

Financing the Transition to Clean Technologies

Joyashree Roy
Coordinator Global Change Programme-JU
Professor and Head
Department of Economics
Jadavpur University, Kolkata: 700 032

Presented at Pune: WISE April 22-23, 2008

Blame game

- Individual producer/consumer behaviour related question
- People are not investing in new ET ?
- You and me argument
- Not enough CDM money flowing across borders?
- Is developed country transferring the technologies to developing country?
- Investment environment/investor behaviour
- How much new R &D investment?
- Why not the venture capital coming in this sector?
- How banks are financing new projects?
- What is the subsidy given to this sector?

Resulting in pessimistic view

- Ending up in all negotiations, seminars and conferences, awareness programmes with pessimism
- Nothing will happen because we will not change
- Nothing will happen because US is not doing anything
- Nothing will happen because technologies are not transferred by (technology) have to have not-s (technology)
- Not enough domestic investment coming up

Handholding tour

To show the Ray of Hope
How can we make it happen

Let's revisit our Pessimism

- We will not change
- Investor response question
- You and me question

- What we need
 - Asking Right question
 - Taking Lead in Voicing Right Demand
 - Disseminating Right Information

Do we not change fast ?

TV
Mobile
Automobile
Fuel efficient motors
Solar water heaters

Has there not been any change in life style?
Has not market signals played a role
Has not enabling policies made the transition
faster?

We do change

Question is same because it is merely asking for popularising “desirable” new technology more efficient, benign.....

What is wrong in ET?

- Less demand
- Why?
- Given the existing policies we find polluting technologies relatively cheaper
- Technology types: switching of fuel, material, mode of transportation, land use planning

We are asking wrong questions!!!

In a tech-savy society why are we concerned how new technologies can be made to penetrate?

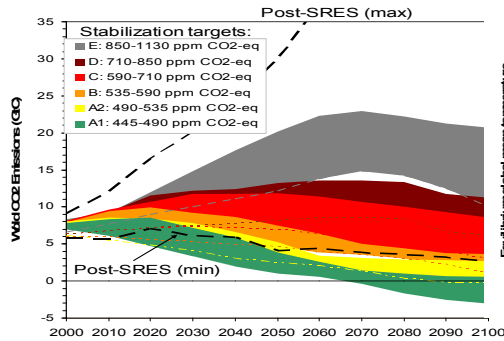
We blame behaviour to have lack of inertia ?

Actually it is Lack of right kind of incentive
(first session on 23rd)

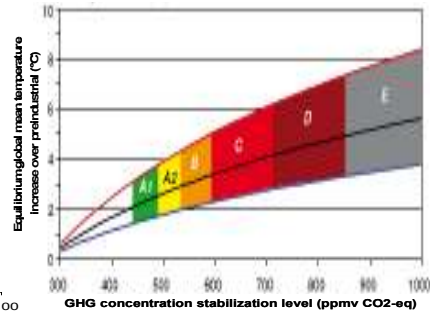
Investor response question

- Barrier is *as if* less investment
- We know the new technologies
- We just need a regime change/paradigm shift through investment

The lower the stabilisation level the earlier global emissions have to go down

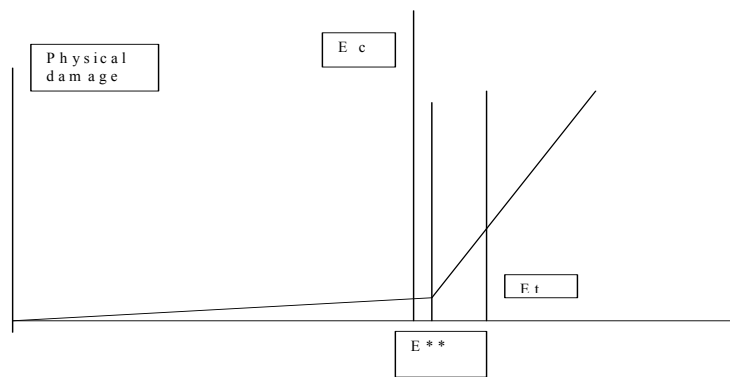


Multigas and CO2 only studies combined



Source: IPCC 2007

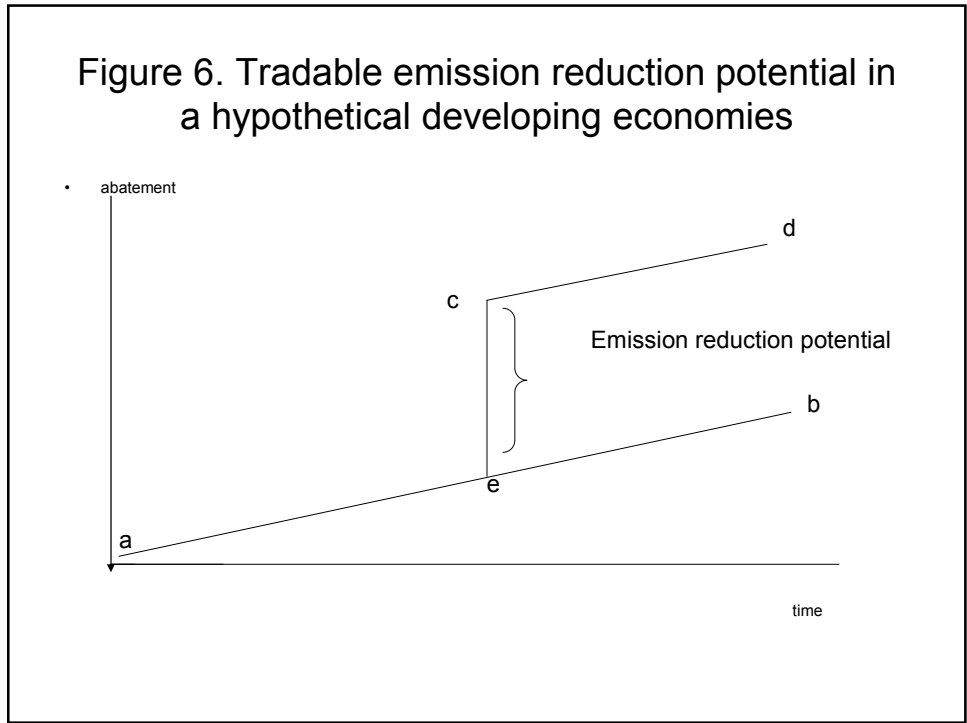
Figure 2. Threshold and damage function



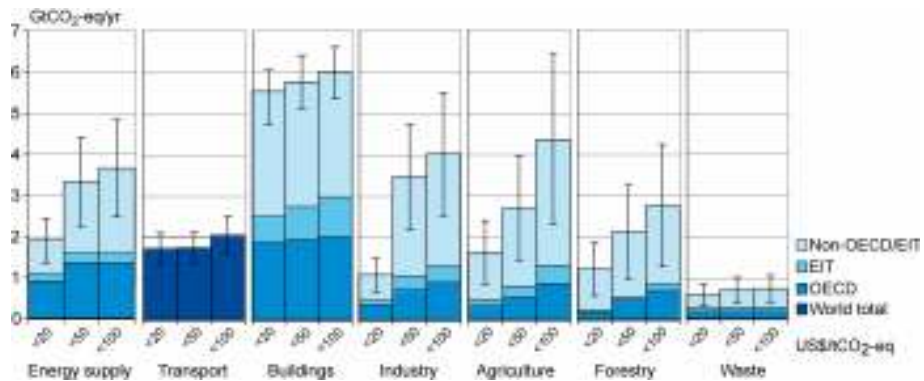
E_c : current level of 430 ppm
 E^{**} : 450 ppm threshold
 E_t : target stabilisation of 550 ppm

Roy, 2008

Figure 6. Tradable emission reduction potential in a hypothetical developing economies



All Sectors and Regions have Potential to contribute to mitigation



Source: IPCC 2007

Note: estimates are for 2030 and do not include non-technical options, such as lifestyle changes.

How can emissions be reduced from the energy supply sector?

Sector	Key selected mitigation technologies and practices currently commercially available.	Key selected mitigation technologies and practices projected to be commercialized before 2030.
Energy Supply	efficiency; fuel switching; nuclear power; renewable energy (hydropower, solar, wind, geothermal and bio-energy); combined heat and power; early applications of CO2 capture and storage (CCS)	CCS for gas, biomass and coal-fired electricity generating facilities; advanced nuclear power; advanced renewable energy (tidal and waves energy, concentrating solar, solar and solar PV)

How can emissions from transport be reduced?

Sector	(Selected) Key mitigation technologies and practices currently commercially available.	Key mitigation technologies and practices projected to be commercialized before 2030. (Selected)
Transport	More fuel efficient vehicles; hybrid vehicles; biofuels; modal shifts from road transport to rail and public transport systems; cycling, walking; land-use planning	Second generation biofuels; higher efficiency aircraft; advanced electric and hybrid vehicles with more powerful and reliable batteries

How can emissions from industry be reduced?

Sector	(Selected) Key mitigation technologies and practices currently commercially available.	Key mitigation technologies and practices projected to be commercialized before 2030. (Selected)
Industry	More efficient electrical equipment; heat and power recovery; material recycling; control of non-CO ₂ gas emissions	Advanced energy efficiency; CCS for cement, ammonia, and iron manufacture; inert electrodes for aluminium manufacture

How can emissions from buildings be reduced?

Sector	(Selected) Key mitigation technologies and practices currently commercially available.	Key mitigation technologies and practices projected to be commercialized before 2030. (Selected)
Buildings	Efficient lighting; efficient appliances and airconditioners; improved insulation ; solar heating and cooling; alternatives for fluorinated gases in insulation and appliances	Integrated design of commercial buildings including technologies, such as intelligent meters that provide feedback and control; solar PV integrated in buildings

How can emissions from agriculture and forestry be reduced?

Sector	(Selected) Key mitigation technologies and practices currently commercially available.	Key mitigation technologies and practices projected to be commercialized before 2030. (Selected)
Agriculture	Land management to increase soil carbon storage; restoration of degraded lands; improved rice cultivation techniques; improved nitrogen fertilizer application; dedicated energy crops	Crop yield improvement
Forests	Afforestation; reforestation; forest management; reduced deforestation; use of forestry products for bioenergy	Improved species and productivity; remote sensing systems

Transition to Clean Technologies

Supply side question
(long run and short run)

How ? more investment can come
to
supply the clean technologies

Wrong messages

- Less return in new technologies per se
- Studies show if we correct prices: include true cost of coal/oil/ dirty fuels.. ..or consider the social benefits of new technologies then return is much higher even more than 16-20%
- Change policies to make these profitable

Not enough demand

- Relative prices of new technologies are higher
- Wrong pricing of conventional fuels, technologies
- Correcting prices through regulation not new for us

What is right question to ask and answer?

- What is wrong in the market place that is not triggering right responses?
- Correcting the distortions in prices:
Relative fuel prices
- To help mainstream Backstop technology

Prices are not reflecting true value

- Prices of coal: value of labour used+value of machine used+ value of natural capital used(?) which the society and across generations owns? (user cost)

Why not happening?

- Will hurt people
- Will hurt consumers
- Will hurt producers
- Welfare will be reduced

- Political agenda more than scientific approach
- Wrong notions of welfare as performance indicator for countries.

Why not happening in ET?

Price correction

- **Enabling policies need to be global , negotiated**

Bali: innovative solutions needed

You and me logic

CDM
Free riding

Need to come out of 'voluntary'
action

Find innovative solutions for
Polluter pay principle

an alternative suggestion

Climate Debt Repayment

- Intergenerational equity
- Historical emission

- CDM-Adaptation Fund
 - vs
- Avoided Mitigation Fund

CD “M”

- **Rio to Bali we are making efforts to build alternative institutional arrangements for international cooperation to address climate change problem.**

Time to Revisit CD “M”

- CDM helped in transferring in million dollar range
- AMF can generate trillion dollar transfer answers Stern question
- Avoids **Ethical question who owns the right to global common?**
- **Start a fresh agreement for 2012 and beyond on level playing ground with Total emission cap**

Mainstreaming Climate Change

Mainstreaming Climate Change

- Price correction to provide incentive to micro behavioural response
- Performance indicator from country response: Green accounting frame work (NATCOM data need to be integrated with macro accounting framework)
- New regime for 2009-2012 (debt repayment framework) and 2012 beyond cap and trade

What should be there in new negotiation

- Negotiation on new global fuel price policies
- AMF
- New cap-trade regime

- NATCOM : Inventory of technology
- Reporting of R & D investment
- Reporting of Technology deployment
- Reporting of Corrections in fuel prices

Let's understand (!!!!!!!) the topic of
discussion
and
then let's see what are the right
questions?

Why blame human habits?

- We adjust so fast to adopt change in
 - Communication mode ..
 - Dress ..
 - Pizza habit (advertisement, promotion, new entrant policy)
 - Watching TV (competitive prices)
 - Going places (travel cost)
 - Migration (wages)

 - Very fast controllable variable and that too through market prices
 - Crux is freedom of choice be given (like a child)

Right questions

- Question to research and ask is how much in fuel prices we need to make correction?
- Movement should be to put pressure on policy makers and politicians to correct prices, incentives
- This SHOULD BE GLOBAL ACTION
- Negotiation : measurable action should be towards this.

What should be the content of awareness programmes?

- **New ideas:**
 - Current market structure which is a human construct is unable to provide right kind of signal to trigger right kind of behaviour
 - Who has given each one of us the right to throw our garbage (visible or invisible) on to the society?
 - We need to pay both for private good and social good
- **New message:**
 - Who will be hurt:
 - only those with luxury consumption
- We need to raise voice to correct the distorted incentives so that we can make right choices

Some back of the envelop calculations

- 1.2 GT 1994 India baseline GT CO2 eq
- 6.1 GT US
- GDP at current market prices is projected at Rs. 46,93, 6 billion in 2007-08
- Cost : let us assume 1% of GDP
- 460 billion Rs. needed for investment
- Construction investment 8000 billion
- Industry investment 40,000 billion

Some back of the envelop calculations

- Construction sector investments is over Rs 8 trillion
- Consistent with the above projection, the investment in physical infrastructure alone during the Eleventh Five Year Plan has been estimated to be about Rs. 2,002 thousand crore (at 2006-07 prices which is equivalent to about US\$ 500 billion: @ Rs. 40/\$).

Bali Action Plan

India can take leadership in innovative solutions

Launch a comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to and beyond 2012.....