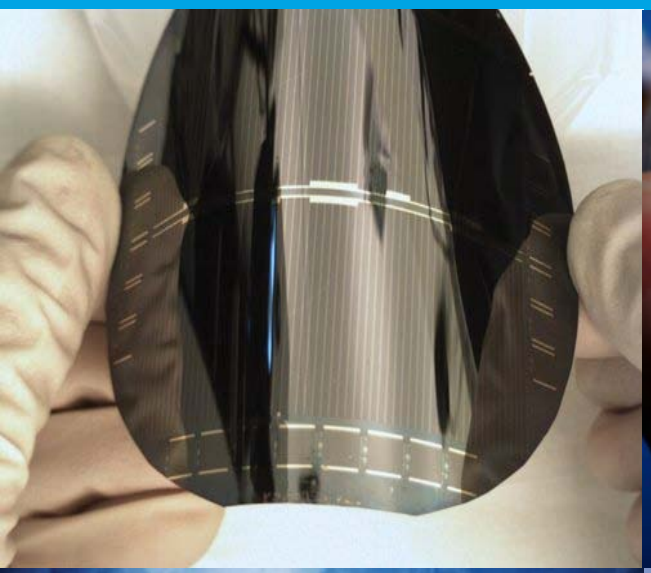
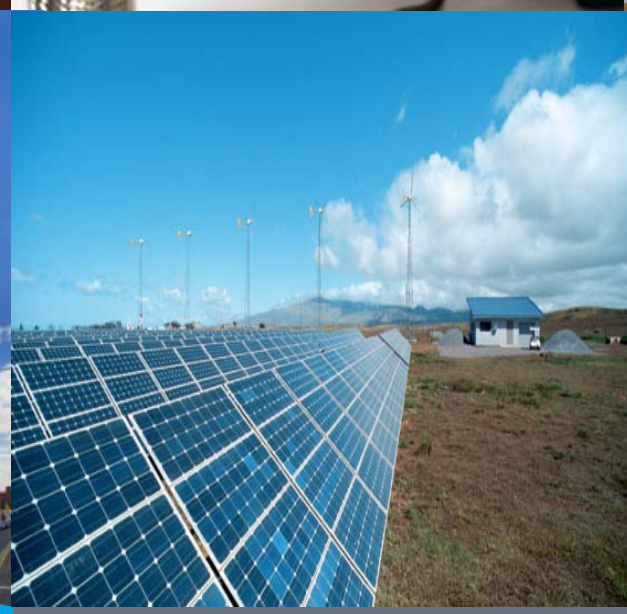
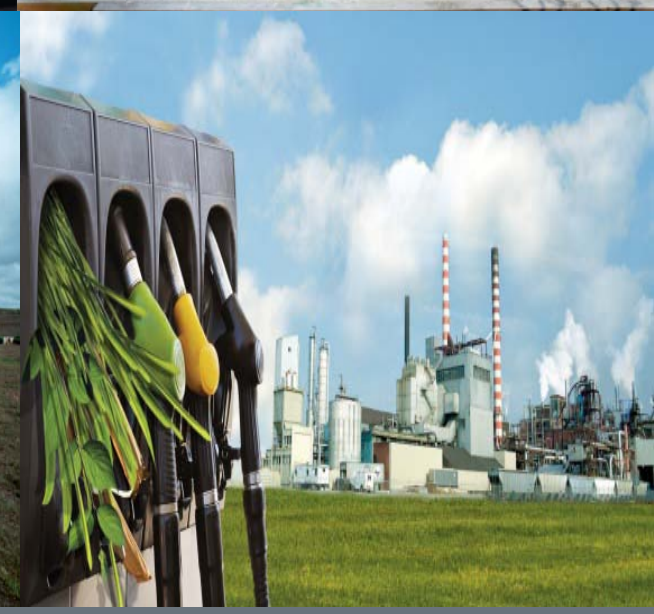
U.S. DEPARTMENT OF ENERGY







EERE International IAC Student Meeting

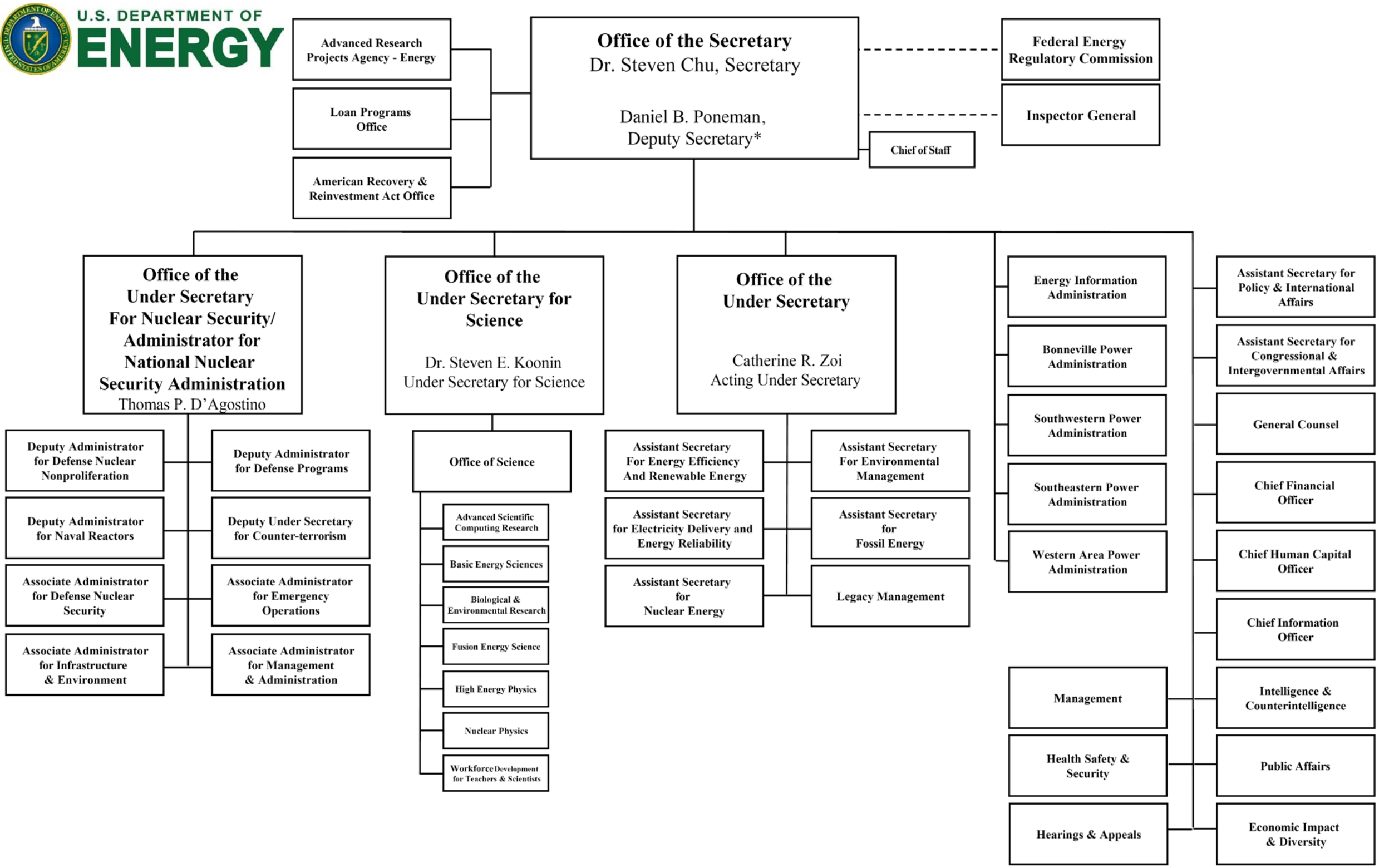
February 3, 2011

Dan Birns
Advisor, International Program
Energy Efficiency & Renewable Energy

AGENDA

- Background/Context
- EERE International Program Goals
- Budget
- Bilateral Activity Overview
- Multilateral Activity Overview
- Resources

DOE Org Chart



DOE Org Chart

U.S. DEPARTMENT OF ENERGY

Office of the Secretary
Dr. Steven Chu, Secretary

Daniel B. Poneman,
Deputy Secretary*

- Advanced Research Projects Agency - Energy
- Loan Programs Office
- American Recovery & Reinvestment Act Office
- Federal Energy Regulatory Commission
- Inspector General
- Chief of Staff

Nukes

- Deputy Administrator for Defense Nuclear Nonproliferation
- Deputy Administrator for Naval Reactors
- Associate Administrator for Defense Nuclear Security
- Associate Administrator for Infrastructure & Environment
- Deputy Administrator for Defense Programs
- Deputy Under Secretary for Counter-terrorism
- Associate Administrator for Emergency Operations
- Associate Administrator for Management & Administration

Basic R&D

Office of Science

- Advanced Scientific Computing Research
- Basic Energy Sciences
- Biological & Environmental Research
- Fusion Energy Science
- High Energy Physics
- Nuclear Physics
- Workforce Development for Teachers & Scientists

Applied RDD&D

- Assistant Secretary For Energy Efficiency And Renewable Energy
- Assistant Secretary for Electricity Delivery and Energy Reliability
- Assistant Secretary for Nuclear Energy
- Assistant Secretary For Environmental Management
- Assistant Secretary for Fossil Energy
- Legacy Management

EERE Org Chart

Assistant Secretary
Cathy Zoi

Principal Deputy
Henry C. Kelly

Chief Operating Officer
Steven G. Chalk

Director, Strategic Programs
Vacant
Director, International Program
Robert Sandoli

Director, Technology Advancement & Outreach
Philip R. West

Office of Technology Development

DAS for Energy Efficiency
Kathleen B. Hogan

DAS for Renewable Energy
Steven G. Chalk, Acting

Building Technologies
Roland J. Risser
Program Manager

Federal Energy Management
Timothy Unruh
Program Manager

Industrial Technologies
Leo Christodoulou
Program Manager

Weatherization & Intergovernmental
LeAnn M. Oliver
Program Manager

Vehicle Technologies
Patrick B. Davis
Program Manager

Sustainability Performance
Jennifer MacDonald
Acting Director

Fuel Cell Technologies
Sunita Satyapal
Program Manager

Geothermal Technologies
JoAnn Milliken
Acting Program Manager

Biomass Program
Paul F. Bryan
Program Manager

Solar Energy Technology
Ramamoorthy Ramesh
Program Manager

Wind & Hydropower Technologies
Jacques Beaudry-Losique
Program Manager

DAS for Business Administration
Scott E. Hine, Acting

Program Execution Support
Melody C. Bell, Director

Planning, Budget & Analysis
A. Avon Meacham, Director

Information & Business Management Systems,
Douglas E. Kaempf, Director

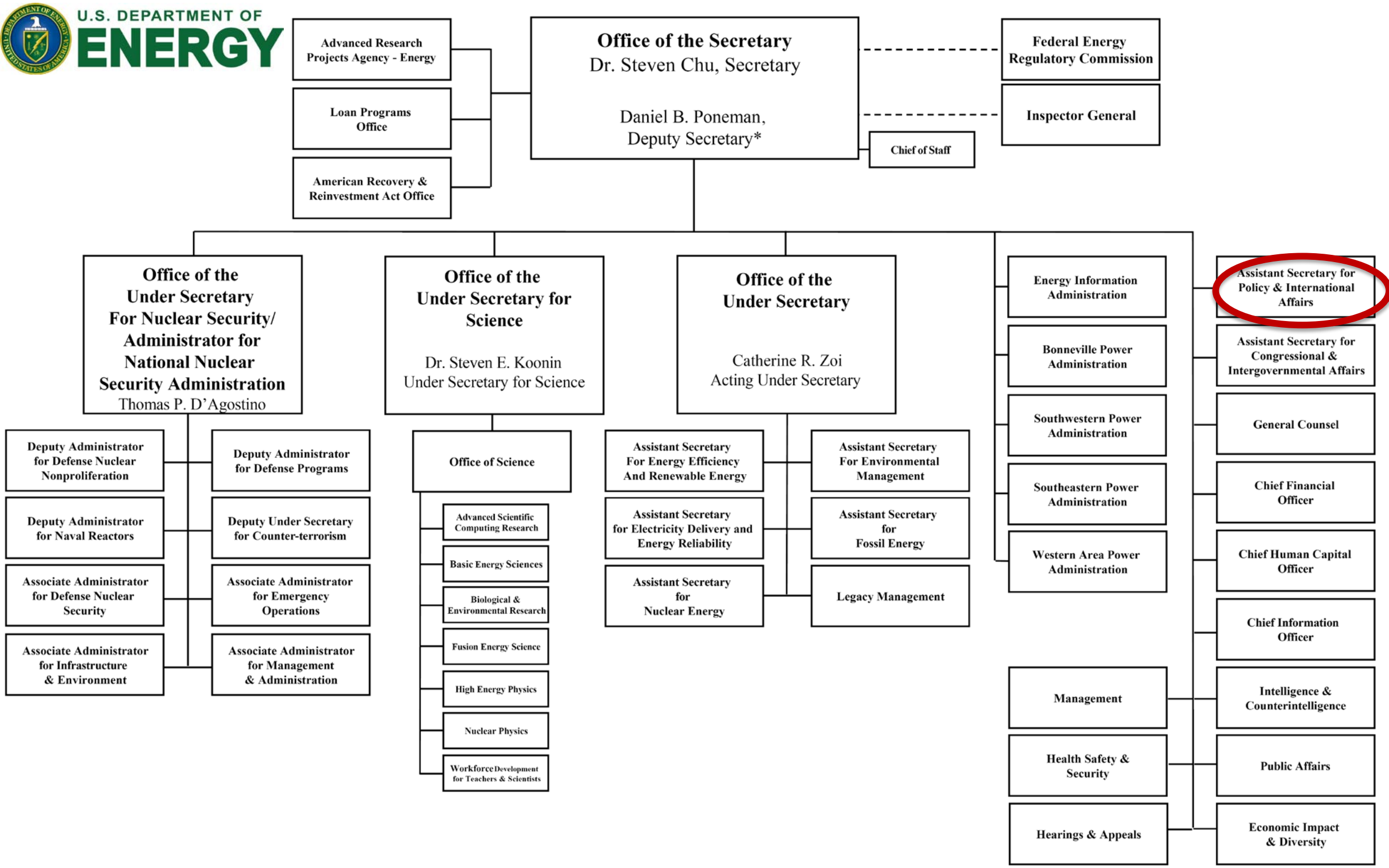
Field Performance Management
Scott E. Hine, Director

Golden Field Office
Carol Battershell, Manager

Business Admin.

Technology Programs

DOE Org Chart



Functions of EERE International Program

- **Coordinate activities across EERE Programs**
  - Develop stronger cross-program activities
  - Enhance program-specific activities
- **Coordinate with DOE's Office of Policy and International Affairs (PI), and other offices within DOE**
  - Serve as primary point of contact with PI
  - Support DOE international priorities
- **Coordinate with other USG agencies**
  - Primarily State Dept, but also EPA, Treasury, Commerce, DOD
- **Represent EERE in meetings/events with representatives of foreign governments, companies, NGOs, etc.**

EERE Draft Strategic Goals

- Strategic Goal 1. Accelerate the research and development of energy efficiency and renewable energy technologies through collaboration with international partners.

- Strategic Goal 2. Accelerate the deployment of energy efficiency and renewable energy technologies to help meet growing demand for energy and to reduce greenhouse gas emissions.

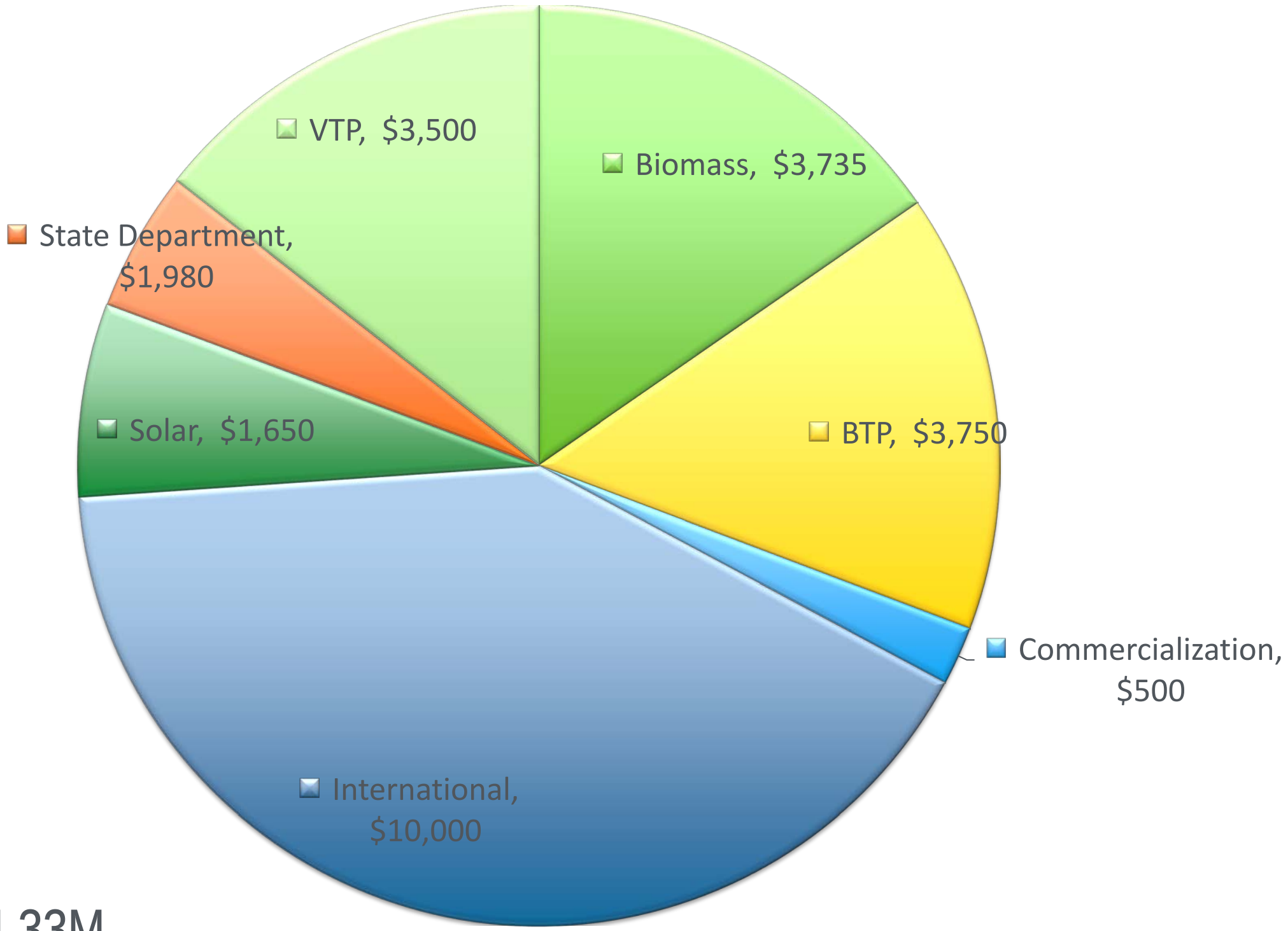
- Strategic Goal 3. Develop global markets for clean energy solutions through policy and technology analysis, technical assistance, and training.

EERE International Funding

- FY2009 Omnibus Appropriations Bill
  - $5M for EERE International
    - $2M for the Energy and Climate Partnership of the Americas*
    - $2M for U.S.-Israel Cooperation*
- FY2010 Energy and Water Development Appropriations
  - $10M for EERE International
    - $2M for U.S.-Israel Cooperation*
- FY2011 Request
  - $25M
    - House Mark: $22M
    - Senate Mark: $17M

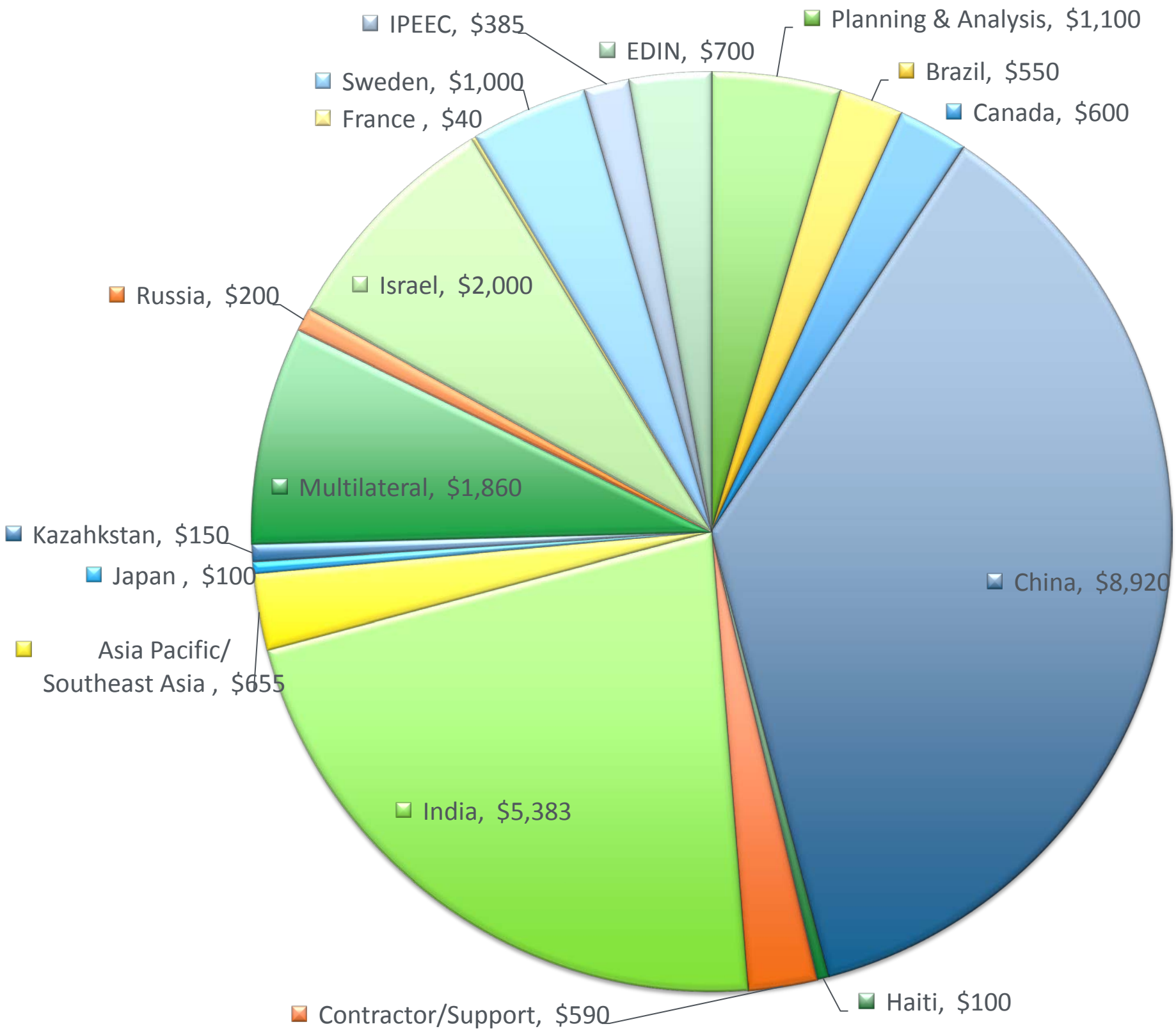
*Congressionally directed

Sources of EERE FY2010 International Funding



Total= $24.33M

EERE International Budget by Country



Selected Bilateral Activities

U.S.-China Cooperation

U.S.-China Strategic and Economic Dialogue (S&ED)

U.S.-China Ten Year Framework (TYF) for Cooperation on Energy & Environment, 06/2008

Action Plans:

- **buildings, appliances & industry**
- **transportation**
- **utilities**

Clean Air, 06/2008

Clean Water, 06/2008

Wetlands Conservation, 06/2008

Protected Areas/Natural Resources

MOU to "Enhance Cooperation on Climate Change, Energy, & the Environment", 07/2009

- **renewable energy**
  - **- Solar**
  - **- Wind**
  - **- Biofuels**
- **cross-cutting R&D**
  - **- Buildings**
  - **- Vehicles**
  - **- Carbon Capture & Sequestration**

Charles Dharapak / AP

November 2009

Additional Agreements in:

- Biofuels Development
- Buildings Energy Efficiency
- Industrial Energy Efficiency
- EcoPartnerships & Sub-national Cooperation

U.S.-China Clean Energy R&D Center

- Announced by Secretary Chu, Chinese Minister of Science Wan Gang, and Administrator of National Energy Administration Zhang Guo Bao in July 2009
- Goal: to facilitate joint research and development on clean energy by teams of scientists and engineers from the U.S. and China, as well as serve as a clearinghouse to help researchers in each country.
- Three initial priority areas:
  - Building energy efficiency
  - Vehicle technologies
  - Carbon capture and sequestration

India

Buildings

Goal: Advance the understanding and development of green buildings; incorporate building-integrated renewable energy, approach or reach zero net energy use

- *Analysis and benchmarking of commercial and residential buildings* -- Testing equipment and building performance, support for Energy Conservation Building Code
- *Energy simulation tools* — Develop tools customized for Indian climate zones; work with high-impact industries (e.g. data centers, hotels) to provide design assistance and energy modeling support
- *Building assessments and design charrettes* for new buildings and retrofits
- *US-India Cities Partnerships* – Establish partnerships between US and Indian cities under the Partnership for Sharing US Best Practices in Clean Urban Development, Energy and Environment
- *Zero energy buildings and communities* – Provide technical assistance on demonstrating ZEBs and ZECs

Industrial

Goal: Improve energy efficiency of Indian industry

- *Promote Save Energy Now* – Develop outreach materials; conduct workshops and demonstrations

Geothermal

Goal: Advance the deployment of GSHPs in India

- *Conduct training on GSHPs and introduce U.S. technologies with Commerce FCS*

India (cont.)

Biofuels – MOU with MNRE

Goal: Conduct joint R&D with Indian government and local partners on second generation cellulosic ethanol and biodiesel; provide technical assistance to development of pilot plants

- *Cellulosic ethanol pilot plant* – Design layout, capacity, feedstock flexibility, process integration considerations, supporting infrastructure
- *LCA of jatropha biodiesel for road transportation* – Evaluate environmental impact and identify opportunities to reduce impact
- *Algae resource assessment* – Evaluate climate conditions, nutrient availability, water resources, land characteristics, infrastructure, labor availability

Solar – MOU with MNRE

Goal: Advance the deployment of solar technologies in India

- *Extend solar resource assessment to all of India* – Validate satellite data with ground data
- *Identify optimal sites* – In terms of technical and economic potential, including rural villages
- *Promote Solar Cities partnerships* – between US and Indian cities

Wind – MOU with MNRE

Goal: Advance the deployment of wind technologies in India

- *Low-wind turbine technology and materials* – share DOE/NREL experience, including standards and certification

Biofuels

Goal: Advance the next generation of biofuels technologies and better understand the impact of expanded biofuels economies on sustainability issues

- *Sustainability* – Evaluate impacts of expanded biofuels production and use on land, water use and availability and biodiversity; life cycle impacts of integrated biorefinery
- *GHG and air quality impacts* – of ethanol consumption scenarios using the GREET model
- *NREL-CENPES MOU* – R&D on next-generation biofuels

Energy Working Group

Goal: Develop an agenda for mutually beneficial energy cooperation

- Initial Action Plan focuses on industrial efficiency, renewable energy cost and performance analysis, and hydropower.
- Working group meeting to be held this fall to crystallize agenda

Israel

Goal: Conduct joint R&D on cutting-edge clean energy technologies, successfully commercialize technologies

- *Competitive Solicitation through BIRD* – Binational Industrial Research and Development Foundation (BIRD) will conduct a competitive solicitation, with private cost-share, for cooperative research, development, deployment, and demonstration projects. Projects selected at the working group meeting on 11/5/2009 include: solar micro-turbine, Smart Grid, building-integrated photovoltaics, and biocatalysts for biodiesel production.
- *Algal Biomass* – LCA of algal biomass; develop novel extraction methods; analyze cost-effectiveness of fossil power plant carbon recycling through open ponds; analyze production processes; and assess cost-effectiveness of using algae as a gasification and/or pyrolysis feedstock; with Seambiotic

Work conducted under Implementation Arrangement #4 to the DOE/MNI agreement

Canada

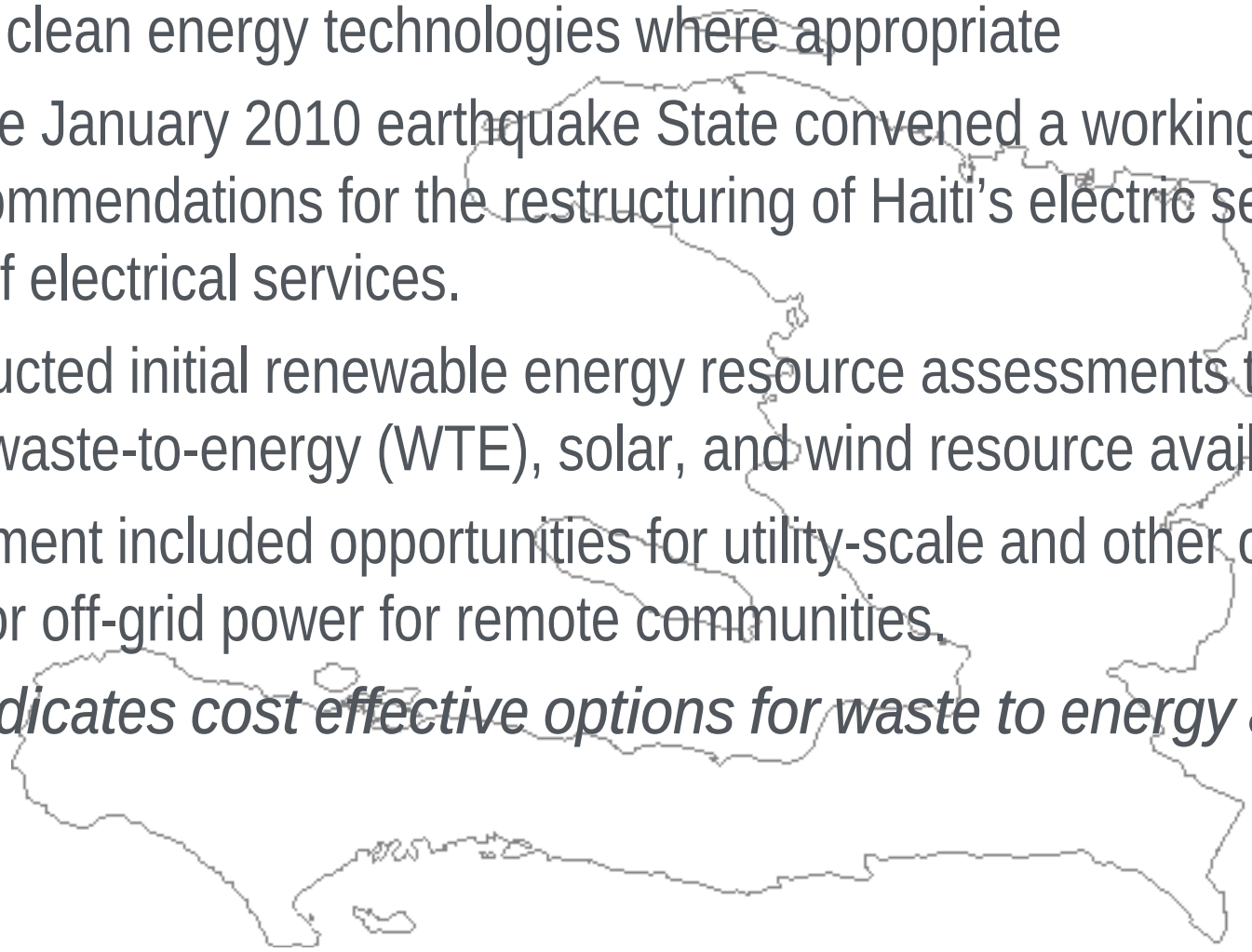
The U.S. Canada Clean Energy Dialogue established during President Obama's visit to Ottawa on February 19, 2009 involves cooperation on the following technology areas:

- CCS
- Smart Grid
- Clean Energy Research and Development
  - Develop a Clean Energy RD&D Collaboration Framework and a technology "roadmap" to identify and describe the technology and associated R&D pathways that would allow Canada and the United States to meet joint2050 GHG reduction goals
  - Promote increased levels of collaborative research, development, and demonstration among laboratories, industry and academia
  - Help create a single North American market for clean energy technologies, achieved where possible through compatible codes, standards and incentives

Haiti

Goal: Support the State-led energy sector planning process and promote the incorporation of clean energy technologies where appropriate

- Following the January 2010 earthquake State convened a working group to provide recommendations for the restructuring of Haiti's electric sector and the expansion of electrical services.
- NREL conducted initial renewable energy resource assessments to determine current the waste-to-energy (WTE), solar, and wind resource available in Haiti
- The assessment included opportunities for utility-scale and other on-grid options, and micro- or off-grid power for remote communities.
- *Analysis indicates cost effective options for waste to energy and wind*



Selected Multilateral Activities

Energy & Climate Partnership of the Americas (ECPA)

Goal: To increase cooperation within the Western Hemisphere on energy and climate issues to enhance U.S. energy security, reduce global greenhouse gas emissions, and build stronger relationships with our neighbors through:

- Public Policy
- Capacity Building
- Developing the Clean Energy Private Sector

- Current projects underway:
  - Chile– Renewable Energy Center and CSP project
  - Peru– Energy Efficiency Center
  - Mexico– Wind Energy
  - Caribbean– Low-Carbon Communities in the Caribbean
  - Costa Rica– Energy Efficiency Center
  - Dominica– Small Wind

Energy Development in Island Nations (EDIN)

- EDIN helps islands across the globe adopt energy efficiency measures and deploy renewable energy technologies
- Partnership began officially in August 2008, with Iceland, New Zealand and U.S. (DOE/EERE) as founding members
- EDIN will build upon the HCEI model of transforming an island to a clean energy economy through technical, financial and policy assistance.
- USVI Pilot Project– *60% Clean Energy by 2025*

International Partnership for Energy Efficiency Cooperation (IPEEC)

- High-level forum for discussion, consultation and information exchange
- Launched on May 24, 2009 at the G8 Energy Ministerial in Rome
- 15 member countries representing both developed and developing major economies
- Developed under close collaboration with IEA (IPEEC Secretariat hosted at IEA)
- Initial Work Plan and Lead Countries:
  - [WEACT] Worldwide Energy Efficiency Action through Capacity Building & Training (Italy)
  - [SBN] Sustainable Buildings Network (Germany)
  - [EEFM] Assessment of Energy Efficiency Financing Mechanisms (India)
  - [EMAK] Energy Management Action Network for Industrial Energy Efficiency (Japan)
  - [IPEEI] Improving Policies through Energy Efficiency Indicators (France)
  - [SEAD] Super-efficient Equipment and Appliance Deployment (U.S.)
  - [GSEP] Global Superior Energy Performance (Japan)
- Inaugural high-level Policy Committee meeting held in Washington, DC on May 11, 2010
- Second PoCo meeting held October 25-26, 2010, in Delhi, India
- ExCo meeting this week in Paris

Clean Energy Ministerial: Overview

- In July 2010, Secretary Chu convened ministers and other high-level representatives from 24 governments in Washington, D.C. for the first Clean Energy Ministerial. The goal: To accelerate the transition to clean energy technologies.
- UAE is hosting second meeting on April 6th and 7th and UK is hosting third meeting in 2012.

>70% of Global GDP > 80% of Global GHG Emissions

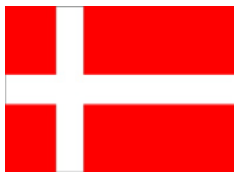

Australia


Belgium

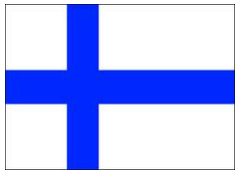

Brazil

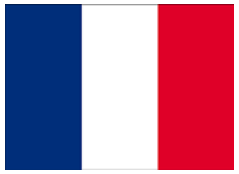

Canada


China


Denmark


European Commission


Finland


France


Germany


India

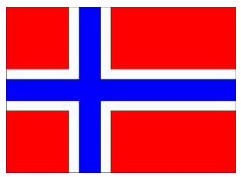

Indonesia


Italy


Japan


Korea

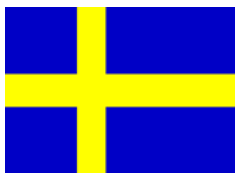

Mexico


Norway

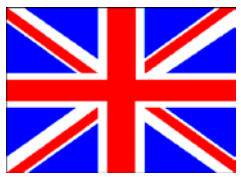

Russia


South Africa


Spain


Sweden


United Arab Emirates


United Kingdom


United States

Core Principles

- "Deliverables" are concrete and transformative clean energy initiatives led by like-minded and willing governments
- No expectation that each government participates in all initiatives
- No communiqué or other negotiated text
- Distributed leadership model
- Meetings are opportunities to assess and publicly communicate progress, as well as guide and strengthen the work of the CEM

Accomplishments

- Eleven initiatives launched, with potential to:
  - Avoid the need to build more than 500 mid-sized power plants in the next 20 years
  - Bring improved energy services to more than 10 million people without access to electricity by 2015
  - Promote rapid deployment of renewable energy, carbon capture and storage, and electric vehicles
  - Help encourage women to pursue careers in clean energy
- Widespread participation and buy-in from governments accounting for more than 80% of global energy consumption and a similar percentage of the market for clean energy technologies

Linkages to other Fora

The CEM complements other international fora, but is the only high-level forum focused exclusively on clean energy technologies

- The CEM provides a concrete means for implementing the Technology Action Plans launched under the MEF Global Partnership

- CEM governments account for over 80% of global GHG emissions, which makes the transition to clean energy in these economies central to the climate agenda

- CEM initiatives benefit from and contribute to the agendas of IRENA, IPEEC, and IEA

Super-efficient Equipment and Appliance Deployment (SEAD)

- SEAD is a *global market transformation initiative* for deploying super-efficient equipment and appliances.

- *Government initiative* that will *engage the private sector* to tap the large global energy savings potential available through *improved appliance and equipment efficiency.*

SEAD Goals

- *Raise the efficiency ceiling*

  Pull super-efficient appliances and equipment into the market through cooperation on measures like incentives, procurement, awards, and R&D investments

- *Raise the efficiency floor*

  Work together to bolster national or regional policies like minimum efficiency standards

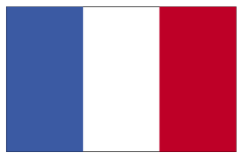
- *Strengthen the foundations of efficiency programs*

  Coordinate technical work to support these activities


Australia


Canada


European Commission


France


Germany


India


Japan


Korea


Mexico


Russia


South Africa


Sweden


United Kingdom


United States

Global Superior Energy Performance (GSEP) Partnership

- **Purpose**: Significantly cut global energy use through improved efficiency practices
  - Spur continuous energy performance improvements in industrial facilities and large buildings
  - Promote public-private partnerships for cooperation in individual energy-intensive sectors

- **Governments participating in GSEP**:
  - Canada, Denmark, the European Commission, France, India, Japan, Korea, Mexico, Russia, South Africa, Sweden, and the United States

Resources

EERE International Program Homepage

- http://www.eere.energy.gov/international

Policy and International Affairs Homepage

- http://pi.energy.gov