



# **International Architectures - An Overview -**

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**IPIECA Workshop - International Policy Approaches  
to Address the Climate Change Challenge**

**Beijing, 25 October 2005**



# Outline

- **Reasons for collective action**
- **Kyoto Protocol and CDM**
- **Non-quantitative approaches**
- **Quantitative emissions approaches**
- **Addressing uncertainties**
- **Summary**



## **Reasons for collective action**

- **Climate is a public good**
  - ◆ **Undersupplied by countries in isolation**
- **Issues of competitiveness/fairness**
- **Cost-effectiveness:**
  - ◆ **Static: broad markets offer more opportunities for cheap reductions**
  - ◆ **Dynamic: learning-by-doing processes reduce costs of nascent technologies**
- **Technology transfers**



# Extent of agreements

- **The UNFCCC:**
  - ◆ **Almost universal participation**
  - ◆ **Common, but differentiated responsibilities**
  - ◆ **Ultimate objective**
- **The Kyoto Protocol**
- **The G8 'plus'**
- **Plurilateral agreements**



# The Kyoto Protocol

- ♠ **Fixed targets the only option**
  - ♠ Rejected by developing countries and some industrialised countries
  - ♠ Do not address uncertain abatement costs
- ♥ **Emissions trading powerful tool**
  - ♥ Cost-effectiveness, key for environmental ambition
  - ♥ Allows negotiators to focus on acceptable objectives
  - ♥ Allows combining free allocation and auctioning
  - ♥ Mobilises public and private money



## Merits and limits of the CDM

- ♥ Allows to take advantage of low cost opportunities
- ♥ Contributes to sustainable development
- ♣ High transaction costs
  - ◆ But do not judge it prematurely!
- ♠ Does not alleviate concerns for competitiveness and leakage
  - ♠ Based on host country standards



# Non Quantitative Approaches

- **Policies and measures**
- **Carbon taxes**
- **Technology agreements**
- **No cap but trade**



# Policies and measures

- **Various policies needed, even if the carbon externality is priced**
  - ◆ **Numerous market imperfections**
    - Information gaps
    - Landlord-tenant situations
    - Non-strategic issues
  - ◆ **Long term technology development policies**
- **A base for global co-ordination of efforts?**
  - ◆ **Efforts are difficult to compare**
  - ◆ **Concerns about competitiveness & fairness**





# Carbon taxes

- **Taxes address cost uncertainties**
  - ◆ Spontaneously adjust abatement levels to actual costs
  - ◆ Ambition must be preferred to certainty on emission levels, as concentrations, not emissions, drive climate change
- **Taxes may offer double dividend**
  - ◆ Revenues may allow to reduce other distortionary taxes
- **Taxes politically difficult**
  - ◆ Efficiency requires same tax level globally
  - ◆ Concerns about competitiveness if not global
  - ◆ Vested interests
  - ◆ Public opinion



# Technology agreements ?

- **Non-CO2 global norm as stand-alone**
  - ◆ E.g., all power plants and fuels should be zero emissions in 2020 (developed countries)
  - ◆ Politically very difficult
  - ◆ « Hundreds of end-use technologies » (IPCC)
  - ◆ Technical change needs R&D push and market pull
- **Useful complement to market-based instruments**
  - ◆ Markets undersupply basic research
  - ◆ Markets are short-termists
- **International technology collaboration**
  - ◆ The US-led technology partnerships
  - ◆ IEA's Technology Implement Agreements



## **No cap but trade**

- **All countries would have a non-binding target set on BaU trend**
- **A common institution would buy emission reductions to all**
- **It would be financed by all according to resources, e.g. following UN financing rules**



# Quantitative Emissions Approaches

- **Nature of targets**
  - ◆ Fixed / indexed
  - ◆ Binding / non-binding
  - ◆ Nation-wide / sectors
  - ◆ Price cap; action targets; long-term endowments...
- **Timing, allocation of efforts**
  - ◆ Multi-stage
  - ◆ Based on historical responsibility
  - ◆ Based on per capita
  - ◆ Based on costs



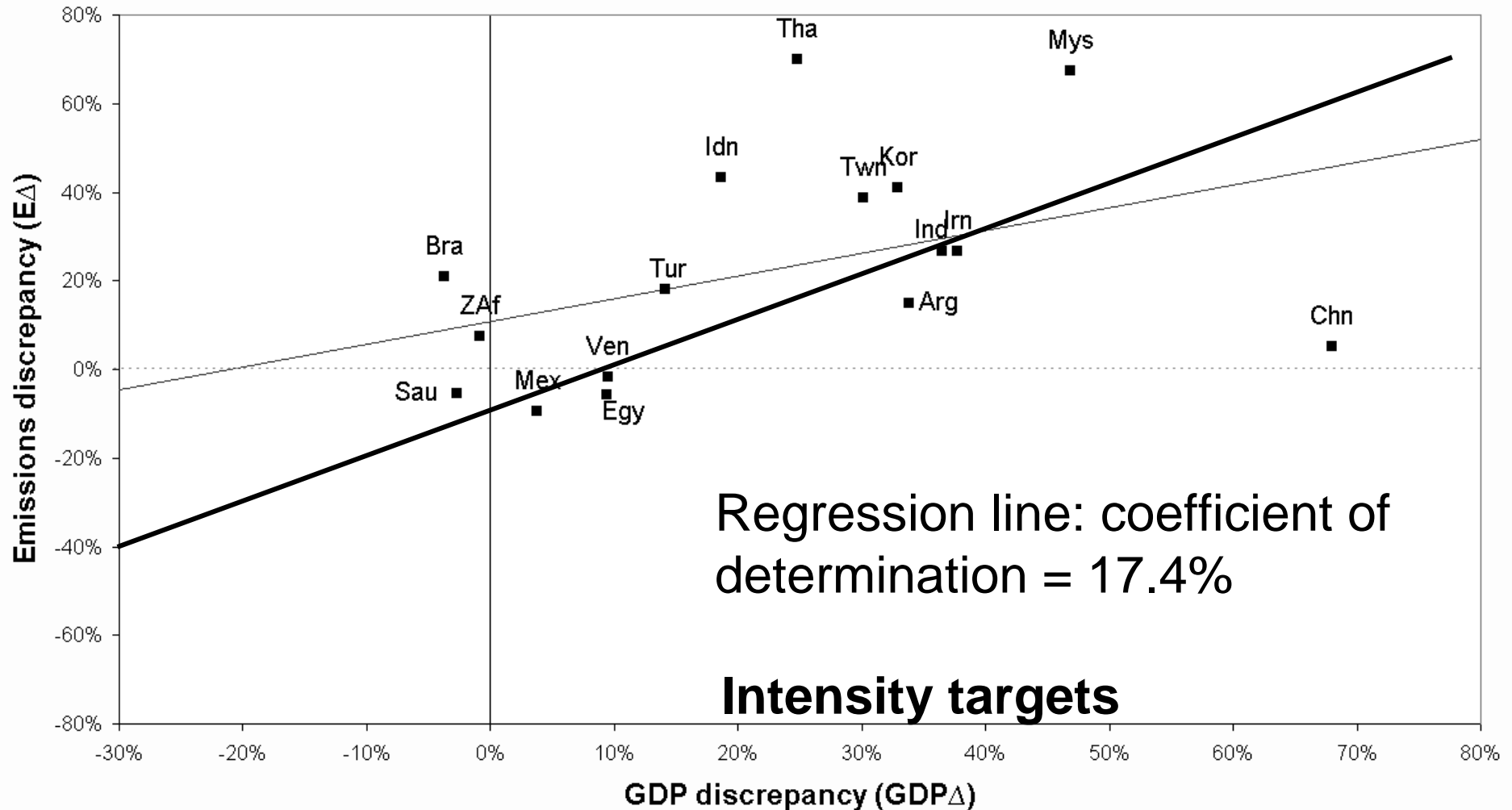
# Dynamic/intensity targets

- Assigned amounts based on an economic projection, then adjusted to deviations
- “Intensity targets” only a form: target in emissions per GDP
- Assigned amounts and indexation formulas can be differentiated
- Do not eliminate all sources of cost uncertainty
- How much do they reduce growth-related uncertainty?
  - ◆ A comparison of emissions and GDP trends (extrapolated from 1971 to 1991) and actual economic performances and emissions 1997 to 2001



# Intensity Targets: a reality test

non Annex I





# Non-binding targets

- **Surplus sellable, if any**
- **Incentive, no hard law**
- **Responsibility limited to units sold**
- **Targets on/close to BaU emission levels**
- **No risk for growth: development first!**
- **An option for developing countries only**
- **Similarities with the CDM**
- **Similarities with the 'price cap' concept**



## **Sector-wide targets/mechanisms**

- **Sector-wide targets for industry**
  - ◆ In some developing countries, or:
  - ◆ Transnational sectoral agreements
- **Sector-wide mechanisms**
  - ◆ To reward mitigation policies in transport or household sectors
  - ◆ Unilateral, sector-wide CDM projects to reduce transaction costs





# The price cap

- **Unlimited amount of supplementary permits available at a fixed price**
- **Price set in the upper range of expectations**
- **For countries or only economic agents**
- **Many possible uses of money (e.g. more R&D, more adaptation)**
- **A single price cap neither that difficult (differentiated targets) nor indispensable, but preferable for greater efficiency**



## Action targets

- **Target a percentage of actual emissions**
- **Aim to eliminate uncertainty on BaU emission trends**
- **Demonstrating the target has been reached may prove difficult**
- **And may take place too late to allow emissions trading**



## **Allowances and endowments**

- **The McKibbin – Wilcoxon proposal**
- **Permanent, long term endowments at a level compatible with stabilisation**
- **Short term allowances**
- **A « low-level » price cap (2.7\$/tCO<sub>2</sub>)**
- **Domestic emissions trading only**
  - ◆ **International trading seen as a problem, not a solution**
- **An complete alternative**



## **Long term permits**

- **(Much) longer commitment periods**
- **Equivalent to allow borrowing**
- **Real action may be deferred**
  - ◆ **Concerns about competitiveness**
  - ◆ **Weak incentives for emissions trading**
  - ◆ **Trigger for technology development may be insufficient**



# Compatibilty w. emissions trading

	International	Other types	Domestic	Domestic to international
Dynamic	♥	♥	♥	♥
Price cap	♥	♥	♥	♥
Non-binding	♥	♥	♥	♥
Sectoral	♥	♥	♥	♥
Action targets	♣	♣	♥	♠
Allowances Endowments	♠	♠	♥	♠
Long term	♣	♠	♣	♣



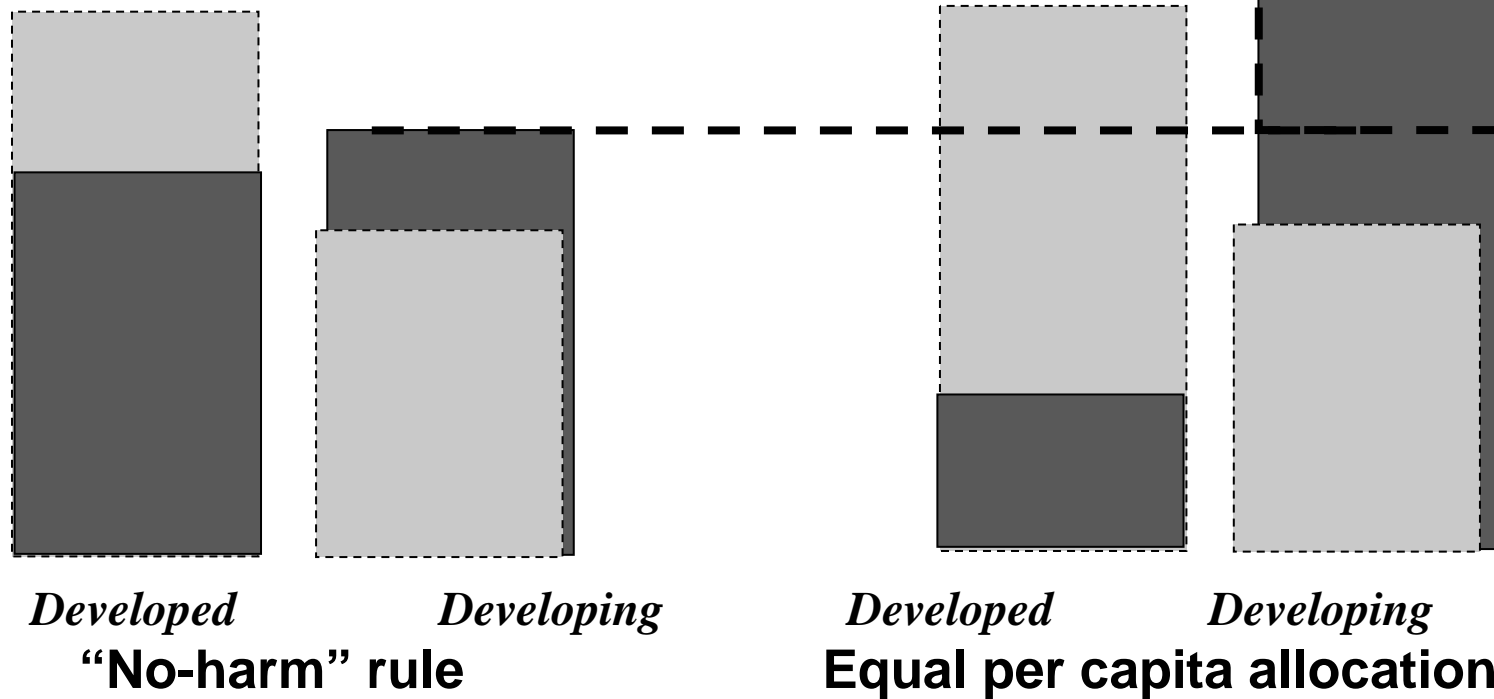
# Timing and allocation

- **Multi-stage**
  - ◆ **Already in the UNFCCC**
  - ◆ **Concerns about slow phase-in and competitiveness**
- **Global allocations**
  - ◆ **Based on « resource sharing »**
    - **Per capita emissions, possibly with historical responsibility**
  - ◆ **Based on the costs of changing course**
    - **e.g. 'no-harm' rule**



# No-harm vs equal per capita

Surplus allowances  
(above BaU)



□ Current Emissions

■ Assigned Amounts



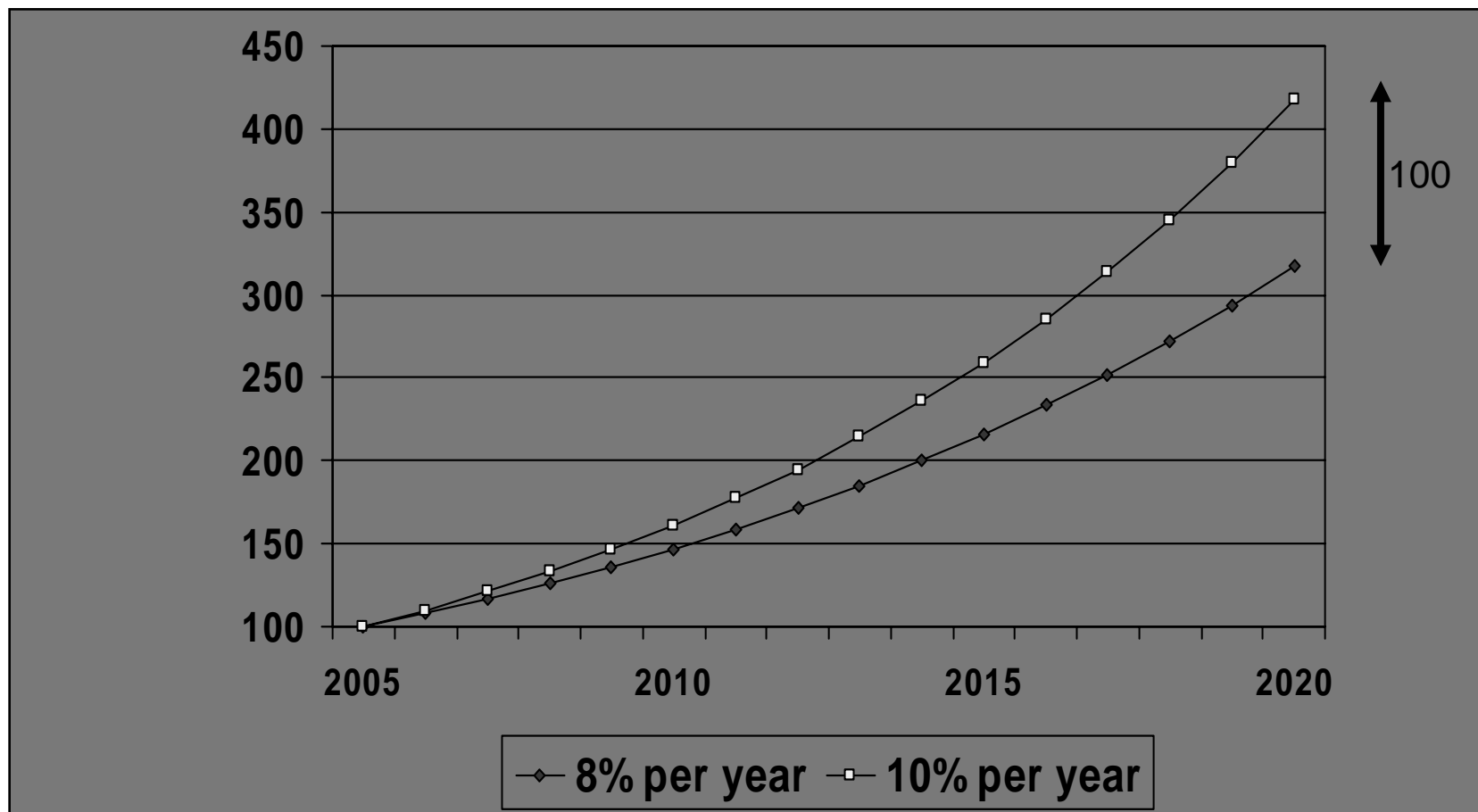
# Addressing uncertainties

- **On abatement benefits**
  - ◆ Emissions to concentrations
  - ◆ Earth's climate sensitivity (1,5 to 4,5°C)
  - ◆ Thresholds for non-linear responses
    - Forest dying, permafrost thawing, thermohaline circulation weakening...
- **On abatement costs**
  - ◆ BaU trends (demography, economy, energy prices, lifestyles, values);
  - ◆ Abatement technology availability & cost





# Uncertain economic growth





## **Uncertain ultimate objective**

- **To stabilise concentrations**
  - ◆ **levels and timing left undecided**
- **To "allow economic development to proceed in a sustainable manner":**
  - ◆ **to avoid disruptive climate change**
  - ◆ **to avoid disruptive response strategies**
- **Abatement costs cannot be ignored**
- **But cost benefit analysis impossible**



## **Certainty versus ambition**

- **Fixed targets provide certainty on emission levels at uncertain costs**
- **Taxes/price caps provide certainty on marginal costs for uncertain emission levels**
- **Climate change is a cumulative issue. Policy benefits relate to concentrations**
- **Abatement costs relate to emissions**
- **Certainty on short term emission levels has little value but may be costly**



# Price capping mechanisms

- **Price capping mechanisms increase the efficiency of agreements, providing for more ambitious policies at lower expected costs**
- **Easing the transition towards sustainable energy future and stable climate**
- **Ambitious policies with price caps perform day after day the cost benefit analysis that uncertainties prevent to perform once for all**
- **As science requires, targets and price caps may be revised at regular intervals**



# To sum up

- **Keep emissions trading**
- **Add new target options/features to address uncertainties and concerns**
  - ◆ **Dynamic targets (for all countries)**
  - ◆ **Price caps (for industrialised \_)**
  - ◆ **Non-binding targets (for developing \_)**
- **Complete with more technology policies, collaboration and transfer**



# Thank you!

## Further readings:

- ◆ **Beyond Kyoto (book)**
- ◆ **International technology collaboration (paper)**
- ◆ **Case study: clean coal technologies (paper)**
- ◆ **Approaches for future international co-operation (paper)**
- ◆ **Act Locally, Trade Globally (book)**
- ◆ **[www.iea.org](http://www.iea.org)**

