



Centre for Energy and
Environmental Markets

UNSW
THE UNIVERSITY OF NEW SOUTH WALES
SYDNEY • AUSTRALIA



Emissions trading to combat climate change:

The impact of scheme design on transaction costs

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Motivation

Assess the validity of the statement:

"Generally emissions trading (Cap and trade) will have lower transaction costs than project-based mechanisms such as the Clean Development Mechanism (CDM)"

Content of presentation

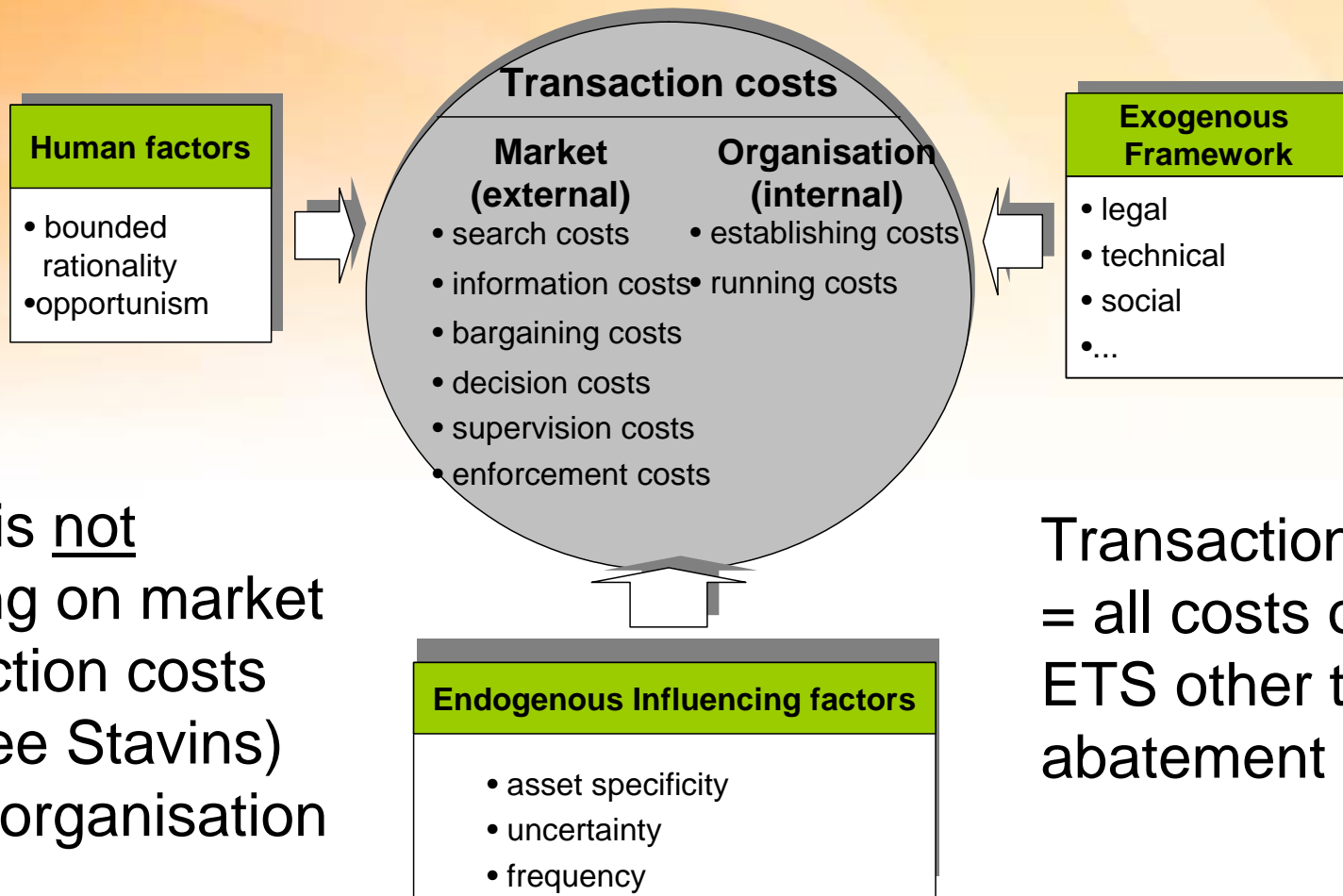
- Transaction costs in baseline & credit schemes
 - Theory & Empirical estimates (Clean Development Mechanism)
- Transaction costs in cap & trade schemes
 - Theory & Empirical estimates (EU Emissions trading scheme)
- Comparison of Transaction costs
- Conclusions



Design choices: Cap & trade vs. Baseline & credit

Baseline and credit	Cap and trade
Only emissions reductions compared to baseline or target are tradable	Allocated allowances are tradable
<i>Ex-post</i> Credits are generated after validation, verification and certification	<i>Ex-ante</i> Allowances are allocated to regulated installations
Wide participation in credit generation	Tradable surplus of allowances can only be created by regulated installations
Examples: Clean Development Mechanism NSW Greenhouse Gas Abatement Scheme Canadian Offset Scheme	Examples: EU Emissions trading Article 17 of Kyoto Protocol

Factors influencing transaction costs



Paper is not focusing on market transaction costs (e.g. see Stavins) but on organisation costs

Transaction costs = all costs of an ETS other than abatement cost



Examples of Transaction Costs

Transaction costs	Baseline and Credit (CDM)	Cap and trade (EU ETS)
Administration costs (government)		
One-time	Set-up costs (program and authority): development of legal framework, baseline methodologies	Set-up costs (program and authority) for e.g. development of legal framework, registry
Ongoing	Administration body to register projects e.g. Executive Board	Administration body to operate registry
Company related costs		
One-time	Project preparation and approval	Establishment of internal organisation: Monitoring, reporting process
Ongoing	Project emissions monitoring, verification	Monitoring, reporting of emissions and verification



Estimates of Transaction Costs: Baseline and Credit

Transaction costs: Estimates in Million A\$		
Administration costs (government)		
One-time	2.032 to 5.92	national scheme based on Canadian study
Ongoing	1.065 to 1.952	national scheme based on Canadian study
Project related costs (per project)		
One-time	0.215 to 0.878	CDM projects; initial preparation and decision costs including documentation highest
Ongoing	From 0.029	CDM projects, little experience so far

Registration costs of CDM projects are included under project-related costs, which finance Executive Board costs (Administration costs)



Baseline & credit:

- Negative correlation between project size and transaction costs -> economies of scale and a high proportion of fixed costs
- No correlation so far between project type and transaction costs
- High up-front costs to standardise baseline protocols and develop guidance documents (shift between one-time up-front and ongoing costs)
- Approval and negotiation costs depend on countries institutional framework (better in Latin America than Asia)
- Transaction costs development over time:
 - Declining: CDM pilot phase experience (AIJ)
 - Increasing: Baseline and credit schemes like CDM will have higher transaction costs with increasing abatement - because projects will get smaller and more complex - compared to cap and trade schemes.



Estimates for Transaction Costs: Cap and trade - Germany

Transaction costs: Estimates in million A\$

Administration costs (financed by private sector allocation fee)

One-time	12.022 (based on German Emissions Trading Authority information; labour costs highest)
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Ongoing	11.388 (based on German Emissions Trading Authority information; labour costs highest)
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Company related costs per installation/site

One-time	0.08 to 0.097 (establishing a system for monitoring, reporting emissions highest costs)
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Ongoing	0.056 (highest costs for monitoring, reporting and verification of emissions, trading costs have not been assessed)
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Comparing transaction costs

- What is the right measure to compare?
 - Per regulated company or CDM-project?
 - Per tCO₂e covered by the scheme?
 - Per tCO₂e of reduction compared to historic emissions?
 - Per tCO₂e of reduction compared to baseline projections?

- Which costs are taken into account?
 - Only administration costs – one-time or ongoing?
 - Only company costs – one-time or ongoing?
 - Administration and company costs – one-time or ongoing?

- Dynamic aspects?
 - How will transaction costs develop over time?
 - What kind of measures to reduce transaction costs will be introduced?

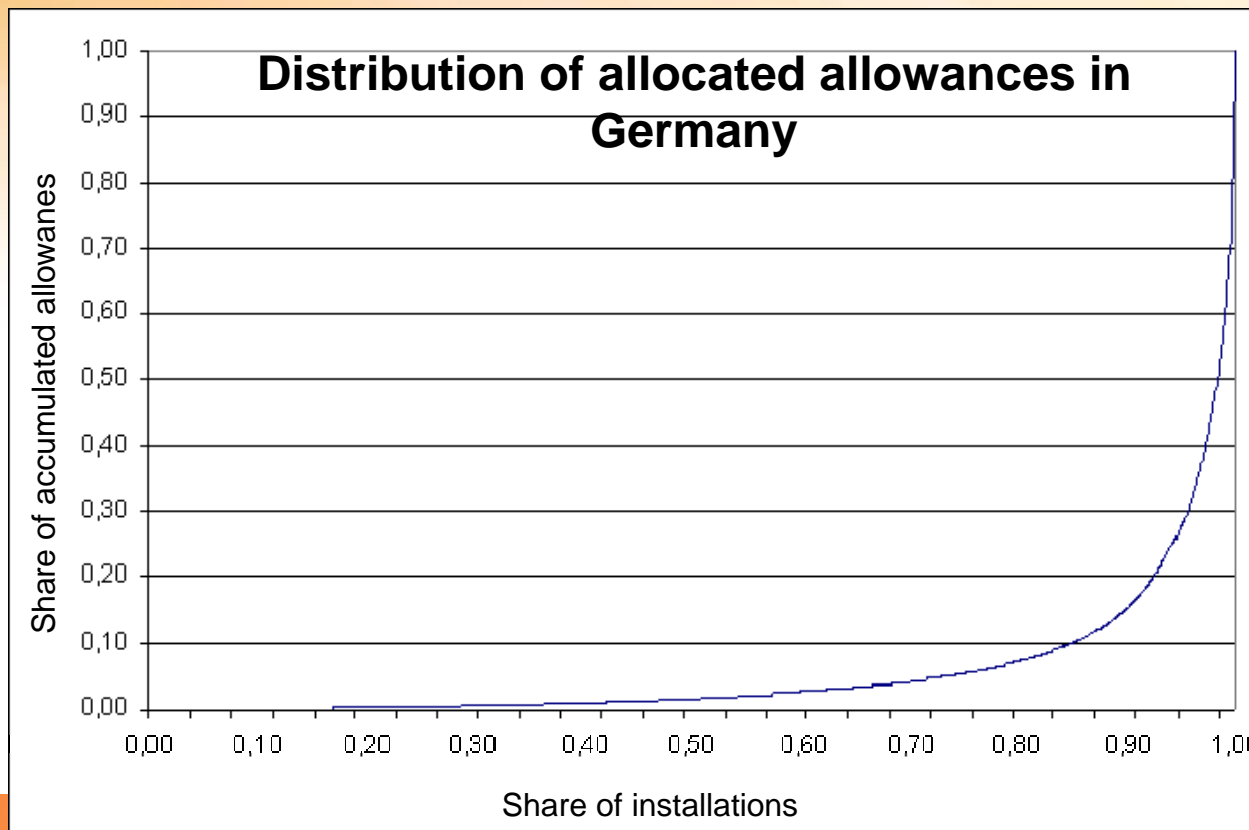


Comparing Transaction Costs

- Baseline and credit: CDM
 - Average costs for large projects: 0.48-1.13 A\$/t CO₂e reduced
 - Average costs for small projects: 0.65-1.77 A\$/t CO₂e reduced
- Cap and trade: EU ETS - Germany
 - Administration costs:
 - 6,159 A\$/installation,
 - 0.023 A\$/covered tCO₂,
 - 0.6 A\$/t CO₂ reduced compared to historic base year emissions
 - Company on-going transaction costs:
 - **5.2 t CO₂ reduced** compared to historic base year emissions
 - ?? t CO₂ reduced compared to baseline emissions -> no info in Germany
 - Total Transaction costs (admin. + company) per tonne reduced compared to historic emissions: 5.8 A\$
 - **Break-even: we need 12% reduction or costs to be more than halved!**

Proportion of covered installations

- Germany: (1) 85% of allowances are allocated to top 10% of installations (2) 50% of small installations receive only 1.6% of total allocation
- In other EU countries similar experiences (EU without Germany): (1) 33 % of installations are responsible for 0.7 % emissions (2) 55 % of installations for 2.6 %



- High transaction costs for industry and government!
- Little additional reductions from small companies expected, since low compliance costs (buying is cheaper than mitigating)



Measures to reduce Transaction Costs

- **Baseline & credit:**
 - bundling / pooling of projects,
 - standardisation of documentation and baseline requirements,
 - frequency of monitoring and verification,
 - length of crediting period,
 - capacity building to strengthen institutional framework.
- **Cap & trade:**
 - introduce a "de minimis rule" and include small companies through opt-in rule (cap & trade) or through "domestic projects" (baseline & credit) -> incentive by e.g. tax exemptions
 - Simplification of allocation rules (e.g. auctioning) to reduce legal and strategic costs upfront,
 - standardisation and simplification of monitoring requirements



Conclusions and outlook

- Cap & trade schemes will not always have lower transaction costs per ton of CO₂e reduced than baseline & credit schemes
- Transaction costs per reduced tonne depend on stringency of target
- Long run cap & trade to be favored since less costs if stringent targets are to be reached
- Comparing transaction costs with efficiency gains from trading -> Transaction costs will only form a fractional share of potential trading gains according to models
- Transaction Costs are only one criteria to assess different schemes: Baseline and credit schemes have other disadvantages e.g. no cap, difficulties in baseline setting/additionality, leakage, and perverse incentives from subsidising reductions may increase emissions
- Ongoing research:
 - Survey on transaction costs together with EuPDRResearch
 - Where to set the "efficient threshold" for cap and trade schemes



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