

# Addressing Climate Change With Development

*World Economic and Social Survey 2009:  
Promoting Development, Saving the Planet*

*October 2009*

# Background

- Development is a **positive-sum game**
- Climate change is largely being viewed as a **zero sum game**, and this inhibits cooperation and effective action
  - Mueller's three models: sovereign, conditional, and joint commitments
- A **development-based approach** to climate change can transform it from zero- to positive-sum game

# A Development-Based Approach

- *Joint Goals:*
  - North: full employment and energy security
  - South: catch-up growth and energy access
- *Elements:* investment, policy guidance, strategic direction
- *Focus:* Consensus, Momentum, Transparency
- *Results:*
  - Enable developing countries to leapfrog
  - Stimulate private sector in North as well as South
  - Promote cooperation

# The Challenge

- Immediate Need
  - *North*: **reduce emissions** without compromising the goals of full employment and economic stability
  - *South*: **slow** (+ eventually reduce) **emissions** without compromising development momentum
- Success Criterion
  - *North*: enable climate friendly alternatives to become competitive with fossil fuels
  - *South*: **make modern energy services affordable**

# WESS: Key messages

- An **Investment-led approach** for both goals
- Investments must be **front-loaded**, given danger of lock-in and importance of **scale + learning economies** for technology leapfrogging
- Strategic public investment to **crowd-in** private investment through integrated policies
- Concentrate the **international transfers** (finance + technology) on the **big push**

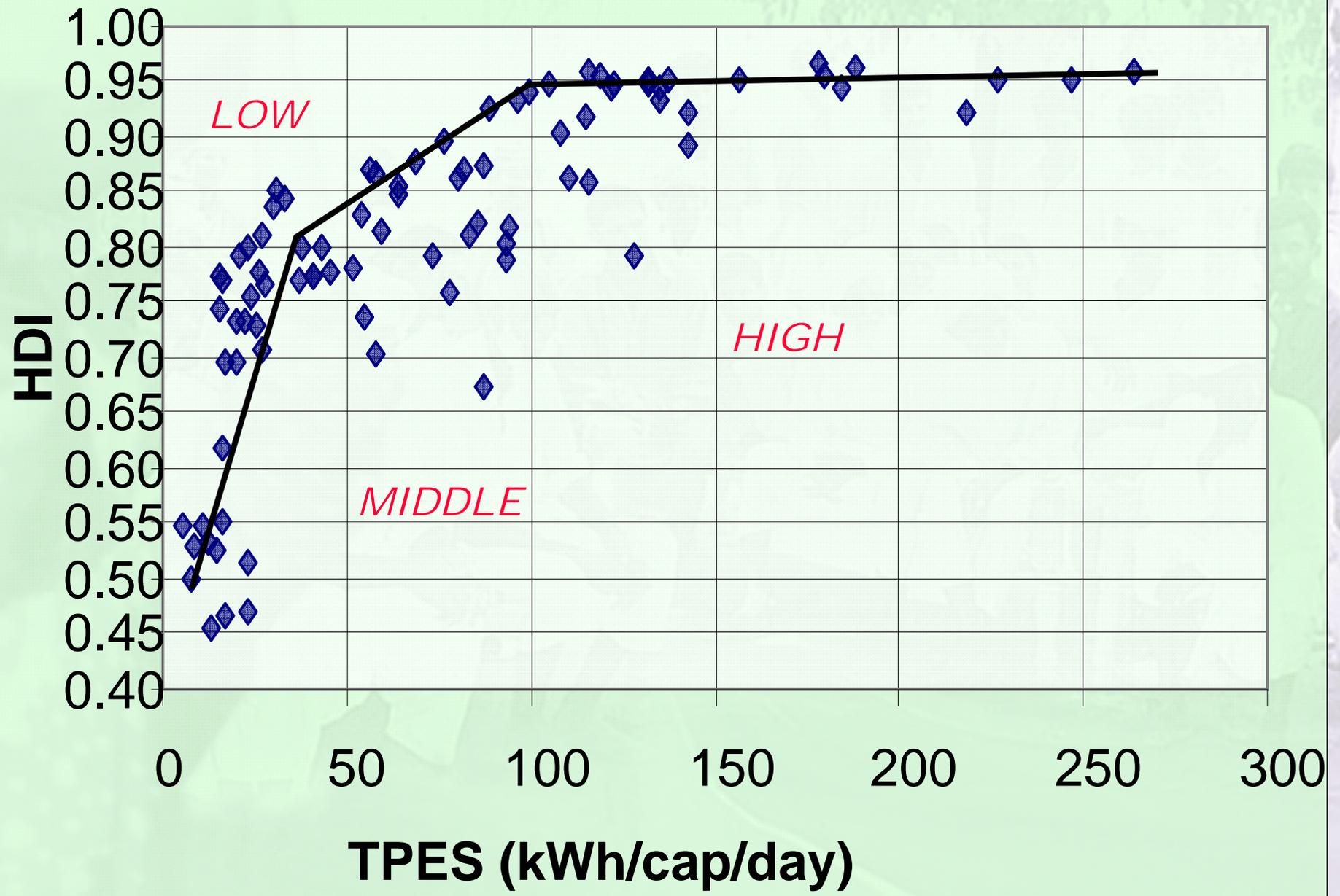
# Why Focus on Energy?

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

# Scenario characteristics

(34 scenarios, IPCC/WEC)

	1800	2000	$\Delta f$	2050	$\Delta f$
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 <sub>2</sub> emissions (GtC)	0.3	6.4	x20	5-15	<x1-x3
Mobility (km/person/day)	0.04	40	x1,000	120-160	x3-x4



# Energy Consumption (kcd)

Country	Final	Industry %	TPES	Electricity
US	167.07	17.84	246.62	39.01
Germany	98.09	22.47	134.84	20.39
<b>Sweden</b>	122.77	34.73	<b>180.03</b>	45.67
Korea	95.71	27.95	142.83	21.12
China	29.19	<b>43.44</b>	45.63	4.61
India	10.87	28.79	16.25	1.61
Brazil	30.39	39.88	37.73	6.41
Ghana	10.23	15.35	13.16	0.79
Tanzania	13.21	10.98	16.79	0.19
Bangladesh	4.11	15.09	5.13	0.42

# 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)	..	2,770
India	16	1.3 (0.3)	4	1,010
Africa	16	1.6 (0.4)	5+	1,082
Brazil	38	6.4 (1.2)	9.3	7,350
Korea	143	21.1 (3.0)	9.8	21,530
Russia	145	15.9 (1.9)	..	9,620

# What is Affordable Where?

Income \$/cap/day	Energy Budget 10%	Affordability kcd 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?

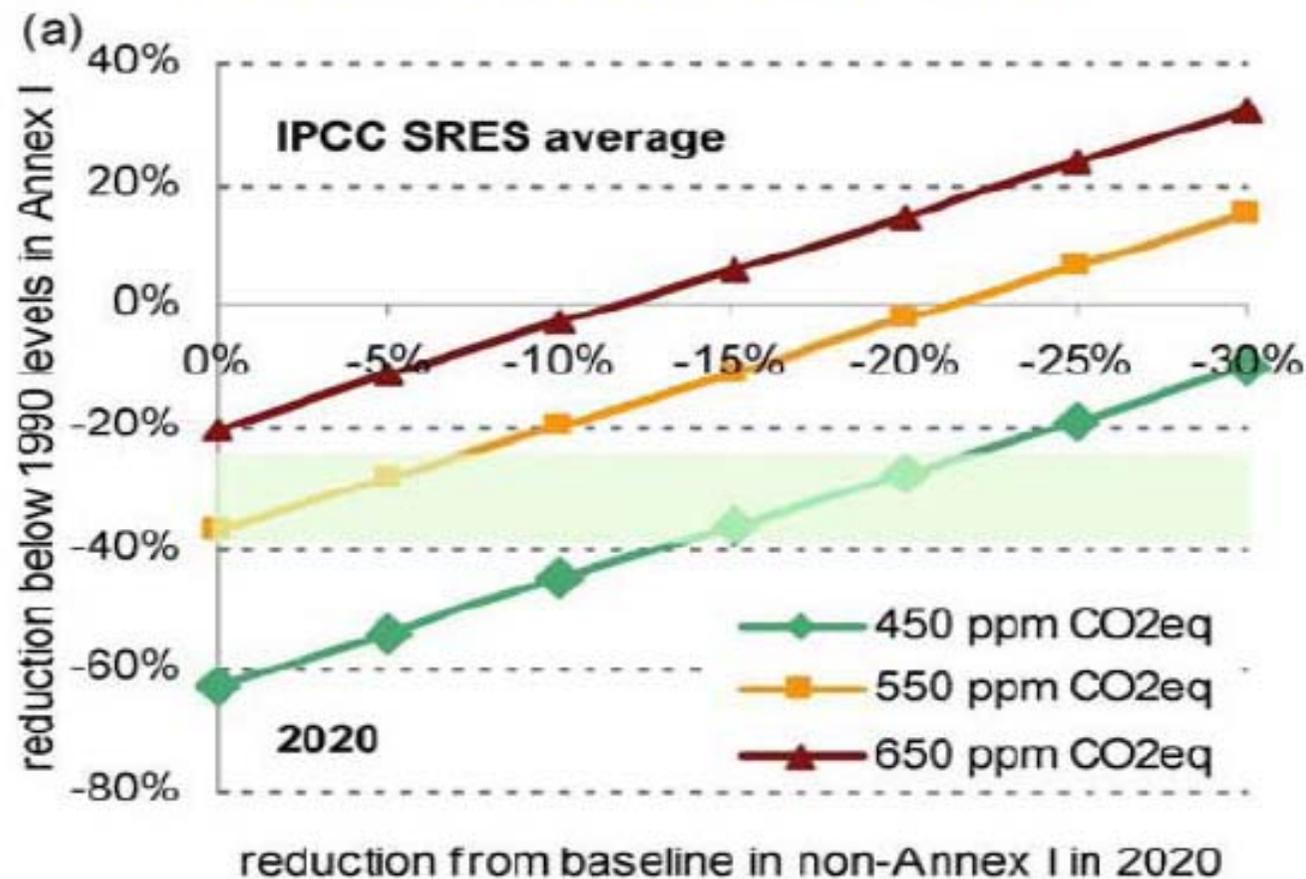
- *Exclude*: Limited access to modern energy
- *Use Nature*: inefficient but cheap biomass
- *Regressive*: Energy expenditure share falls with income (2- 30%, median 10%)
- *Quality*: e.g., cheaper buses, appliances, building materials
- *Targeted Subsidies*: block tariffs, low diesel and kerosene prices

# Climate and Development

- Pressure on developing countries to mitigate—by some calculations more than developed countries.
- Challenge is to reconcile this demand with the need to maintain growth
- Two approaches:
  - Sovereign commitments: The *Adjustment Model*
  - Joint commitment: The *Investment Model*

## 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.



# Strategy Under Two Alternatives

- *Sovereign Commitments*: The unifying strategy under this approach is to **raise conventional energy costs** (by raising carbon costs (carbon tax or cap and trade)).
- *Joint commitment*: Since developing countries need to **lower the costs** of energy especially for low income groups to address energy poverty and HD, the unifying strategy is the promotion of investment.

# Green Growth for All

- Environmental Investment as Driver: Enable developing countries to leapfrog—not “pollute first clean up later”.
- Set common targets for renewable energy investment costs (\$1/W!)
  - How to lower costs
  - How to make renewable energy affordable
- Global partnership on RE

# Global Partnership



- Elements of Successful Partnerships
  - Common and shared goals
  - Demonstrable results
  - Time bound commitments
- Elements of several (though not all) climate related proposals
  - Separate but equal goals
  - Vague relations between efforts and results
  - Open ended commitments

# The Global Feed in Tariff Approach

- Definition of feed in tariffs policy
  - Guarantee that any renewable energy generated will be purchased (“fed into”) by the power grid at given rates (tariffs), different for different technologies, and declining in future years
- Over 50 countries have such policies
- In developing countries, low final energy prices require subsidies, but these are constrained by limited public resources
- A global regime will supplement national commitments with global resources

# Advantages

- Common and shared goals
  - Renewable addresses economic and human development goals as well as climate objectives
  - Global subsidy pays only incremental costs
  - Reduction in unit costs helps both North and South
- Demonstrable results
  - Output based funding: payment is made only when renewable energy is delivered to consumers
- Time bound commitments
  - As unit costs fall (depending on how quickly scale is ramped up) and incomes rise, subsidy disappears

# How to Fund the Program?

- There is broad agreement over the need to scale up existing funds and combine with innovative new sources of financing. Options include:
  - **Official development assistance**
  - **Carbon credits** (but need higher emissions commitments to bring about deeper cuts)
  - **International taxes** (e.g., on financial speculation, aviation, or a progressive global levy on incomes)
  - **Reallocation** of existing spending

# Technologies with Rapidly Declining Costs will Move Fastest

	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*: Support for all technologies, and poor consumers. 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.

# Thank you

*World Economic and Social Survey 2009:  
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Please visit the following websites:

UN-DESA [www.un.org](http://www.un.org)

Research papers, policy briefs, others

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