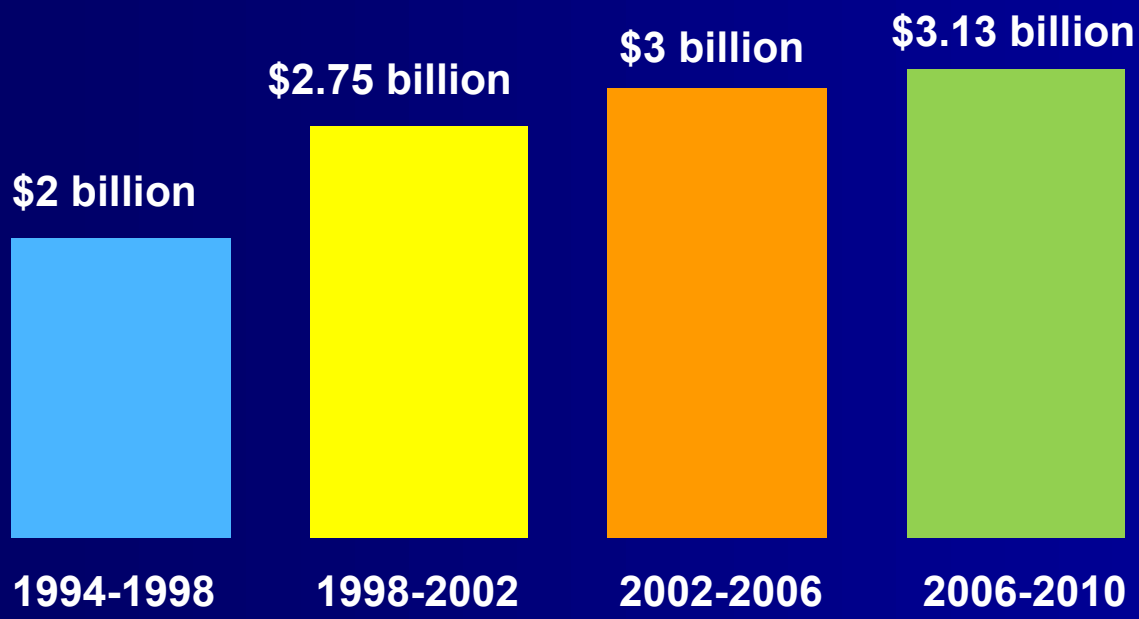
Financing Hydrogen Fuel-Cell Bus Technologies: The GEF Strategy and Experience

Sao Paulo, Brazil
July 1-2, 2009

Global Environment Facility

- **Financial mechanism of**
  - UN Framework Convention on Climate Change
  - Convention on Biological Diversity
  - Stockholm Convention on Persistent Organic Pollutants
  - UN Convention to Combat Desertification
- **Six focal areas**
  - climate change, biodiversity, land degradation, international waters, ozone depletion, and persistent organic pollutants
- **10 GEF agencies**
  - UNDP, UNEP, WB, Regional Development Banks, FAO, IFAD, UNIDO
- **178 member countries**
- **Largest funder for global environment**
  - Since 1991, the GEF has allocated $8b in grants to more than 2,000 projects in 165 countries and have leveraged more than $30b in co-financing.

GEF Replenishments



Leader in Financing Clean Energy and Tech Transfer

- **Invested in $2.5b in more than 130 countries**
  - Mitigation
  - Adaptation
  - Technology needs assessments
  - National communications to the UNFCCC
- **Largest public-sector tech transfer mechanism**
  - Financed demonstration, deployment, diffusion, and transfer of more than 30 environmentally sound technologies

Role of the GEF in Financing Clean Technologies

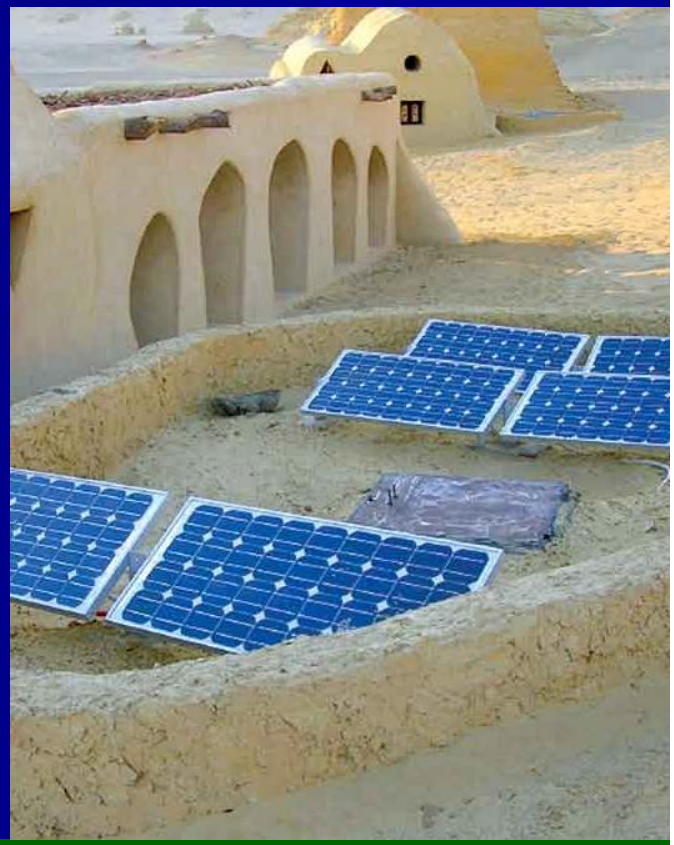
- **Catalytic**
  - Leveraged more than $15b in co-financing
- **Innovative**
  - Leader in financing new, emerging technologies and practices (e.g., concentrating solar power, solar PV, geothermal, fuel-cell buses, bus rapid transit systems)
  - Pioneer in supporting market-based approaches (e.g., ESCOs) and innovative financial instruments
- **Transformational**
  - Supported the development and implementation of energy efficiency appliances standards, buildings codes, renewable energy laws and regulations in dozens of developing countries and economies in transition
- **Cost-effective**
  - More than 1 billion tons of CO_2 expected to be avoided directly and indirectly from GEF projects

Evolution of GEF Climate Change Strategy

- Pilot phase (1991-94)
  - Demonstration of a wide range of mitigation technologies
- GEF-1 to GEF-3 (1994-06)
  - Short-term response measures (mostly related to methane reduction)
  - Long-term operational programs
    - Energy efficiency (OP5)
    - Renewable energy (OP6)
    - Low GHG-emitting energy technologies (pre-commercial) (OP7)
    - Sustainable urban transport (OP11)
- GEF-4 (2006-10)
  - Energy efficiency in residential and commercial buildings
  - Energy efficiency in the industrial sector
  - Market approaches to renewable energy
  - Sustainable energy production from biomass
  - Innovative systems for sustainable urban transport
  - Land use, land-use change, and forestry
  - *Poznan Strategic Program on Technology Transfer*

Poznan Strategic Program on Technology Transfer

- Support for technology needs assessments
- Support for technology transfer pilot projects
- Dissemination of successfully demonstrated technologies and know-how



GEF's Support in Sustainable Urban Transport

- More than $200m GEF grant and $2.5 billion in co-financing
- 37 projects covering more than 70 cities
  - Asia: 12
  - Latin America: 11
  - Africa: 7
  - Eastern Europe: 4
  - Global: 3
- Measures supported
  - Technology demonstration: FCBs
  - Sustainable urban transport systems: bus-rapid transit, dedicated bus lanes, non-motorized transport, urban and transport planning, traffic demand management, etc.

GEF-UNDP FCB Program

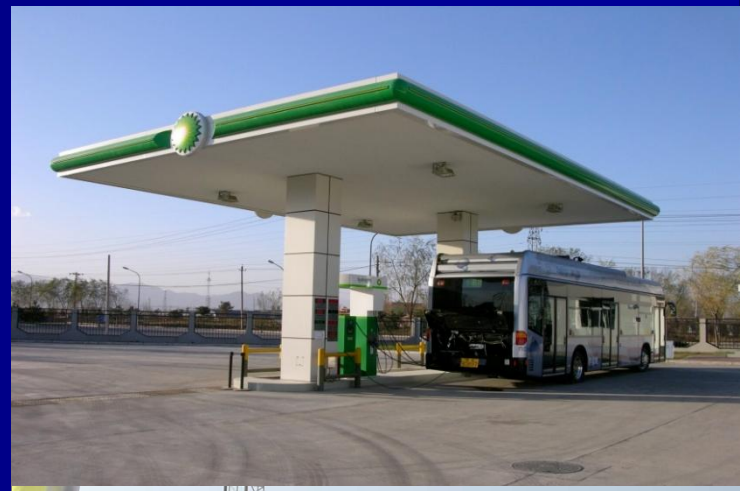
- Objectives
  - Reduce GHG emissions from the transport sector in developing countries
  - Catalyze commercialization of FCB technology in developing countries through "technological leapfrogging"
- Original targets
  - Six cities: Beijing, Cairo, Mexico City, New Delhi, Sao Paulo, and Shanghai
  - GEF funding: $60m
- Strategy
  - Partnership between GEF, UNDP, industry, governments, etc.
  - Phased approach: (1) preparation, (2) demonstration, and (3) commercialization

Status of the FCB Program

- Beijing
  - 3 Citaro FCBs supplied by DaimlerChrysler handed over in Nov 2005
  - Started formal operation in June 2006 on a 18.2 km route with 11 stops
  - Ended operation in October 2007
  - 3 Chinese-made FCBs continued operation and showcased during the Beijing Olympics
- Shanghai
  - Request for proposals issued in Aug 2008
  - Bid evaluated in Oct 2008
  - Shanghai Automotive Industry Corporation won
  - 6 hybrid-powered FCBs to be delivered and showcased at the 2010 World Expo
- Sao Paulo
  - Prototype FCB launched on July 1, 2009

Way Forward for the GEF: To Be or Not to Be?

- According to UNDP's report to the GEF (2006),
  - "… the GEF must make an informed decision [regarding further financing for FCB commercialization] between the years of 2005 and 2007 (or more likely in the next 3 to 8 years."
- Factors to be considered
  - Role of the GEF
  - Outcome of the demonstrations
  - Willingness of donors
- New mandate and GEF-5 Strategy
  - Technology transfer
  - Promoting long-term, advanced low-carbon technologies
- Time to make an informed decision?



Proposed Climate Change Strategy for GEF-5

- Promote the demonstration, deployment, and transfer of advanced low-carbon technologies
- Promote market transformation for energy efficiency in industry and the building sector
- Promote investment in renewable energy technologies
- Promote energy efficient, low-carbon transport and urban systems
- Conserve and enhance carbon stocks through sustainable management of LULUCF
- Continue to support enabling activities and capacity building

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