

Technology

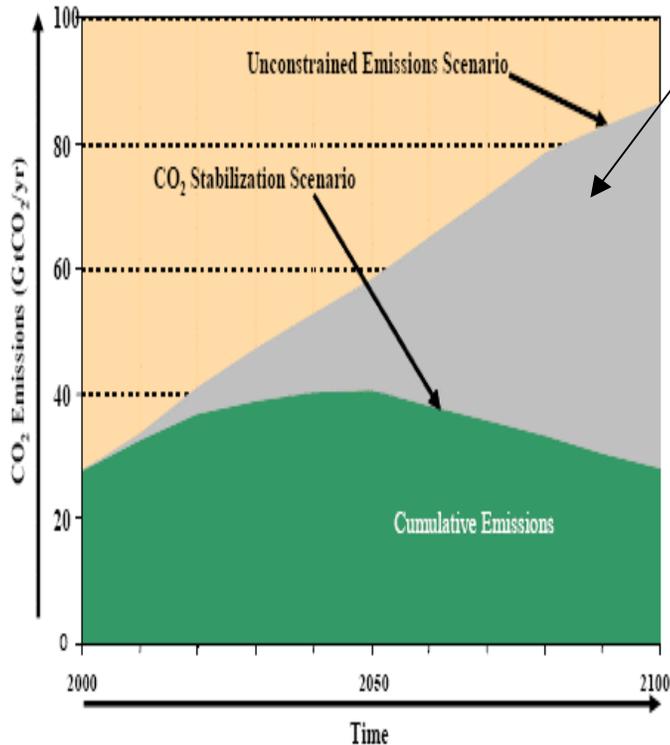
**Presentation by the
United States of America**

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Cooperative Action under the Convention**

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Technology: Key to Addressing the Scope of the Stabilization Challenge

Models project 360 to 4,300 gigatons of cumulative global CO₂ emissions reductions required to meet atmospheric concentration goals ranging from 750 ppm to 450 ppm.



Source: Clarke, L. et al. 2006. *Climate Change Mitigation: An Analysis of Advanced Technology Scenarios*. Richland, WA: Pacific Northwest National Laboratory.

How Big is One Gigaton of CO₂?

| Technology | Actions that Provide One Gigaton CO ₂ /Year of Mitigation or Offsets |
|---------------------------------------|---|
| Coal-Fired Power Plants | Build 273 "zero-emission" 500 MW coal-fired power plants* <i>Equivalent to about 7% of estimated current global installed coal-fired generating capacity of 2 million MW</i> |
| Geologic Sequestration | Install 1,000 sequestration sites like Norway's Sleipner project (1 MtCO ₂ /year) <i>Only 3 sequestration projects of this scale exist today</i> |
| Nuclear | Build 136 new nuclear power plants of 1 GW each instead of new coal-fired power plants without CCS <i>Equivalent to about one third of existing worldwide nuclear capacity of 375 GW</i> |
| Efficiency | Deploy 273 million new cars at 40 miles per gallon (mpg) instead of 20 mpg - or at 17 km/L instead of 8.5 km/L |
| Wind Energy | Install about 270,000 1 MW wind turbines (operating at a capacity factor of 45%), roughly 3 times the global total installed wind capacity at the end of 2007. |
| Solar Photovoltaics | Install about 750 GW of solar PV, which is 125 times current global installed capacity of 6 GW* |
| Biofuels | Using existing production technologies, convert a barren area about 2 times the size of the UK (for a total of over 480,000 km ²) |
| CO ₂ Storage in New Forest | Convert a barren area greater than the size of Germany and France together (for a total of over 900,000 km ²) |

Gigatons = 10⁹ Metric tons (1000 Kilograms)

*Instead of coal-fired power plants

Source: Climate Change Technology Program Strategic Plan, September 2006.

A Different World Since the Convention Negotiations Began in February 1991

- **Significant increase in economic and emissions growth in many regions.**

According to IEA data¹, from 1990 through 2005:

- *World GDP increased 65%*
- *Annex I GDP increased 37%*
- *Non-Annex I GDP increased 124%*
- *World GHG Emissions increased 25%*
- *Annex I GHG Emissions decreased 1%*
- *Non-Annex I GHG emissions increased 57%*

- **Reflective of this increased economic growth has been an impressive change in the availability of capital in most regions of the world.**

➤ *According to IMF² data, the total 1990 current account balances for Non-Annex I Parties was less than \$5.7 billion and rose to \$490 billion in 2005. World Bank data³ show that FDI net inflows for Non-Annex I Parties totaled \$32.8 billion, and rose to \$307.6 billion in 2005.*

- **Private sector role increasing as noted in last year's UNFCCC paper on financial flows** “as they constitute the largest share of investment and financial flows (86 percent)... (ODA) funds are currently less than 1 per cent of investment globally...”

1. *IEA Online Energy Services at <http://data.iea.org/ieastore/statslisting.asp> (Accessed June 2, 2008).*
2. *International Monetary Fund (IMF) World Economic Outlook Database, April 2008 Edition, at <http://www.imf.org/external/pubs/ft/weo/2008/01/weodata/index.aspx> (Accessed on June 2, 2008).*
3. *World Bank, World Development Indicators at <http://web.worldbank.org> (Accessed on June 2, 2008).*

Actions That Can Be Taken

UNFCCC

- Enhanced focus on effective enabling environments to attract investment (both endogenous and exogenous) for technology development and transfer.
- Fuller recognition of contribution of Research, Development & Demonstration (RD&D) to mitigation efforts, including its important role in cost-reduction, which leads to more rapid and broader diffusion.
- Encourage international cooperation in technology RD&D and Diffusion, including partnerships among developed and developing countries.
- Targeted capacity building and associated technical assistance could be provided on an as-needed basis by developed country Parties and international organizations to help position developing countries to better adopt, operate, maintain and diffuse ESTs.

Countries

- Strengthen legal and economic institutions.
- Promote the protection and enforcement of intellectual property rights.
- Promote competitive and open markets for ESTs.
- Provide a well-defined, efficient, and transparent system of contract enforcement.

Enhancing Enabling Environments Removes Barriers

- ***Institutional:*** Lack of legal and regulatory frameworks, limited institutional capacity, excessive bureaucratic procedures.
- ***Political:*** Instability, interventions in domestic markets, corruption, lack of civil society.
- ***Technological:*** Lack of infrastructure, technical standards and institutions for supporting the standards, technical capabilities of firms, and a technology knowledge base.
- ***Economic:*** Instability, inflation, poor macroeconomic conditions, non-transparent markets.
- ***Information:*** Lack of technical and financial information and of a demonstrated track record for many technologies.
- ***Financial:*** Lack of investment capital and financing instruments.
- ***Cultural:*** Consumer preferences and social biases.
- ***Trade:*** Tariff and non-tariff barriers.
- ***Other:*** Lack of Intellectual property protection, and unclear arbitration procedures.

Improve Access to Financing

- There has been a growing emergence of multilateral and bilateral activities both inside—and particularly outside—the Convention that are contributing directly to technology transfer by expanding sources of support to finance ESTs in developing countries.
- CTI's Private Financing Advisory Network is one example of an activity that focuses on matching developing country financing needs with private and public sources—thereby accelerating the implementation of countries' technology priorities.

Bottom Line: Changing Dynamic Dictates Changing Approach

- **Given this changing dynamic of economic and emissions growth, we need to move away from a donor-based paradigm of access and transfer of ESTs toward a more self-sustaining process where developing country enabling environments and private capital markets play an increasing role.**