



Centre for Energy and
Environmental Markets

UNSW
THE UNIVERSITY OF NEW SOUTH WALES
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Emissions trading to combat climate change:

The impact of scheme design on transaction costs

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Overview

- Design options
- Factors influencing transaction costs
- 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)
 - Small emitting companies in Germany
- Conclusions

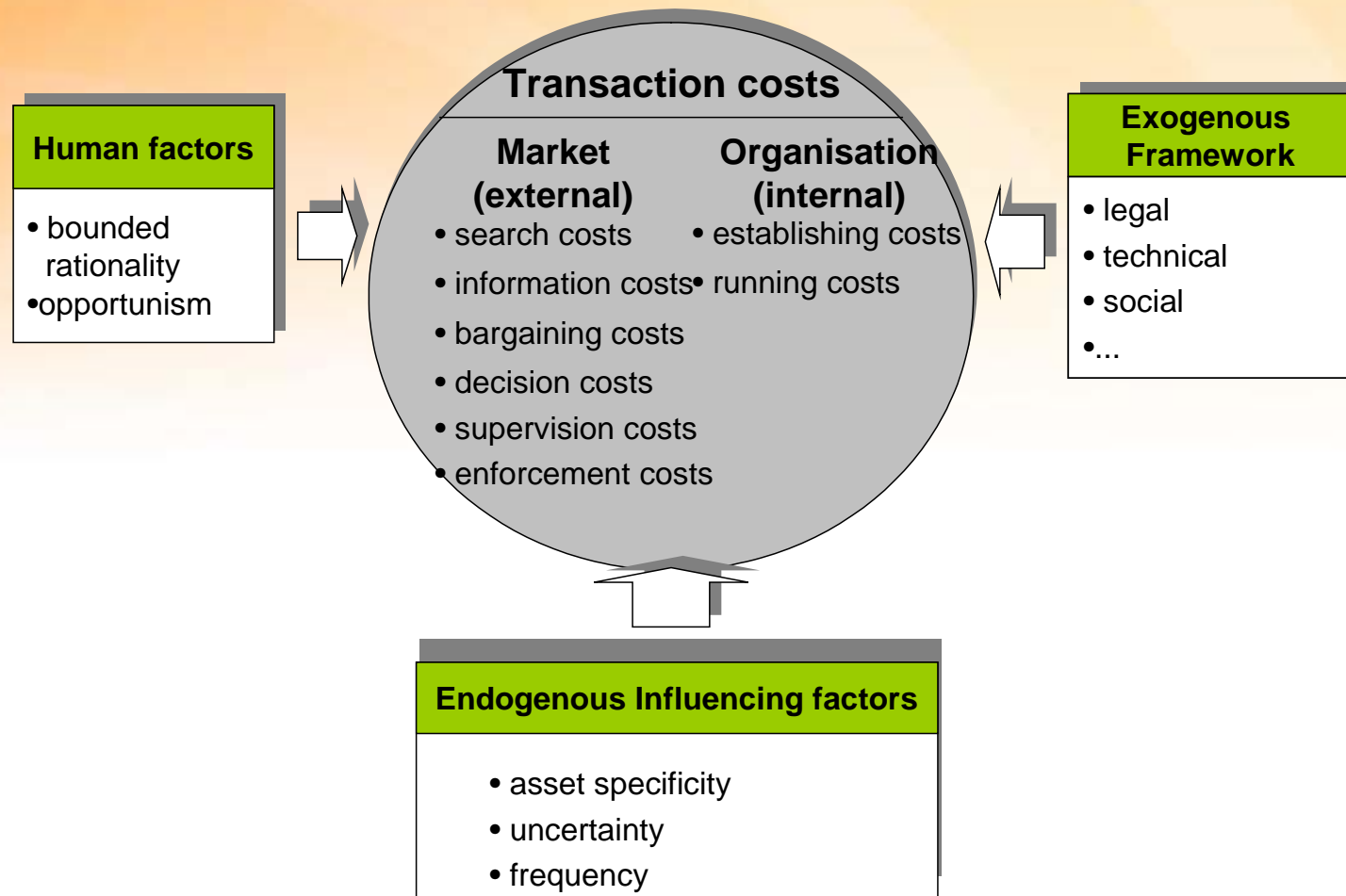


Design choices: Cap & trade vs. Baseline & credit

Baseline and credit	Cap and trade
Only emissions reduction 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

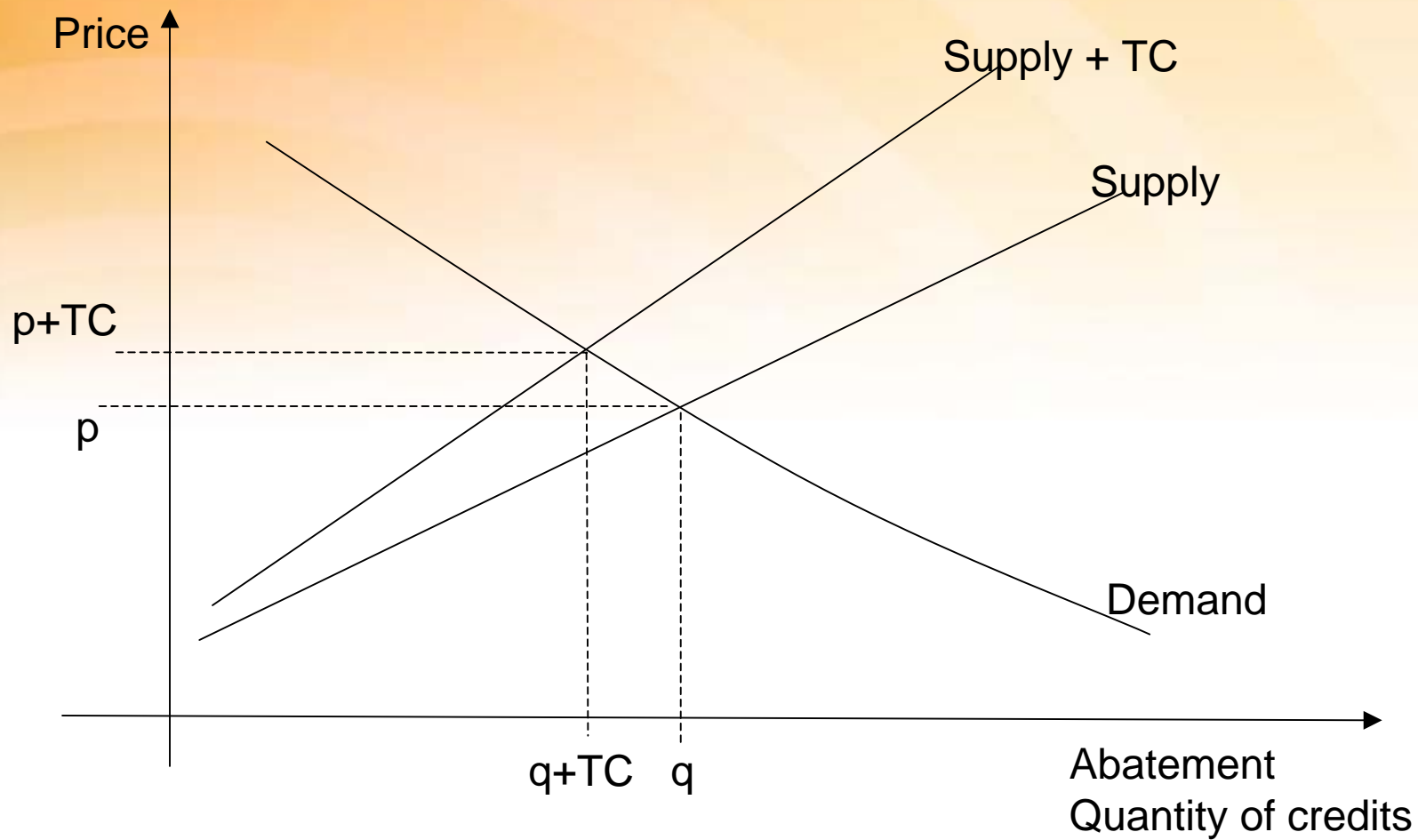


Factors influencing transaction costs



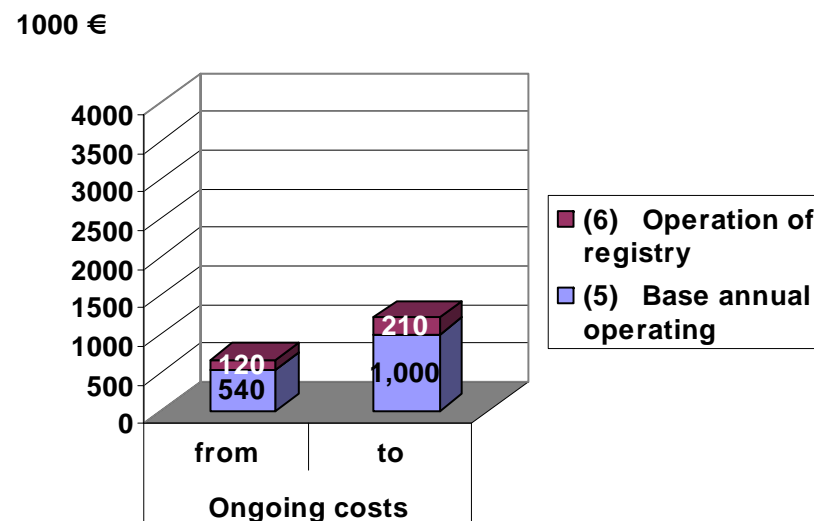
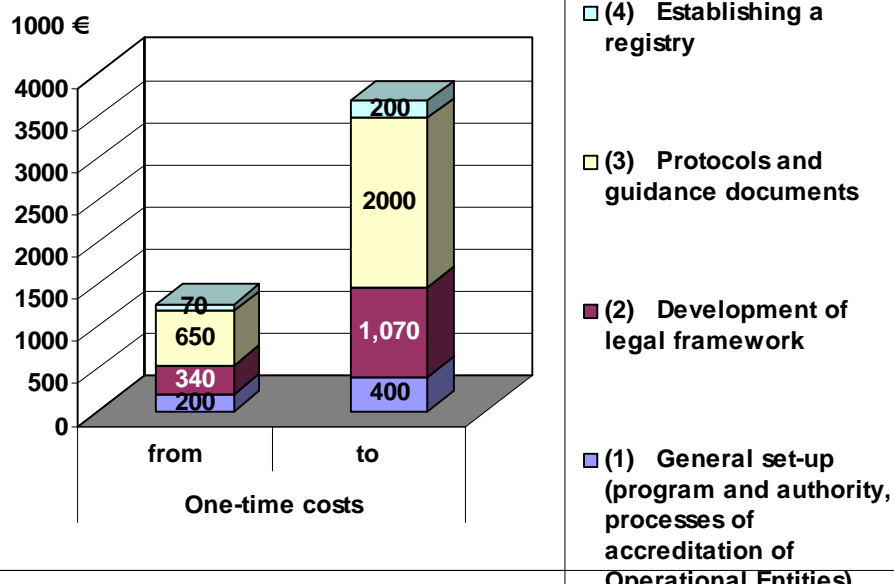


Theory: Baseline & credit and transaction costs





Empirical estimates (Canada): Administration costs



One-time costs

From: 1,260 Mio. €/ a

To: 3,670 Mio. €/ a

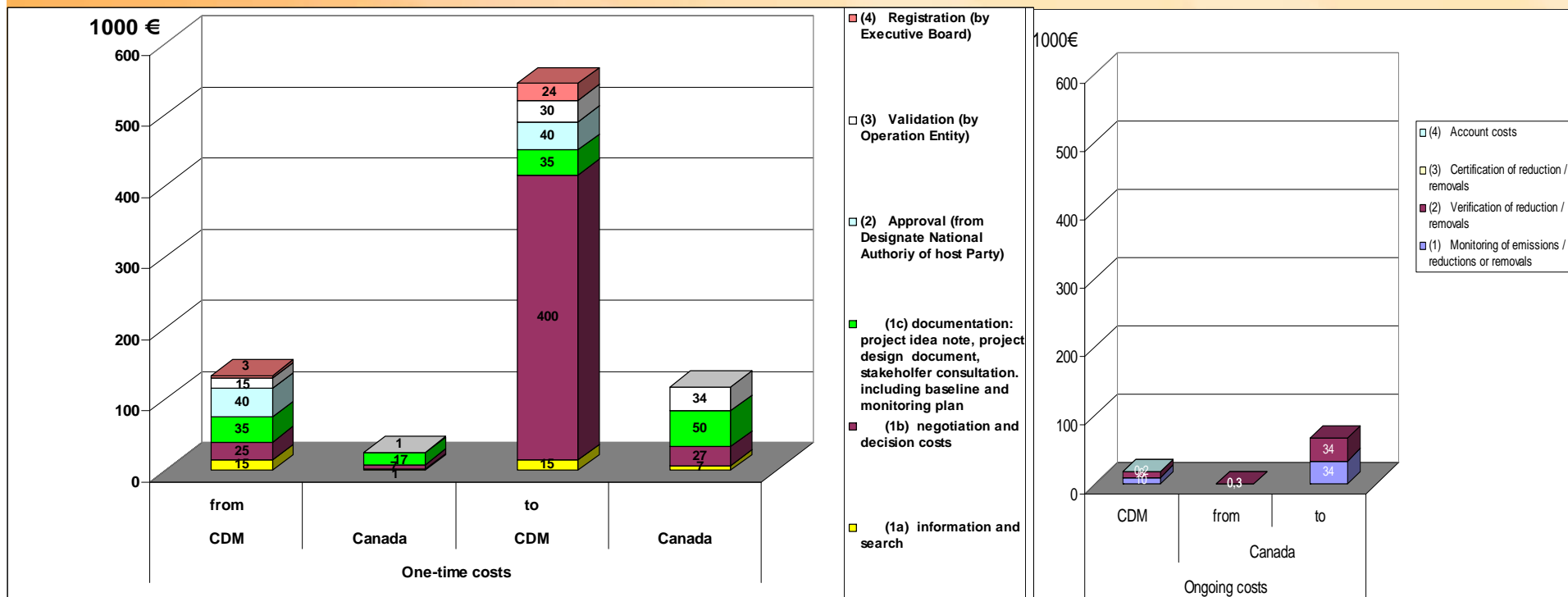
Ongoing costs

From: 0.660 Mio. €/ a

To: 1,210 Mio. €/ a



Empirical Estimates: Project related costs



One-time costs

CDM: 133 – 544 k€

National: 26 – 118 k€

Ongoing costs (per turn/year)

CDM: 18.2 k€

National: 0.6 - 68 k€

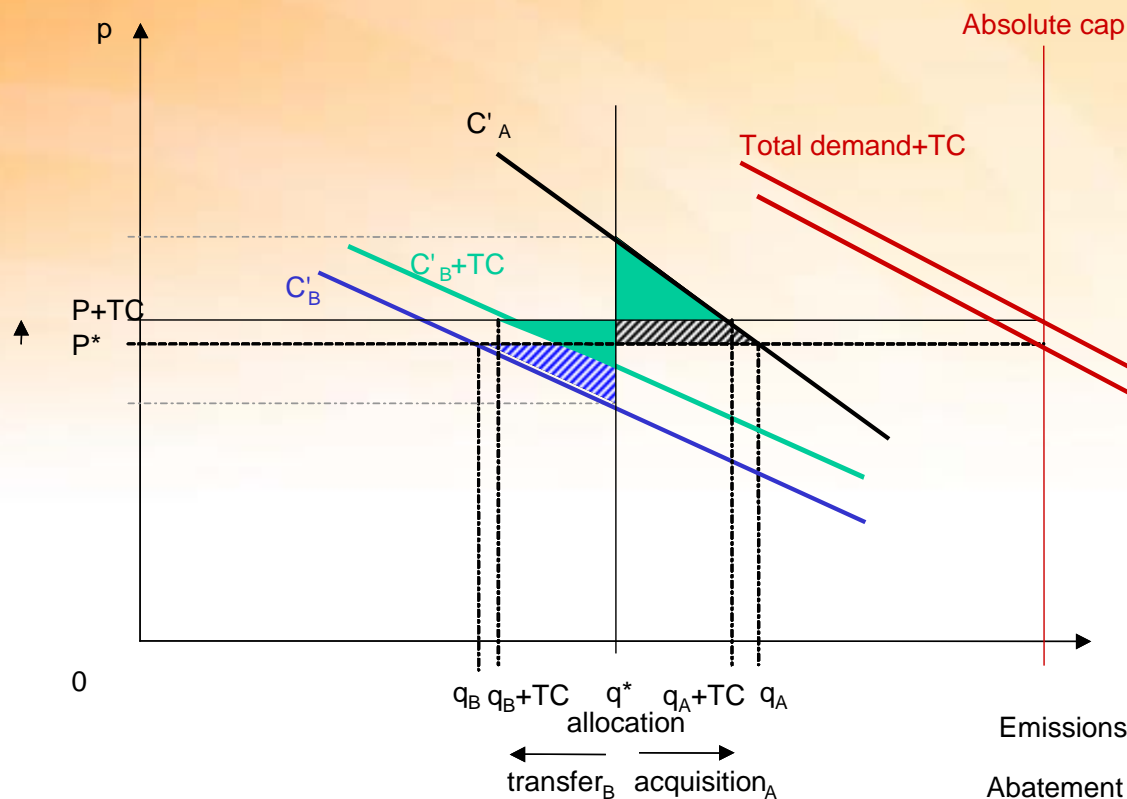


Baseline & credit: CDM and TC

- Negative correlation between project size and transaction costs -> economies of scale and high proportion of fixed costs
- Average costs for large projects: 0.3-0.7 €/t CO₂e
- Average costs for small projects: 0.4-1.1 €/t CO₂e
- Administration costs depend on countries institutional framework (better in Latin America than Asia)
- Transaction costs decline over time
-> CDM pilot phase experience (AIJ)



Theory: Cap & trade and market transaction costs



Constant marginal TC
Seller bears TC

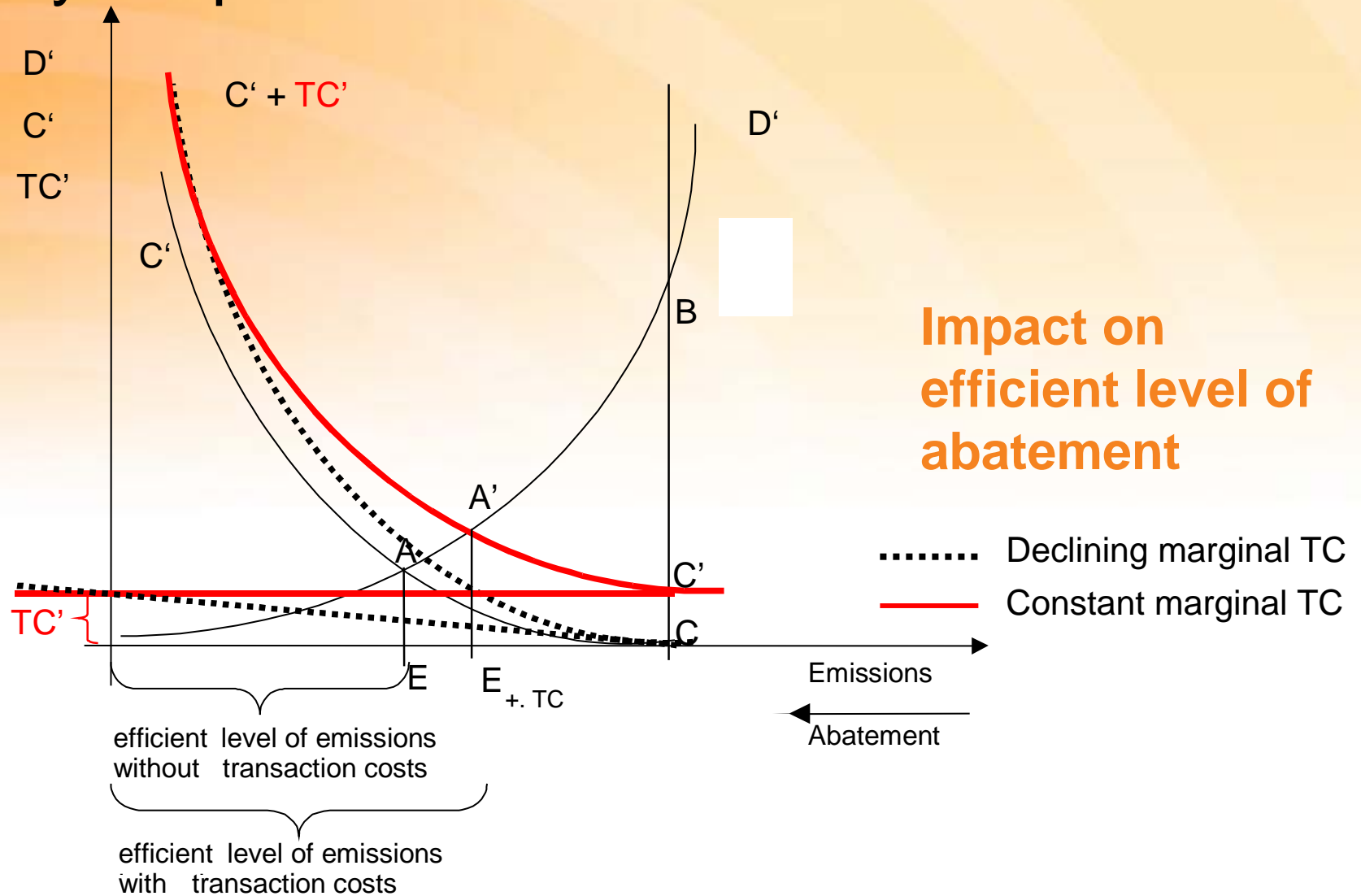
Constant marginal TC
vs. declining marginal
TC: initial allocation is
more important to be
close to equilibrium
without transaction
costs

Impact on trading gains:

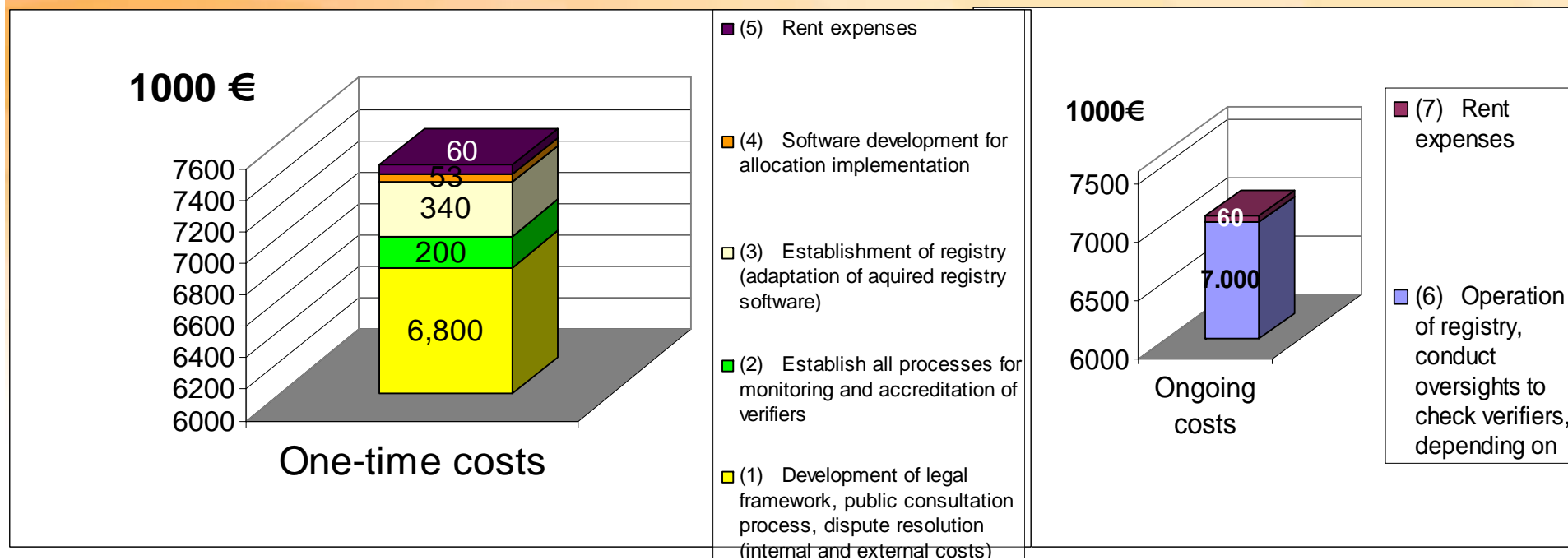




Theory: Cap & trade and overall transaction costs



Empirical estimates (Germany): Administr. Costs



One-time costs: 7,453 Mio. € / a

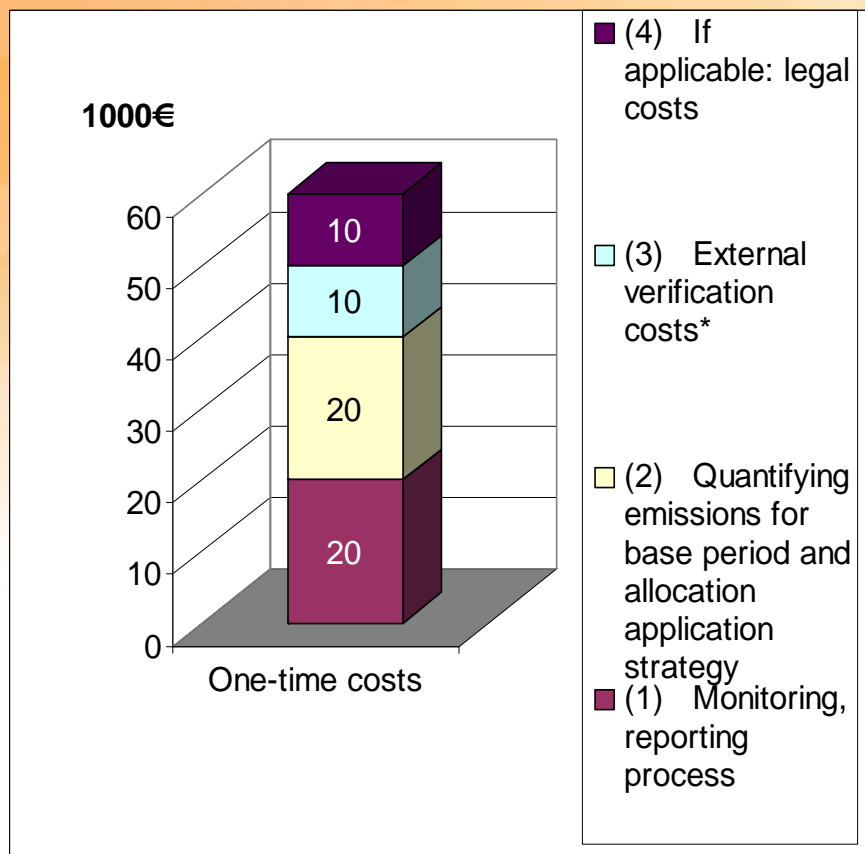
Ongoing costs: 7,060 Mio. € / a

Average TC of: 4,000 € / installation

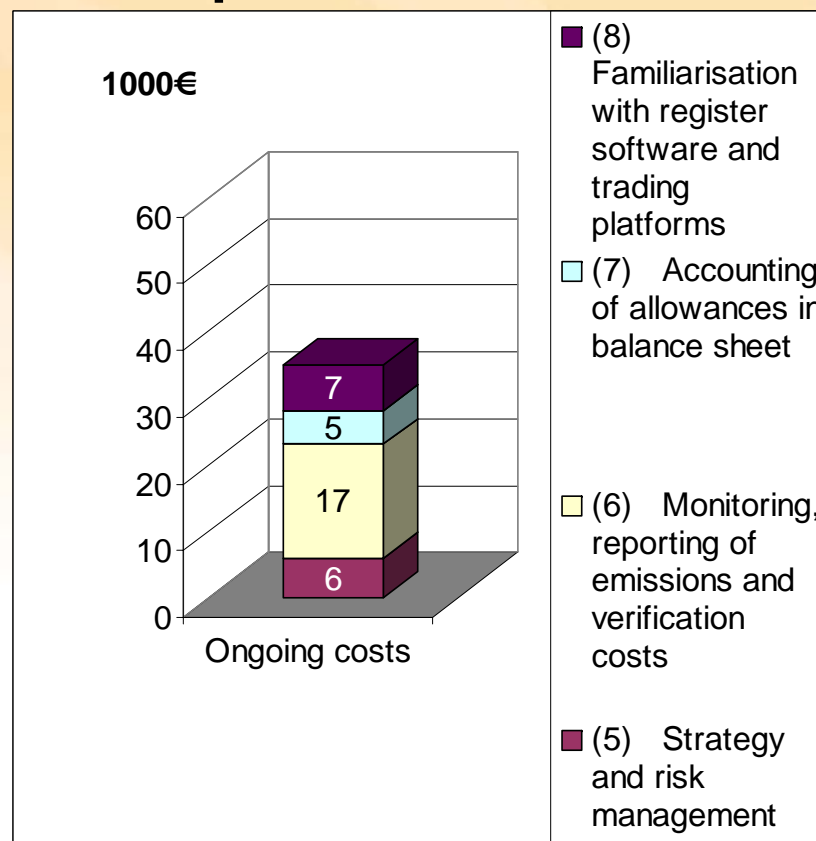
1.4 Cent / covered t CO₂e

35 Cent / reduced t CO₂e

Transaction costs for companies



One-time costs: 50-60 k€ / installation or company for average complex installation depending on legal costs

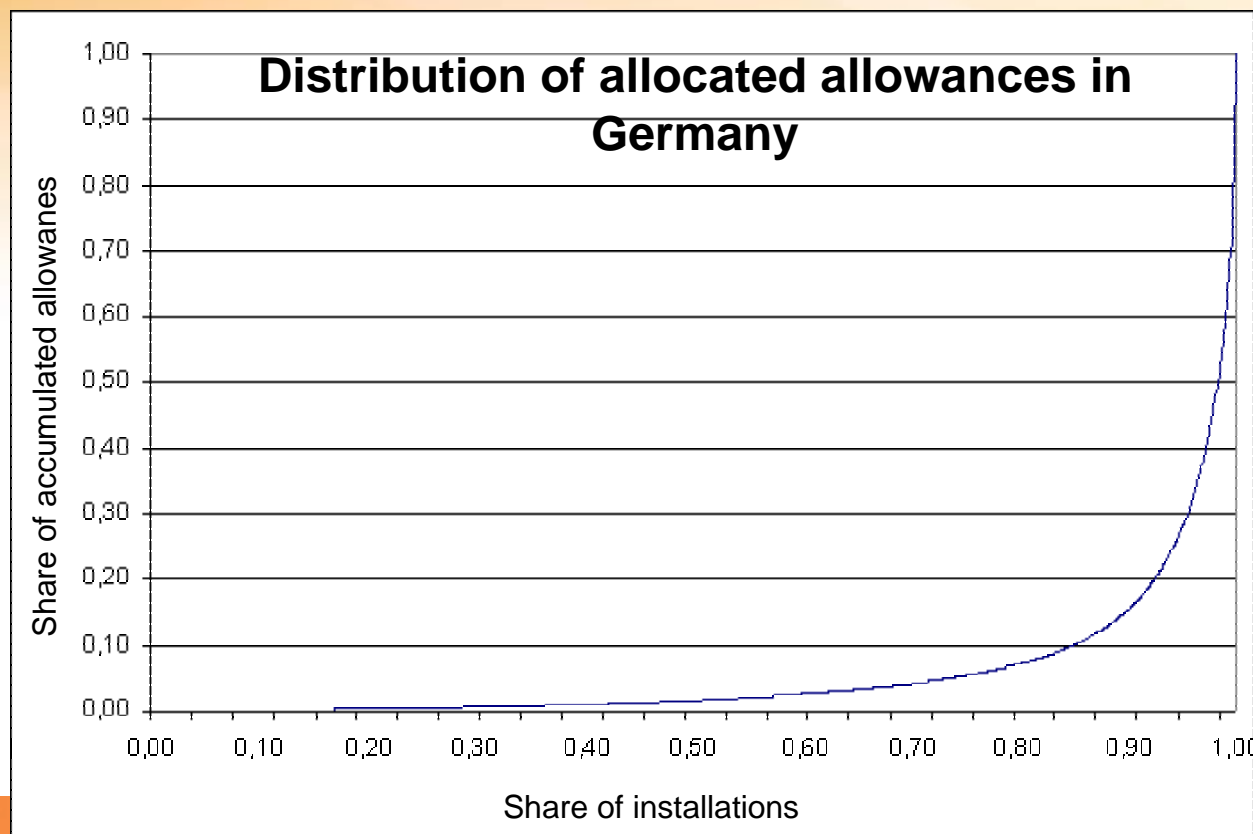


Ongoing costs: 35 k€ / a per installation (company) no sanctions assumed



Proportion of covered installations

- Germany: (1) 85% of allowances are allocated to top 10% of installations (2) 50% of small installations only receive 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)
- "De minimis rule" will reduce transaction costs with little impact on efficiency



Conclusions

- Cap & trade schemes will not always bear lower transaction costs per ton of CO₂e reduced than baseline & credit schemes (35 Cent vs. 1.1 Cent)
- Transaction costs per reduced ton depend on stringency of target
- Long run cap & trade to be favored since less costs if stringent targets are to be reached
- To reduce overall 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)
 - simple rules for allocation (e.g. auctioning) to reduce legal and strategic costs upfront, highly standardised monitoring requirements
- Comparing transaction costs with efficiency gains from trading
-> Transaction costs will only form a fractional share of trading gains



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