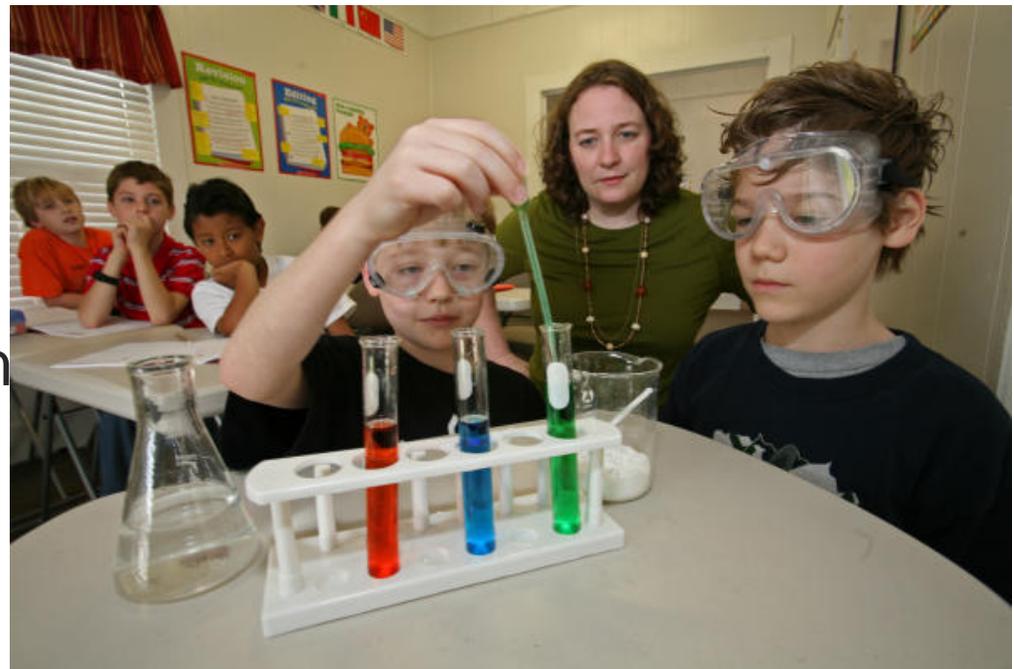
60% of this funding is contracted to external sources



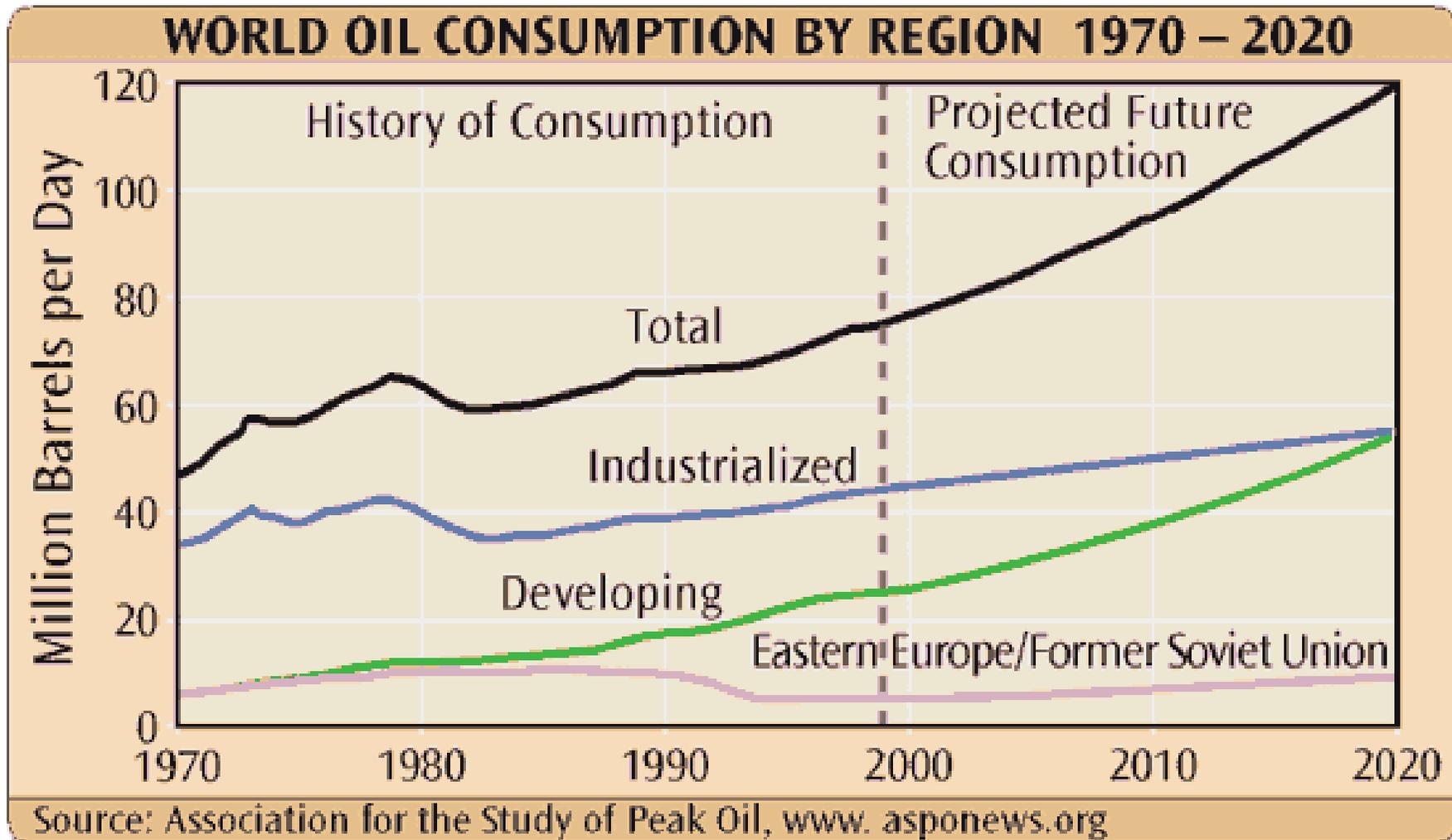
Paradigm Shift



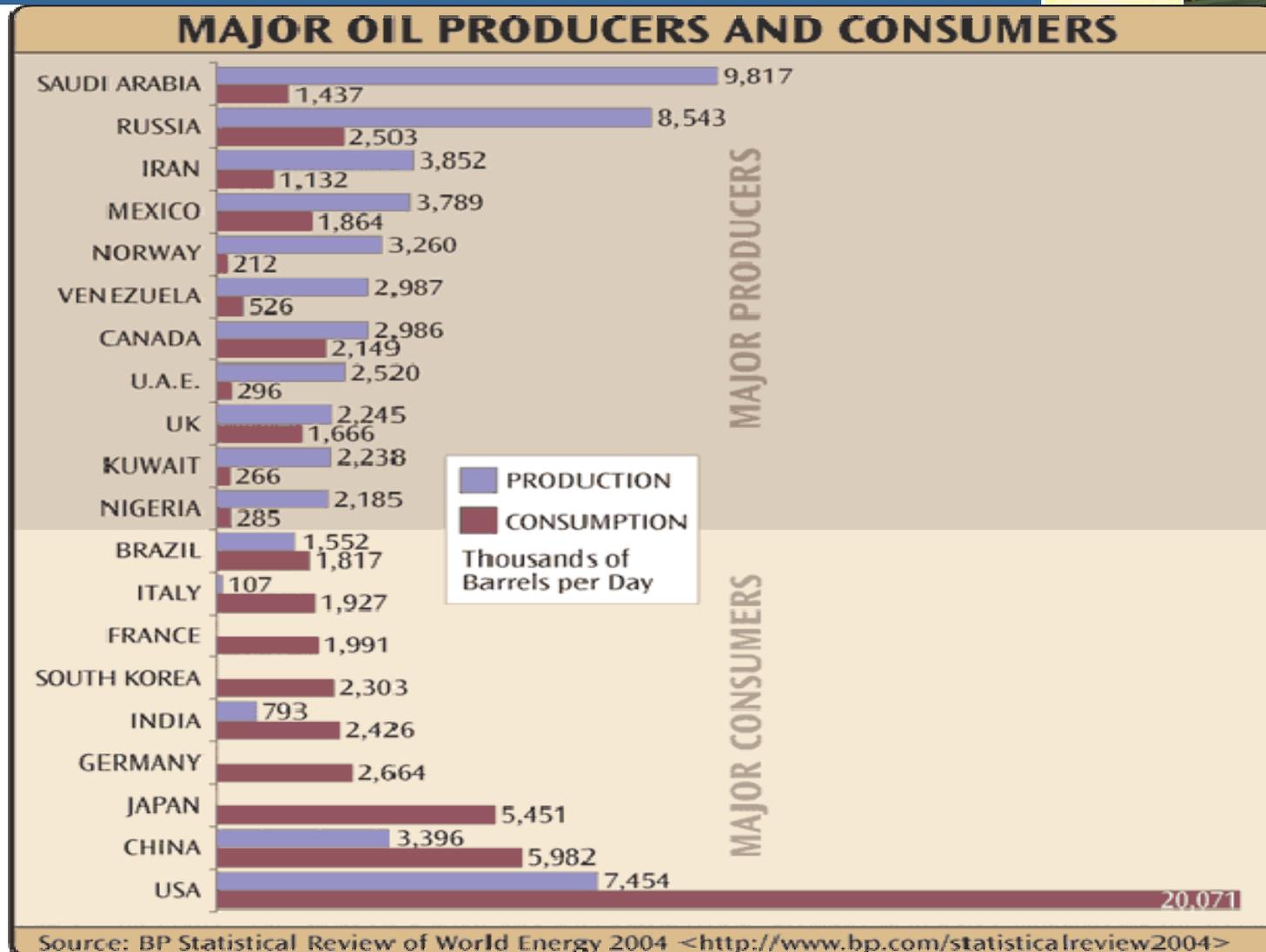
- Rising Above the Gathering Storm – America Maintaining their Competitiveness
 - Focus on core science
- Cost of Healthcare
- Lag Telecommunication
- Challenge with Assets
 - Energy
 - Water
 - Food



Projected Oil Consumption



Production vs. Consumption



Energy Efficiency and Renewable Energy Projects



- Applied R&D \$2500 MM
- Biomass \$800MM
- Geothermal \$400MM
- Research to improve efficiency \$50MM
- Energy Efficiency Block Grants \$3,200MM
- Weatherization Assistance \$5,000MM
- State Energy Programs \$3,100MM
- Advanced Battery Manufacturing \$2,000MM
- Alternative Fuel Vehicles Pilot Grant \$300MM
- Appliance Rebate \$300MM
- Research Electricity Delivery \$4,500MM
- Training \$100MM
- Fossil Energy R&D \$3,400MM
- Fossil Energy R&D Programs \$1,000 MM
- Clean Coal Power Initiative \$800MM
- Carbon Capture Energy Efficiency Imprv'mts. \$1,520MM
- Resource Assm't. of Future Demand \$80MM
- Implement section 1305 of Public Law 110-140 \$10MM
- Non-Defense Environmental Cleanup \$0 \$483
- Uranium Enrichment Decontamination \$390MM

State Awards



- **Georgia** – 2 plants for a major paper company. Projects included: No. 2 Paper Machine Dryer Venting Reduction, No. 3 Evaporator Reconfiguration Reduces Carbon Footprint, Energy Savings Digester Screen Project. \$700,000
- **Illinois** – A major materials company established a large customer energy efficiency program. \$800,000
- **Kentucky** - ARRA energy grant (Industrial Facility Retrofit Showcase) for a major paper company= \$400,000
- **Mississippi** - ACE training grant through the Development Association for a major materials company. \$225,000

DOE AWARDS



 **BASF**

The Chemical Company

BASF Receives DOE Funds to Build North America's Largest Lithium-Ion Materials Production Facility:

\$24.6 million grant from the Department of Energy (DOE) under the ARRA- Electric Drive Vehicle Battery and Component Manufacturing Initiative. The DOE funds will be applied to construction of BASF's new lithium-ion battery materials production facility in Elyria, Ohio.



Chemtura Corporation: develop, test and bring to market new synthetic lubricants **\$1,452,140**



Novomer:

The US Department of Energy has awarded **\$2.1 million** in stimulus funds to Novomer Inc., a Waltham company that makes plastics and coating materials out of carbon dioxide, a greenhouse gas that many believe contributes to climate change.



Soladigm, Inc.

Manufacture low-cost, dynamic windows **\$3,467,541**



Phononic Devices, Inc-- A new class of high efficiency thermoelectric devices and materials that use thermally insulating semiconductors with high thermal-to-electric conversion efficiencies. **\$3,000,000**



ITN Energy Systems, Inc - Solid-state electrochromic film on plastic substrates with roll-to-roll production process **\$4,986,249**



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Funding to Support Clean Air Initiative



- **Core Activities (\$37.4 million)** – The additional funds will support continuing program responsibilities and the increased workload that state and local air agencies face as EPA updates its health-based NAAQS.
- **Increasing Capacity for Greenhouse Gas Permitting (\$25 million)** – State and local agencies must continue to expand their capacity to issue greenhouse gas (GHG) permits for new and modified sources under the “Prevention of Significant Deterioration” program and Title V operating permits.
- **Support for the Greenhouse Gas Reporting Rule (\$1.5 million)** – The President’s proposed budget includes funding to assist state and local agencies in the collection, review, analysis and use of greenhouse gas registry emissions data and linking state-based reporting systems to EPA’s new system.
- **Monitoring (\$15 million)** – State and local agencies must increase monitoring activities to address new and revised standards for ozone, lead, NO₂ and SO₂. Additionally, more monitoring of hazardous air pollution is needed in locations where the public lives, works, attends school and carries out daily activities. These efforts require purchasing additional ambient air monitoring equipment that provides essential information about the levels of pollutants in the air and, later, the success of control measures.

Federal Solicitations



- **Air Force: BAA for Innovative Technologies and Methodologies for Reducing Various Environmental Problems** AFCEEBA-11-002 This announcement seeks out proposals that demonstrate and validate innovative, sustainable, and cost-effective technologies and/or methodologies that will lead to accelerated closure of environmental sites across the Air Force, eliminate or reduce hazardous material use and environmental release, and serve the Air Force's future environmental needs. Includes **Pollution Prevention Program/Air Quality**: Proposals should identify new or innovative technologies or control methodologies which are expected to generate feasible but substantial reductions in air pollutants of concern. Typical proposals have focused on material substitutions, process modifications, control technologies, and equipment modifications or substitutions. Additionally, proposals may address monitoring or emission quantification methods in a manner which can reduce the frequency at which monitoring is required, or the level of AF response. Proposals should not be limited to traditional CAA criteria and hazardous air pollutants and should provide additional considerations for the reduction of greenhouse gases and emerging contaminants. Phase I
- **U.S. Army Engineer Research and Development Center (ERDC) 2011** W912HZ11BAA01 **Construction Lab Research** *Installations Division, including Inventory, Assessment, and Monitoring, Land Management, Pollution Abatement/Pollution Prevention at Industrial Operations, Compliance at Industrial Processes, Compliance at Troop Installations, Pollution Prevention. Remains in effect until superseded.
- **DOE Office of Science: FY11 Continuation of Solicitation for the Office of Science Financial Assistance Program**
DE-FOA-0000411 **Biological and Environmental Research** *Climate and Environmental Sciences Closing: September 30, 2011

Federal Solicitations



- **Navy: Engineering and Physical and Life Sciences Research and Development** N00173-11-R-SK04
The NRL has a requirement for research and development in the diverse area of Engineering and Physical and Life Sciences. *Analysis of airborne and waterborne chemicals aboard Navy Ships for life support and environmental systems; *New methods of chemical analysis and the development of novel chemical sensors for trace analysis of contaminants in a variety of matrices; *Environmental remediation, including in situ bioremediation, and site characterization efforts to detect, degrade or remove organics in ecosystems.
- **EPA: Early Career -- Extreme Event Impacts on Air Quality and Water Quality with a Changing Global Climate** The EPA, as part of its Science to Achieve Results (STAR) program, is seeking applications proposing the development of assessments, tools and techniques, and demonstration of innovative technologies for providing information and capacity to adequately prepare for climate-induced changes in extreme events in the context of air and water quality management. A goal of this RFA is to seek a better understanding of the hazards (the extreme events) and to establish ways for climate scientists, impact assessment modelers, air and water quality managers, and other stakeholders to co-produce information necessary to form sound policy in relation to extreme events and their impact on air and water quality under a changing climate. Approximately \$6M total for all awards.
- **EPA: Environmental Education Grants** The Grants Program sponsored by EPA's Office of Environmental Education (OEE), Office of External Affairs and Environmental Education, supports environmental education projects that enhance the public's awareness, knowledge, and skills to help people make informed decisions that affect environmental quality. EPA awards grants each year based on funding appropriated by Congress. Since 1992, EPA has received between \$2 and \$3 million in grant funding per year and has awarded more than 3,300 grants. Grantees are located in all 50 states and various U.S. territories. Each grant addresses one or more environmental issue, and an educational priority such as teacher training, education reform, or health. **Statistics for 1992-2009** 154 grants for Air (\$2,599,151)

Federal Technology Available for Licensing



- **Brookhaven National Laboratory– Technology for Licensing Measurement Of Hydroperoxyl Radical** The technology can be used to build an apparatus for the measurement of the elusive hydroperoxyl radicals in atmospheric samples. The atmospheric sample is treated with a liquid phase scrubbant to produce a liquid phase atmospheric sample which is subsequently reacted with the luminescent reagent and quantified using a chemiluminescent detector. **Applications and Industries** Industries which make air quality products for monitoring health and environment will find immediate use of our technology.
<http://techportal.eere.energy.gov/technology.do/techID=34> 02/03/2010
- **Lawrence Berkeley National Laboratory: Nanocatalytic System for High Temperature Reactions and Chemical Processes** Scientists in Berkeley Lab's Chemical and Materials Sciences Divisions have developed a nanocatalyst system that remains stable at temperatures up to 750°C, which includes typical operating temperatures of automobile catalytic converters as well as combustion temperatures observed in petroleum refineries. Conventional catalyst technologies do not operate at these high temperatures. **Applications and Industries**
*Petroleum refining *Hydrocarbon synthesis and partial hydrocarbon oxidation *Chemical processing *Pollution control device manufacturing *Ignition process research
<http://techportal.eere.energy.gov/technology.do/techID=122> 06/23/2010
- **Lawrence Berkeley National Laboratory: Lean Flame Stabilization Ring** Robert Cheng at Berkeley National Laboratory has developed a means for retrofitting existing burners to burn lean, premixed natural gas/air mixtures to reduce NOx emissions without sacrificing efficiency and burner design simplicity. **Applications and Industries** *Small-to-medium water heater and forced-air furnace retrofits *Reduction of air pollution
<http://techportal.eere.energy.gov/technology.do/techID=143> 07/28/2010

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Buying Green



The Federal government is the single largest consumer in the world. In 2010 they spent over \$1 trillion dollars

Green Mandates

- Resource Conservation and Recovery Act, Section 6002
- Farm Security and Rural Investment Act, Section 9002
- Greening the Government through Waste Prevention, Recycling, and Federal Acquisition (Executive Order 13101)
- Leadership in Environmental Management (Executive Order 13148)
- Strengthening Federal Environmental, Energy, and Transportation Management (2007), Executive Order 13423
- Federal Acquisition Regulation: Subparts 23.2, 23.4, 23.7, 23.8 and Parts 7, 11, 12, and 13



The Challenge

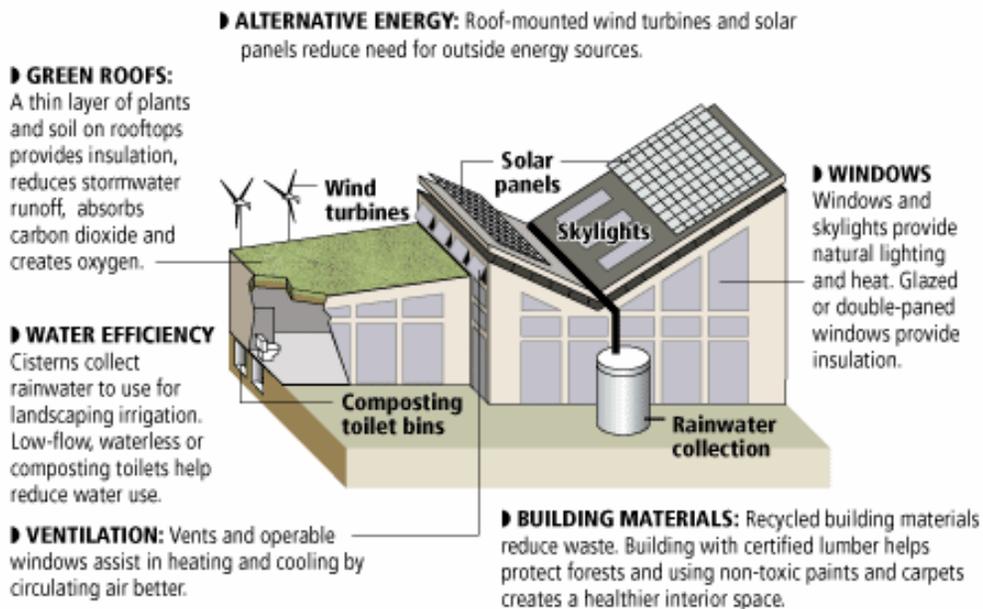


- Buildings in the US are responsible for:
 - 39% of CO2 emissions
 - 40% of energy consumption
 - 13% of water consumption
 - 15% of GDP
- Federal Government owns or leases over 500,000 buildings with a total floor space of over 3.3 billion square feet

Green Building Opportunity



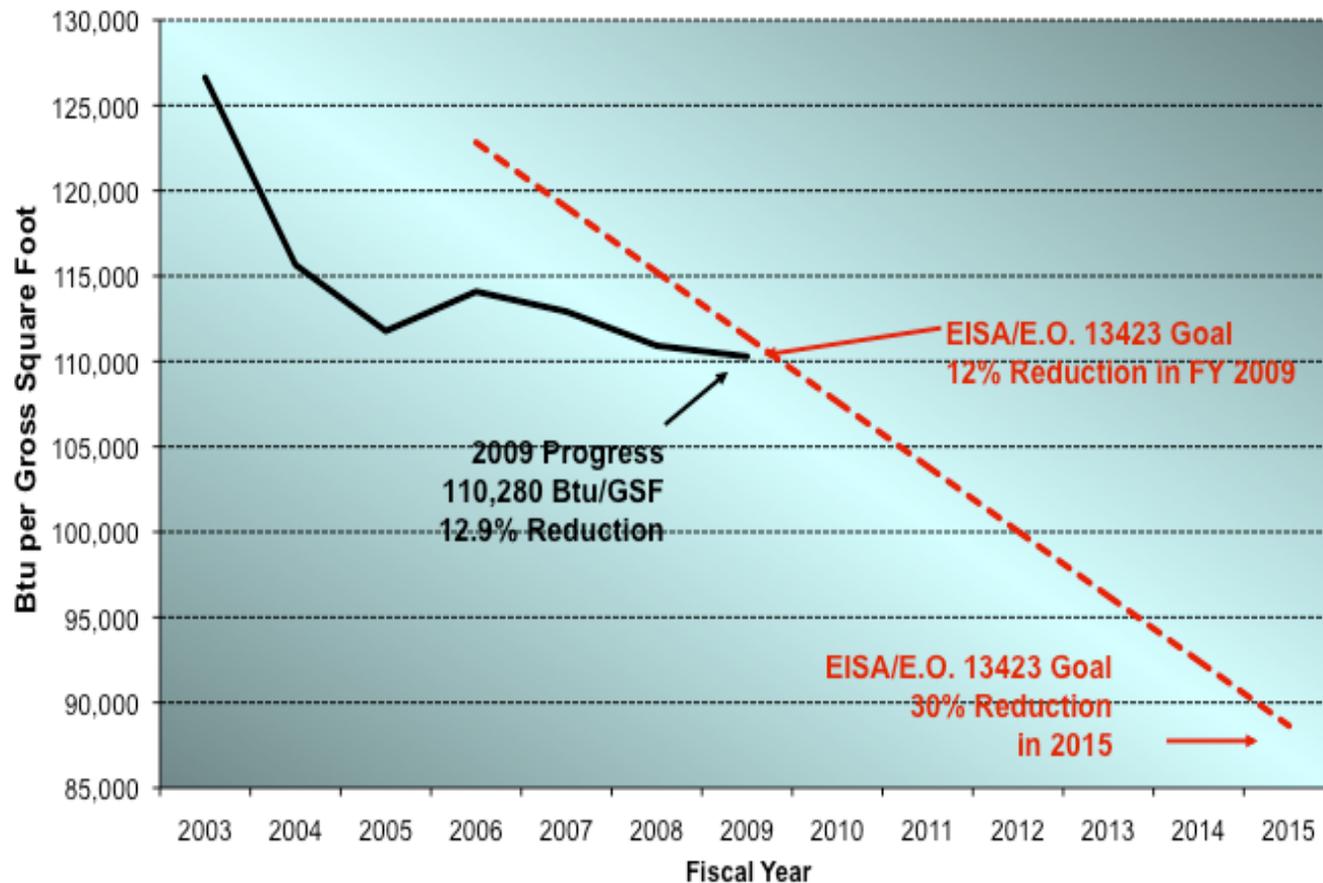
ECOFRIENDLY CONSTRUCTION



Executive Order 13423 requires that federal acquisition of recycled content, energy efficient; biobased and environmentally preferable products.

- Improve energy efficiency and reduce green house gasses in buildings and transportation by 30%
- Water consumption by 16% by the end of 2015.

Improving Energy Efficiency



DoD- Impacts of CAA



- Maintenance, rework, and inspection of vehicles;
 - Operation of new and existing boilers and incinerators;
 - Waste disposal;
 - Manufacturing;
 - Some training activities;
 - Air emissions monitoring;
 - Decreased use of ozone depleting chemicals (ODCs); and
 - Acquisition of alternatively fueled vehicles.
-
- The Army also assesses their contribution to air pollutants such as ozone or particulate matter and the air quality status of their EPA regions. Army leadership manages the hazardous air pollutants and ODCs, as well as risk management planning. They ensure compliance with permit conditions, maintain air emissions inventories, and conduct on-site inspections and audits.

US ARMY Environmental Command (USAEC)



- Reviewing all CAA rulemakings;
- Preparing Army impact analyses and comments on potential rulemakings;
- Preparing guidance documents, including pollution prevention options;
- Developing tools to assist installations in complying with CAA requirements such as technical compliance guides, compliance placards, air pollution prevention guides and compliance guides for smokes and obscurants;
- Working with the Office of the Director of Environmental Programs and the Installation Management Command to develop compliance strategies;
- Tracking the Army's progress on meeting DoD and Army environmental goals;
- Supporting installations when requested;
- Maintaining contact with the EPA to stay abreast of current and future initiatives;
- Representing the Army on DoD committees, along with ODEP;
- Hosting discussion groups within the Army to exchange lessons learned and share information; and
- Supporting various training opportunities and forums, such as the Real World Clean Air Symposium and the Environmental Training Workshop, to aid installation air program managers.

U.S. Army Environmental Command (USAEC)



- The USAEC is awarding three multiple award task order contracts intended to help lower the cost of installation environmental services. These contracts offer proven contractors, task order competition, performance-based acquisition, and no contract management fees. The three contracts cover installation environmental services for:
 - **Environmental compliance** (awarded July 2010)
 - Cultural resources (awarded July 2010),
 - Natural resources (awarded Sept 28 2010).
- ***The Environmental Compliance contract*** is for purchasing services for regulation of air pollution, drinking water, water pollution, waste management, above-ground and under-ground storage tank management, spill prevention and cleanup, emergency planning and reporting, and pesticide management. Typical products under the contract are surveys, inventories, plans, permit applications, or other studies, program Improvement such as pollution prevention assessments, sampling and analysis, training and outreach, and compliance and management system reviews.

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Value Proposition



- ITECS is the **partnership development company** that **aligns our clients business strategy with** federal and state governments to
 - open up new sales channels
 - fund research projects
 - accelerate innovation

Case Study: Coating Company



- Challenge - \$5B Coating Company wants to:
 - Leverage government funding for blast mitigation
 - Find technology/funds to start a new “healthy room” product line
 - Explore government procurement for blast mitigation
 - Help with managing the government grants

Case Study: Coating Company



- Results
 - Created partnership: agency, nonprofit, university, healthcare clinic to develop new “healthy room” platform
 - Created partnerships: agency, Tier 1, end users to create blast mitigation product
 - Obtained funding for both projects - \$7.5MM
 - Considered for several procurement opportunities in Israel with blast mitigation
 - ITECS is subcontracted to help manage government grants

Process for Obtaining Funds



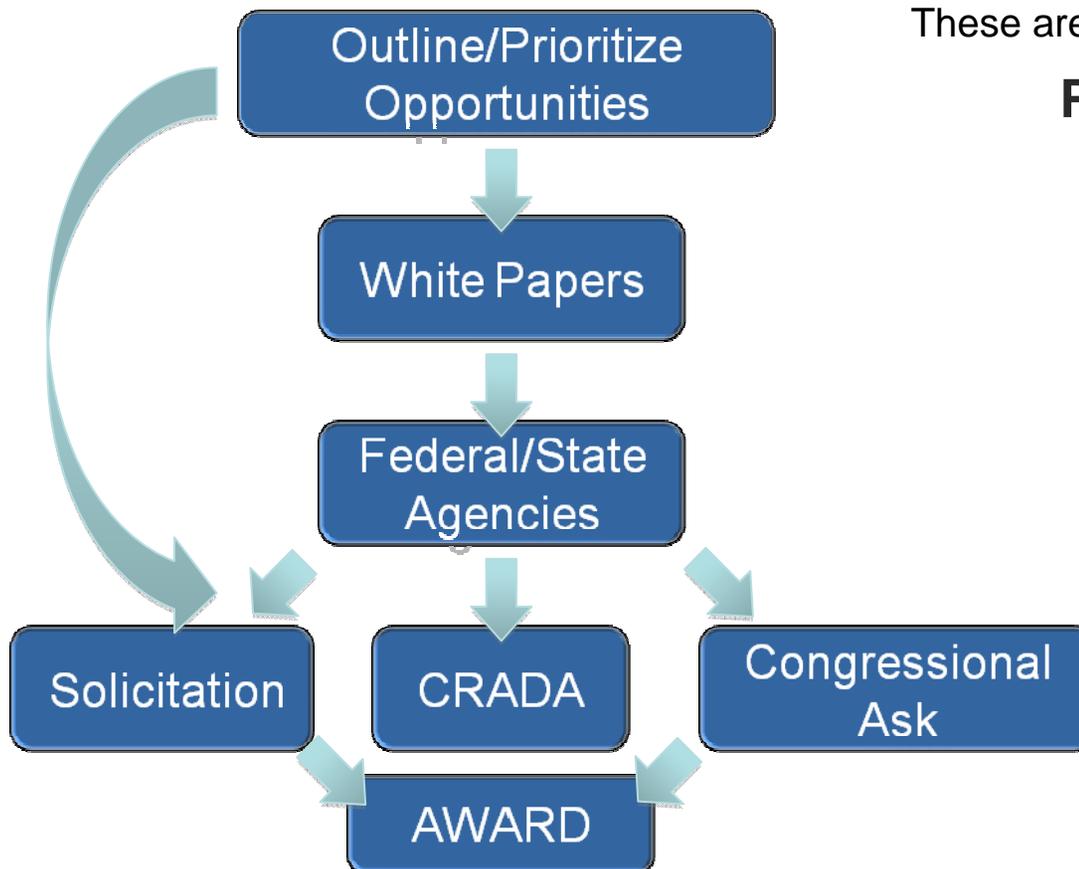
Reactive Approach

Responding to an open solicitation (RFP).
These are usually very competitive.

Proactive Approach

We recommend this approach with all of our clients.

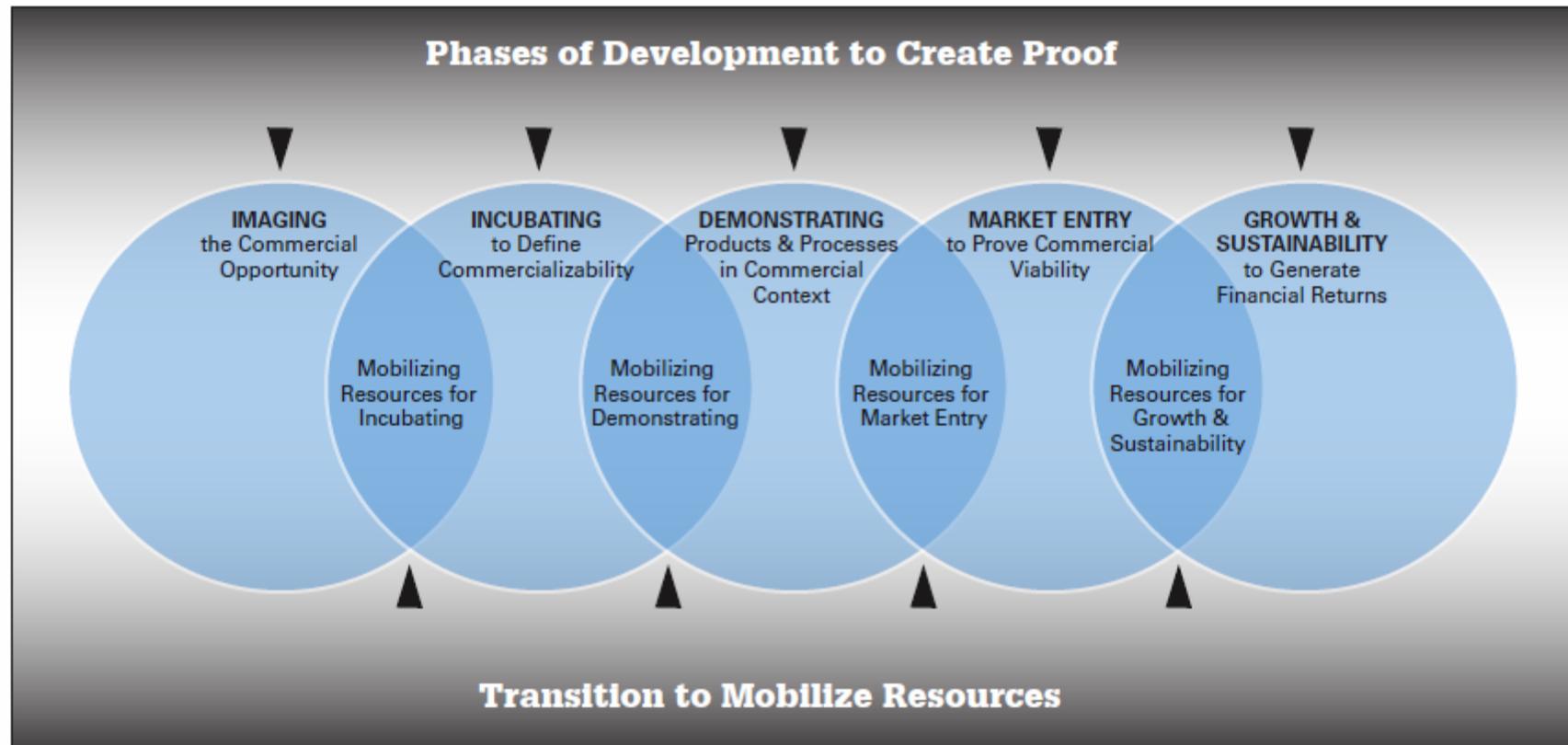
- Align:** align best technology with Agency initiatives and mission. Work with a team that is familiar with vetting projects based on these initiatives
- Position:** proactively position the technology prior to funding opportunity release through whitepapers, presentations, face-to-face meetings
- Execute:** Work internally with knowledge gained at agencies to develop value proposition
- Access:** the proactive approach requires access to agency decision makers



Development Cycle



The Process of Technology Commercialization



ROI



- R&D Funds Received

- 2 New Technologies
Total \$7.5MM

- Costs

- Total \$0.416MM

- Return

- ROI for R&D funding \$1 : \$18.03
- Procurement for one of the technologies in Israel
- Develop a whole new product line for other technology

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Resources



- Website: itecs-innovative.com. Blog: itecsinsider.com
- Mailing list for solicitations and more information: Brendan Ward, Marketing, bward@itecs-innovative.com, 404 210-4140
- UIDP- Anthony Boccanfuso, Exec. Director, 202-334-2302, ABoccanfuso@nas.edu
- IDCC- Alan D. Ayers, President, (860) 633-6772 (office), adayers@buildinnovation.com