



Climate Change, Green Growth, and Sustainable Development

United Nations

Department of Economic and Social Affairs



Overview

- Sustainable Development
 - Historical Evolution
 - Green Growth
- Climate Change, Energy, Development
 - Energy Access
 - Two strategies
 - Mainstreaming

Sustainable Development Evolution

- I: Sustainability (1962-92)
 - Challenge: Pollution, Population, Limits/ NR
 - Response: UNCHE, UNEP, Ministries, laws
- II: Environment and Development (1972-02)
 - Challenge: UNCHE, WCS, WCED, Shocks
 - Response: UNCED, A21, WSSD, JPOI
- III: Sustainable Development (1992-12)
 - Challenge: Shocks Redux (Multiple Crises)
 - Response: Mainstreaming (Green Growth)

The Impact of Crises, 1973-2008

- **Commodities Shocks (Food, Energy)**
 - Food security, funding commitments
 - Problem: delivery on commitments
- **Economic Shocks (Finance, Recession)**
 - Stimulus packages
 - Problem: procyclical for developing countries
- **Climate Shock (and Ecological Shocks)**
 - Carbon price, carbon tax
 - Problem: Energy Access

Governance Evolution

- I: The Turn to Advocacy
 - Pollution (Clean Air Acts, EPAs, POPs)
 - NR (Protected Areas, Forests, Water)
- II: The Turn to Knowledge
 - NSDS, EIA, data and analysis (WCMC, IPCC), awareness, disclosure (ISO, CSR, PIC)
- III: The Turn to Institutions
 - IEG, “Pilot” ETR, Capacity, Participation
- IV (?): The Turn to Action?

The Key Role of NSDS

- Agenda 21—call for strategies for sustainable development
- Rio+5: formulate and elaborate by 2002
- MDG 7, target 9: Integrate SD principles into country policies/programmes
- JPOI: begin implementation by 2005
- World Summit 2005: NSDS central to achievement of SD

SD Principles

- Integration
- Inter-generational equity
- Intra-generational equity
- Reduce and eliminate unsustainable patterns of production and consumption
- Participation in decision-making
- Access to information
- Access to judicial and administrative proceedings

NSDS Definition

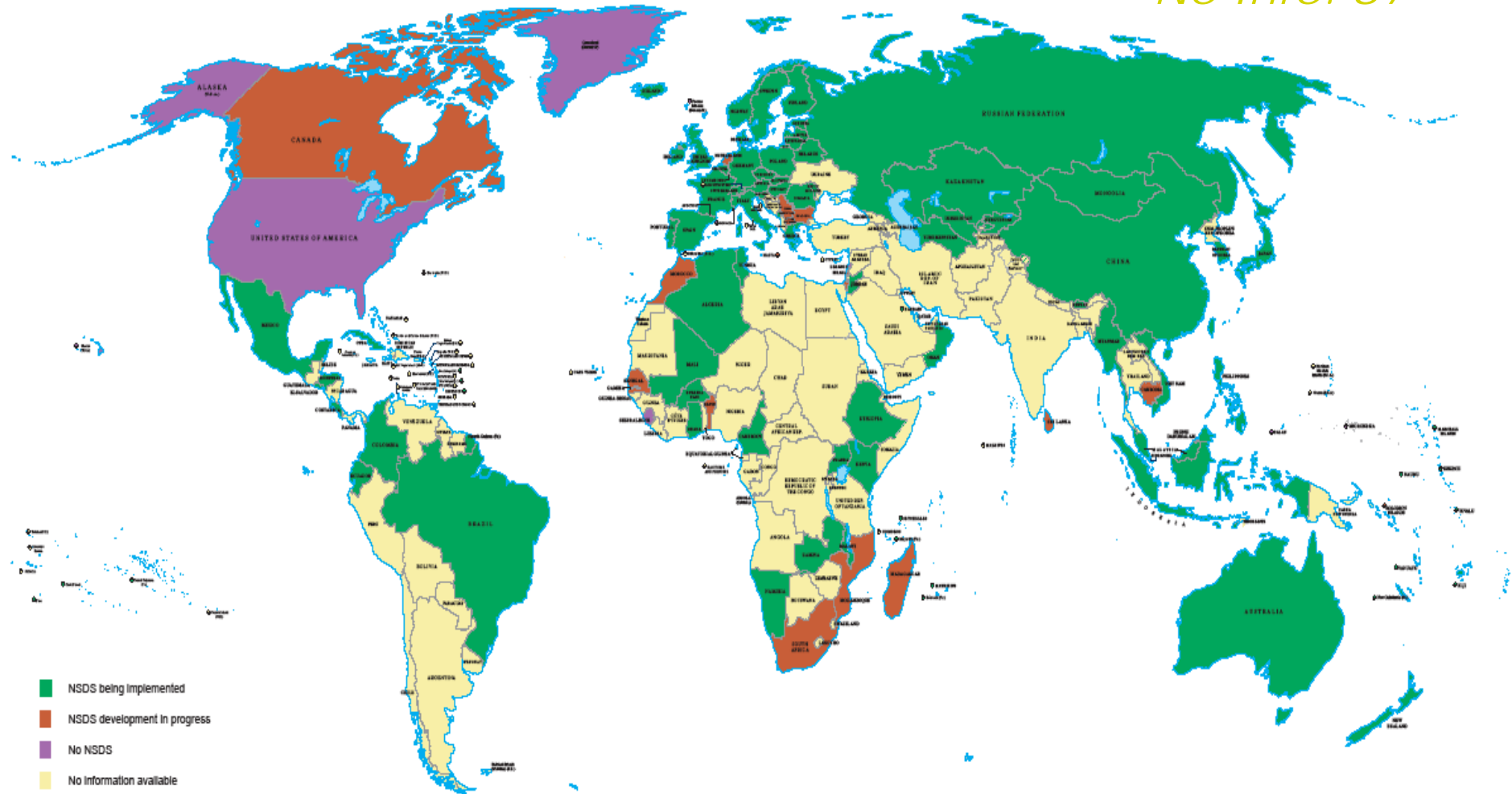
A coordinated, participatory and iterative process
to achieve economic, environmental and social objectives
in a balanced and integrated manner



The formulation and implementation of NSDS's is a cyclical and interactive process of planning, participation and action, in which the emphasis is on managing progress towards sustainability goals, rather than producing a "plan" as an end product.

National sustainable development strategies: The global picture

Yes 82 (16%+)
In Process: 16
No: 6
No Info: 87



The map tracks progress towards the WSSD (2002) target for countries to formulate and begin implementation of national sustainable development strategies by 2005. The map is updated on a regular basis. We encourage Governments to submit new information or advise us of corrections through csd@un.org.

Last update: 4/30/2008

The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or any area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

* Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status has not yet been agreed upon by the parties. Cross-hatch with the colours used for Jammu & Kashmir (neutral colour) and China

The Turn to Action: Green Growth

- 3 Principles:
 - Minimize Energy and Resource Use
 - Minimize Environmental Pressure
 - **NEW: Make investment on environment a driver for economic growth**
- Recessions as opportunity
- Mainstream sustainability into economic decision making
- Central attention to Energy and Climate

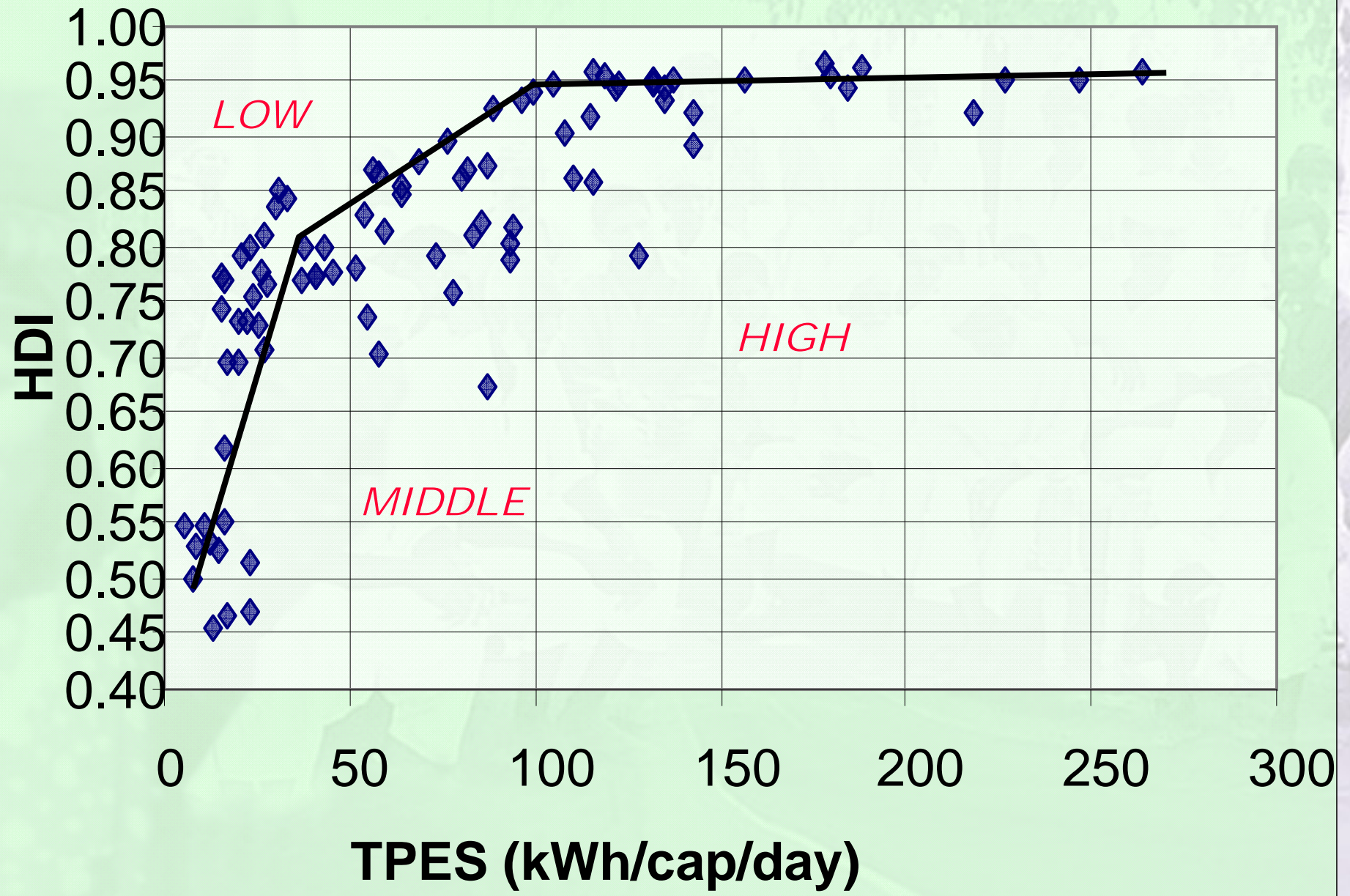
Energy, Development, Climate

- Contribution to human progress
- Energy access
 - Strongly correlated with HD indicators
 - 3-4 fold expansion needed in developing countries
- Over 75% emissions
 - Rising faster than aggregate emissions, especially developing country because of energy growth (3 to 5%) outrunning rising efficiency
- Affordability
 - PCI, Energy share, HDI

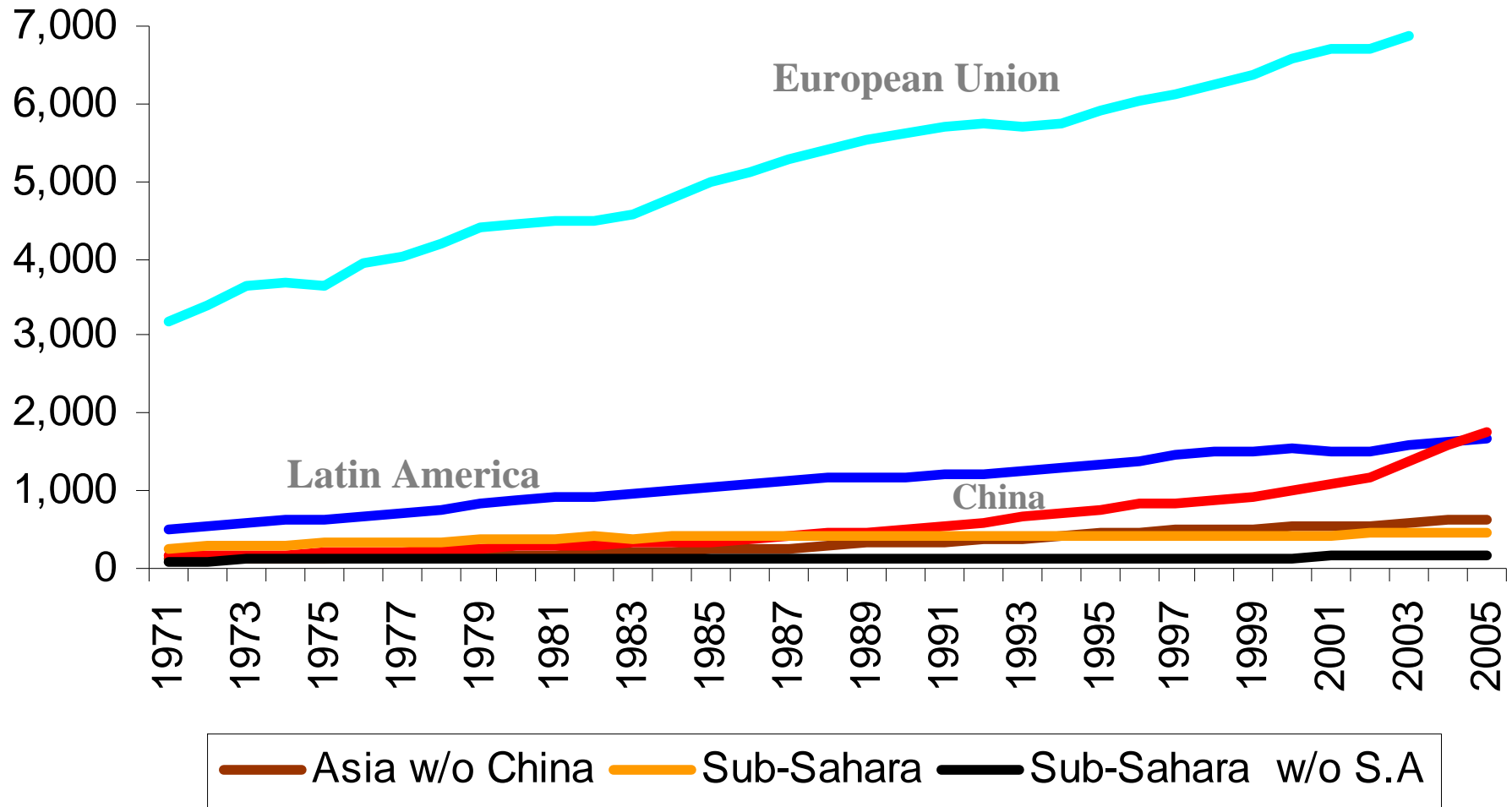
Scenario characteristics

(34 scenarios, IPCC/WEC)

	1800	2000	Δf	2050	Δf
Population (billion)	1	6	x6	10	x1.6
GDP (trillion 1990 \$)	0.3	30	x100	85-110	<x3-x4
Primary energy (EJ)	13	420	x30	600-1,040	x1.5-x2.5
CO ₂ emissions (GtC)	0.3	6.4	x20	5-15	<x1-x3
Mobility (km/person/day)	0.04	40	x1,000	120-160	x3-x4



Electricity use per capita (kWh/capita) in World Regions



➤ Is per capita electricity consumption sufficient to satisfy basic needs?

Energy Consumption (kWh/cap/day)

Country	Final	Excluding industry	TPES	Electricity
US	167.07	137.26	246.62	39.01
Germany	98.09	76.05	134.84	20.39
Korea	95.71	68.96	142.83	21.12
China	29.19	16.41	45.63	4.61
India	10.87	7.74	16.25	1.61
Brazil	30.39	18.27	37.73	6.41
Nigeria	20.85	18.59	23.13	0.43

Energy (kcd), GDP (\$), Prices (c/kWh)

Region	TPES	Electricity	Prices	PCGDP
World	55	6.8 (1.8)	3-30	8,579
OECD	174	25.6 (6.6)	10-20	39,345
China	45	5.3 (0.7)	..	2770
India	16	1.3 (0.3)	4	1010
Africa	16	1.6 (0.4)	5+	1082
Brazil	38	6.4 (1.2)	9.3	7350
Korea	143	21.1 (3.0)	9.8	21530
Russia	145	15.9 (1.9)	..	9620

What is Affordable Where?

Income \$/cap/day	Energy Budget 10%	Affordability kWh/day at prices (cents/kWh)		
		6	10	20
India (\$2)	\$0.20	3	2	1.0
Egypt (\$5)	\$0.50	8	5	2.5
China (\$7)	\$0.70	12	7	3.5
Peru (\$10)	\$1.00	17	10	5
Croatia (\$30)	\$3.00	50	30	15
OECD (\$100+)	\$10.00	166	100	50

How Developing Countries Cope?

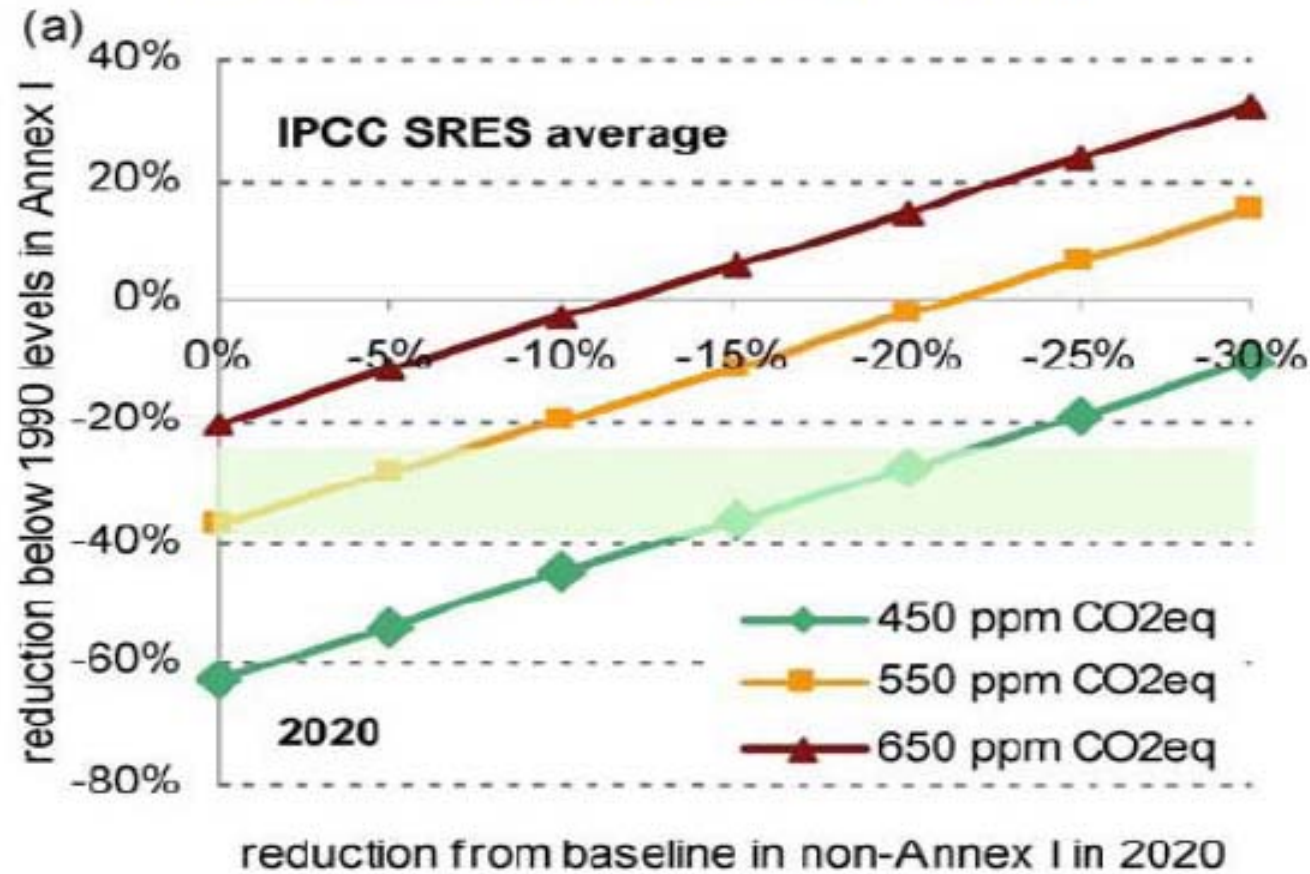
- *Exclusion*: Many people have no access to modern energy.
- *Environmental stress*: Reliance on inefficient but cheap biomass
- *Regressivity*: Energy expenditure share falls with income (2- 30%, median 10%).
- *Targeted Subsidies*: block tariffs, low diesel and kerosene prices, low quality public transport.

Climate and Development

- Pressure is being placed on developing countries to undertake mitigation—by some calculations more than developed countries.
- Challenge is to reconcile this demand with the need to maintain growth
- Two approaches: separate versus mainstreamed climate and development policies

Trade-offs in reductions for Annex I and Non-Annex I emissions for different stabilization levels

Source: den Elzen and Hohne, Climatic Change Policy, 2008.



Reconciling two Strategies

- *Adjustment*: The emerging global climate strategy seeks to **raise conventional energy costs** (by raising carbon costs (carbon tax or cap and trade)).
- *Investment*: Developing countries have tried to address energy poverty and HD by **lowering the costs** of energy for low income groups, through investment (including technological learning), but with subsidies in Short Run

Green Growth for All

- Environmental Investment as Driver: Enable developing countries to leapfrog—not “pollute first clean up later”.
- Renewable energy at \$1/W!
 - How to lower costs
 - How to make renewable energy affordable
- Globally partnership on RE

IEA: Assumed Learning Curves

	2006-10	2011-20	2021-30
Biomass	5%	5%	5%
Geothermal	5%	5%	5%
Large Hydro	1%	1%	1%
Small Hydro	1%	1%	1%
Solar PV	17.5%	15%	10%
Solar thermal	13%	10%	7.5%
Tidal /Wave	15%	12.5%	10%
Wind onshore	0%	6.5%	5%
Wind offshore	0%	20%*	15%*

Partnership for Green Growth

- *Global Feed-in-Tariffs*: Identify technologies, consumers, and subsidies. A fund of \$100 bn annually 2010-20. Channeled through energy systems on the basis of output delivered.
- *Global Climate Corps*: Patterned on the Civilian Conservation Corps during the New Deal and the Peace Corps from the 1960s, a cadre of professionals to support energy efficiency and renewable energy initiatives
- *National Support*: Patterned on the Green Revolution, support for institutions of research, extension, credit, and inputs provision in the energy sector.