

International Technology Cooperation: U.S. View



**Dr. Harlan L. Watson
Senior Climate Negotiator and Special Representative
U.S. Department of State**

**UNFCCC senior-level round-table discussion on
International Technology Cooperation on
Environmentally Sound Technologies: What makes it
work?**

**UNFCCC COP 12
Gigiri, Nairobi, Kenya
November 14, 2006**



U.S. Approach

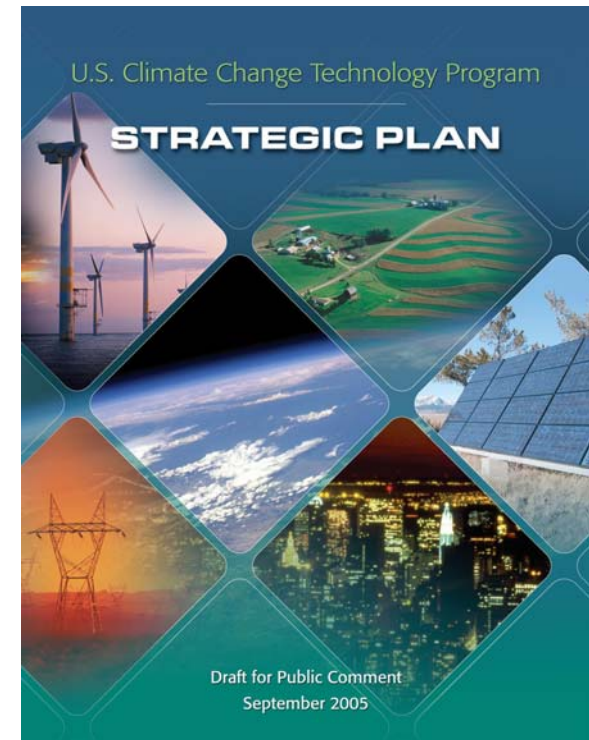
- **Harnesses the power of markets and technological innovation, maintains economic growth, and encourages global participation.**
- **Reaffirms U.S. commitment to goal of UNFCCC.**
- **Places climate change in a broader development context.**
- **Has four basic elements:**
 - Near-term policies and measures, including financial incentives, standards, regulations, and voluntary programs;
 - Improved climate science;
 - Advanced technologies; and
 - International collaboration.
- **Work in partnership with other governments, non-governmental organizations, and the private sector.**



Technology: Seeking Better and More Cost-Effective Solutions



- **Technology = Hardware (equipment, machinery, tools) + Software (skills, knowledge, expertise, know-how, “know-why”).**
- **U.S. Climate Change Technology Program (CCTP): \$14.3 billion 2001-2006; \$3.0 Billion requested for 2007.**
- **Goals:**
 - Reduce emissions from energy end-use and infrastructure;
 - Reduce emissions from energy supply;
 - Capture and sequester CO₂;
 - Reduce emissions of Non-CO₂ greenhouse gases;
 - Improve capabilities to measure and monitor emissions; and
 - Bolster basic science.



www.climatetechnology.gov

Roadmap for Climate Change Technology Development



	NEAR-TERM	MID-TERM	LONG-TERM
GOAL #1 Energy End-Use & Infrastructure	<ul style="list-style-type: none"> Hybrid & Plug-In Hybrid Electric Vehicles Engineered Urban Designs High-Performance Integrated Homes High Efficiency Appliances High Efficiency Boilers & Combustion Systems High-Temperature Superconductivity Demonstrations 	<ul style="list-style-type: none"> Fuel Cell Vehicles and H₂ Fuels Low Emission Aircraft Solid-State Lighting Ultra-Efficient HVACR "Smart" Buildings Transformational Technologies for Energy-Intensive Industries Energy Storage for Load Leveling 	<ul style="list-style-type: none"> Widespread Use of Engineered Urban Designs & Regional Planning Energy Managed Communities Integration of Industrial Heat, Power, Process, and Techniques Superconducting Transmission and Equipment
GOAL #2 Energy Supply	<ul style="list-style-type: none"> IGCC Commercialization Stationary H₂ Fuel Cells Cost-Competitive Solar PV Demonstrations of Cellulosic Ethanol Distributed Electric Generation Advanced Fission Reactor and Fuel Cycle Technology 	<ul style="list-style-type: none"> FutureGen Scale-Up H₂ Co-Production from Coal/Biomass Low Wind Speed Turbines Advanced Biorefineries Community-Scale Solar Gen IV Nuclear Plants Fusion Pilot Plant Demonstration 	<ul style="list-style-type: none"> Zero-Emission Fossil Energy H₂ & Electric Economy Widespread Renewable Energy Bio-Inspired Energy & Fuels Widespread Nuclear Power Fusion Power Plants
GOAL #3 Capture, Storage & Sequestration	<ul style="list-style-type: none"> GSLF & CSRP Post Combustion Capture Oxy-Fuel Combustion Enhanced Hydrocarbon Recovery Geologic Reservoir Characterization Soils Conservation Dilution of Direct Injected CO₂ 	<ul style="list-style-type: none"> Geologic Storage Proven Safe CO₂ Transport Infrastructure Soils Uptake & Land Use Ocean CO₂ Biological Impacts Addressed 	<ul style="list-style-type: none"> Track Record of Successful CO₂ Storage Experience Large-Scale Sequestration Carbon & CO₂ Based Products & Materials Safe Long-Term Ocean Storage
GOAL #4 Other Gases	<ul style="list-style-type: none"> Methane to Markets Precision Agriculture Advanced Refrigeration Technologies PM Control Technologies for Vehicles 	<ul style="list-style-type: none"> Advanced Landfill Gas Utilization Soil Microbial Processes Substitutes for SF₆ Catalysts That Reduce N₂O to Elemental Nitrogen in Diesel Engines 	<ul style="list-style-type: none"> Integrated Waste Management System with Automated Sorting, Processing & Recycle Zero-Emission Agriculture Solid-State Refrigeration/AC Systems
GOAL #5 Measure & Monitor	<ul style="list-style-type: none"> Low-Cost Sensors and Communications 	<ul style="list-style-type: none"> Large Scale, Secure Data Storage System Direct Measurement to Replace Proxies and Estimators 	<ul style="list-style-type: none"> Fully Operational Integrated MM Systems Architecture (Sensors, Indicators, Data Visualization and Storage, Models)

U.S.-Initiated International Technology Partnerships



Asia-Pacific Partnership on Clean Development & Climate



AUSTRALIA CHINA INDIA JAPAN KOREA UNITED STATES

- **Asia-Pacific Partnership on Clean Development and Climate (APP)** — 6 members (Australia, China, India, Japan, Republic of Korea, and U.S.): Committed to develop and accelerate deployment of cleaner, more efficient energy technologies to meet national pollution reduction, energy security, and climate change concerns in ways that reduce poverty and promote economic development.
- **Carbon Sequestration Leadership Forum (CSLF)** — 22 members: Focused on CO₂ capture & storage technologies.
- **Generation IV International Forum (GIF)** — 11 members: Devoted to R&D of next generation of nuclear systems.
- **Global Nuclear Energy Partnership (GNEP)** — Seeks to develop worldwide consensus on enabling expanded use of economical, carbon-free nuclear energy to meet growing electricity demand, using a nuclear fuel cycle that enhances energy security, while promoting non-proliferation.
- **Group on Earth Observations** — 66 member countries, the European Commission, and more than 40 participating organizations: Design and implementation of a new Global Earth Observation System of Systems (GEOS).
- **International Partnership for the Hydrogen Economy (IPHE)** — 17 members: Organizes, coordinates, and leverages hydrogen RD&D programs.
- **Methane to Markets Partnership** — 18 members: Recovery and use of methane from landfills, mines, agriculture, and natural gas production systems.



Global Nuclear Energy Partnership (GNEP)

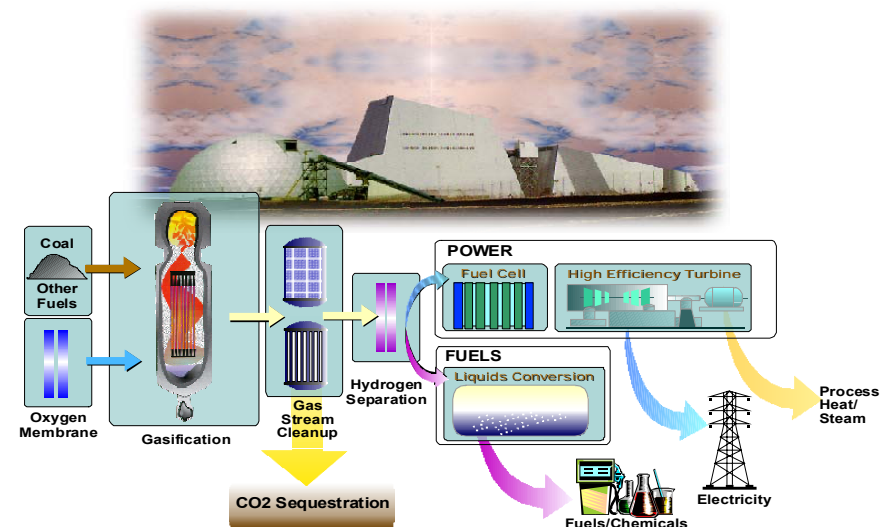




FutureGen



- A U.S.-led, 10-year, approximately \$1 billion international public-private partnership to pioneer coal-to-hydrogen and carbon management technologies for coal.
- FutureGen will be the world's first zero-emission power plant and an international test facility that:
 - Pioneers advanced hydrogen production from coal;
 - Emits virtually no air pollutants; and
 - Captures and permanently sequesters carbon dioxide.
- U.S. Department of Energy (DOE) requesting \$54 million for 2007.
- DOE to share project costs with the private sector FutureGen Alliance (11 large coal and power producers from Australia, China, UK, and U.S.), which has pledged \$250 million.
- India and South Korea have joined partnership, each pledging \$10 million.





USAID
FROM THE AMERICAN PEOPLE



Methane to Markets Partnership



- **Multiple benefits:**

- Promotion of energy security;
- Improved environmental quality/human health;
- Enhanced local economic development; and
- Reduced greenhouse gas emissions

- **By 2015, estimates that Partnership could be delivering annual reductions in methane emissions of up to 180 million metric tons of carbon dioxide equivalent (MMTCO₂E) approximately equal to:**

- Recovering 500 billion cubic feet of natural gas, or
- Annual emissions from 33 million cars or 50 500-megawatt (MW) coal-fired power plants.

- **Launched November 2004 with the goal of reducing emissions of methane, a potent greenhouse gas, by advancing development of projects that recover and use methane as a clean energy source.**
- **Voluntary partnership of 18 countries and more than 350 private entity, financial institution, and NGO project network members working together to advance recovery and use of methane from landfills, mines, and oil & gas and animal waste management systems.**

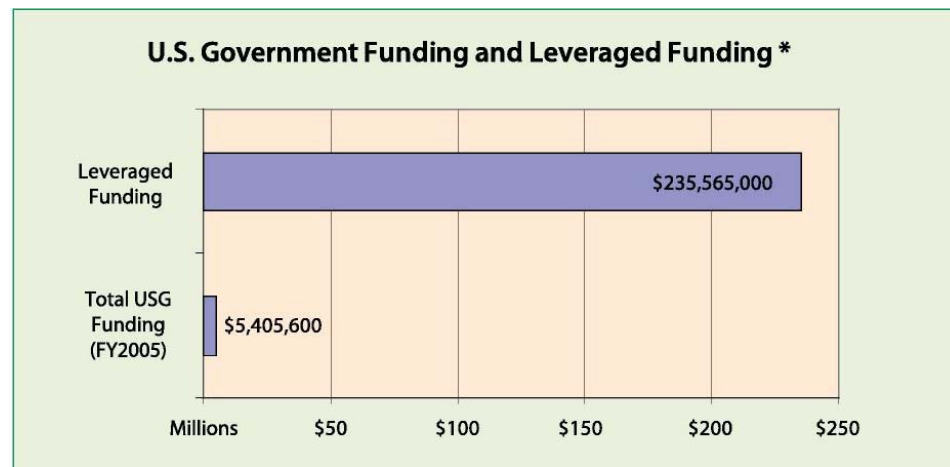
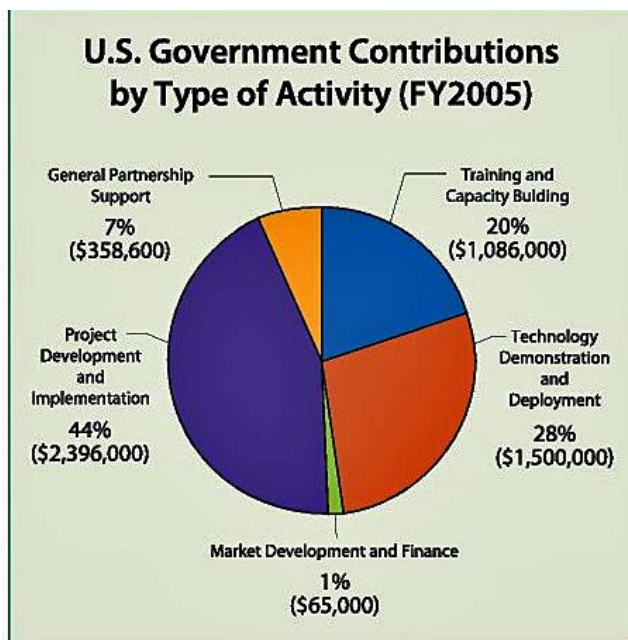


USAID
FROM THE AMERICAN PEOPLE



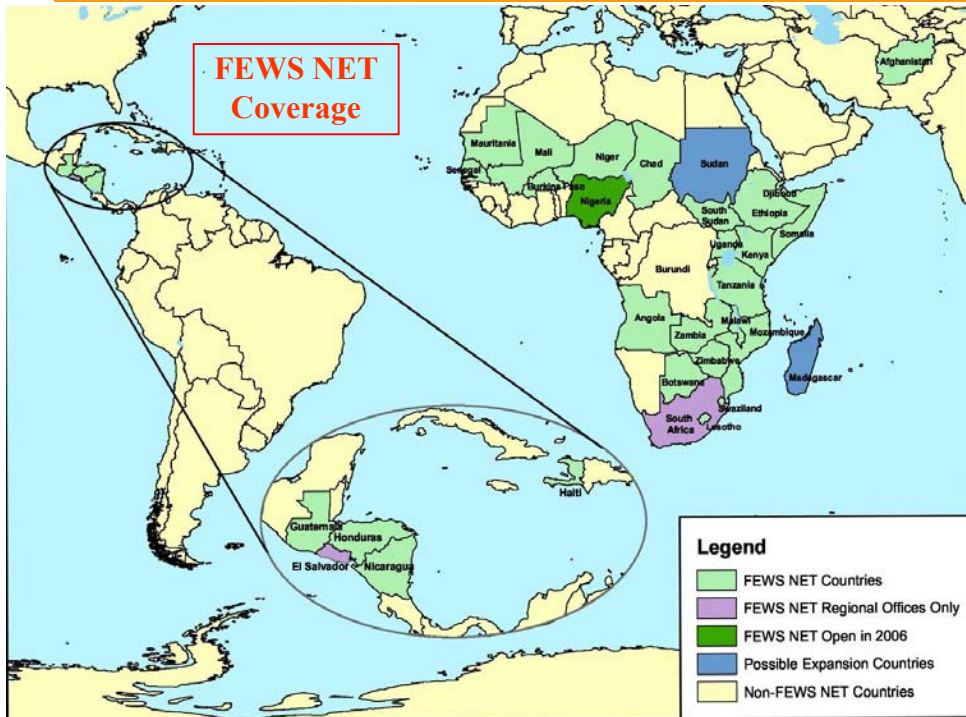
Methane to Markets Partnership: 2005

- **U.S. has pledged up to \$53 million over 5 years; \$5.4 million in 2005 to implement a range of activities:**
 - Export of the successful U.S. voluntary programs;
 - Training and capacity building;
 - Market development;
 - Feasibility assessments; and
 - Technology demonstrations
- **U.S. funding has helped leverage more than \$235 million investment in methane projects around the world.**
- **Future implementation of full-scale projects estimated to result in annual emission reductions of approximately 5 MMTCO₂E.**



* Leveraged funds include financial support provided for activities by non-U.S. government entities, including other national governments or Project Network members. They also include project investment through loans or other financing instruments.

Famine Early Warning System (FEWS-NET)



- **USAID-funded activity that collaborates with international, national, and regional partners (including some 20 African countries) to provide timely and rigorous early warning and vulnerability information on emerging or evolving food security issues.**
- **Remotely sensed data and ground-based meteorological, crop and rangeland conditions are analyzed to project potential threats to food security.**
- **Also focuses its efforts on strengthening African early warning and response networks through capacity development, network building and strengthening, developing policy useful information, and forming consensus about food security problems and solutions.**



Summary

- **U.S. approach to technology development is to work in partnership with other governments, non-governmental organizations, and the private sector in order to:**
 - Leverage resources (financial and intellectual);
 - Speed development through partitioning of RD&D activities addressing large-scale and multi-faceted complex problems; and
 - Share results and knowledge created.
- **Focus on making technologies cost-competitive to speed their development, diffusion, deployment and transfer.**
- **Intellectual property rights (IPR) issues resolved on a case-by-case basis: no magic formula.**
- **Technology is not only hardware (equipment, machinery, tools), but also software (skill, knowledge, expertise, know-how, “know-why”).**