

Sectoral crediting mechanism design

Results of a study commissioned by the
Global Wind Energy Council (GWEC)



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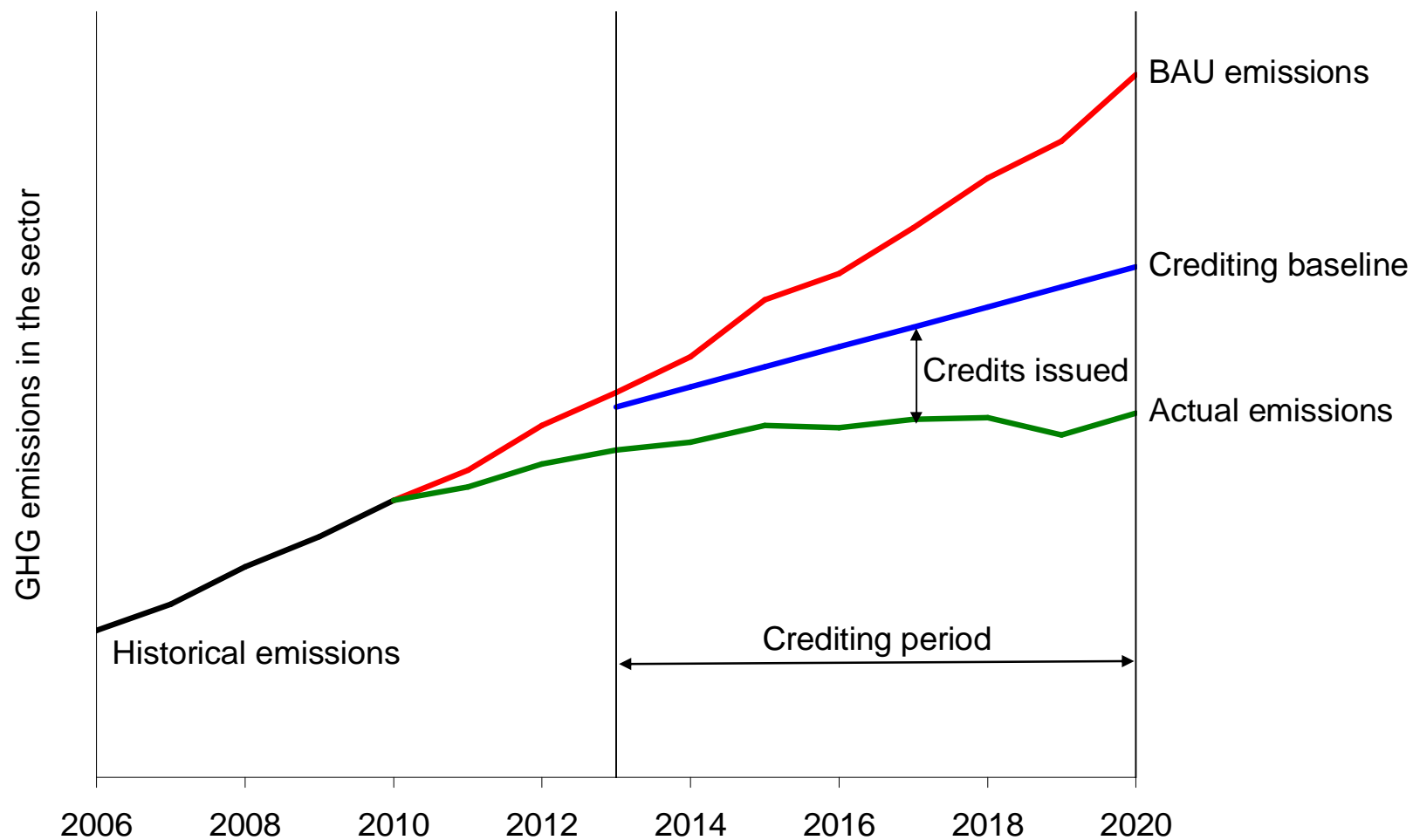
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Outline

- How does a sectoral crediting mechanism work?
- How is a sector defined?
- What sectors are best suited?
- Arrangements for governing the SCM
- Key challenges in defining a baseline
- Supply and demand -
the role of a SCM in the global carbon market
- Conclusions

How does a sectoral crediting mechanism work?

How does a SCM work?



Key differences between SCM and CDM

	SCM	CDM
Which emission sources / entities are covered?	All in the sector	One entity or source / several (programmatic)
Who receives the credits?	Government	Private entities
How is the baseline established?	Analysis of trends & projections in the sectors	Historical emissions/ economically / benchmark

Key features of a SCM

- **Voluntary** participation - no sanctions if the emissions are above the crediting baseline
- **Strong financial incentives** for host countries through the carbon market
- Crediting baseline can be set below BAU emissions
=> **net mitigation contribution** from the mechanism
- Allows **crediting** emission reductions from **policies** (large potential!)
- Allows **up-scaling** the post-2012 carbon market
- **Avoids** the hypothetical assessment of the **additionality** of individual projects

Key challenges of a SCM

- Uncertainty in estimating future BAU emissions and the mitigation potential => difficult choice of crediting baseline
 - Data availability and reliability
 - Definition of the sector
 - upstream, downstream emissions
 - avoiding double counting
 - avoiding carbon leakage
 - Creating incentives for the private sector
 - National and international institutional arrangements
 - Transition from the current CDM
 - International competition / carbon leakage concerns
- => Many methodological challenges, many design options to be negotiated**

How is a sector defined?

Coverage of a sector

- **Geographical**
 - Host country
 - Region
 - Group of countries
- **Criteria**
 - Avoid carbon leakage: extended scope
 - Monitoring: data availability
 - Technical configuration: regional differences in energy sources, age of installations
 - Administration: weak regional structures?
- **Usually most appropriate: host country**

Coverage of entities

- **As wide as possible**
 - Facilitated determination of robust baselines
 - Level out exceptional emissions profiles
 - Improve economic efficiency
- **Avoid unintended consequences**
 - Clear definition of installation or activity
 - Sectors according to national statistics or CRF
 - Sub-sectors such as refrigeration, stoves, etc.
 - Avoid overlap or double counting
 - De-minimis rule to limit transaction costs
 - Pooling of smaller installations on one site
 - Cover all products (e.g. co-generation)

What sectors are best suited?

Alternatives to the SCM

- **Project-based CDM**
 - Beyond offsetting
- **Programmatic CDM**
 - Beyond offsetting
- **Sectoral binding targets**
 - Company-based ETS
- **Policies and measures**
 - Outside the carbon market
 - Financially and technically supported

Assessment criteria

- **Carbon leakage (CL)**
 - Partial carbon markets for industrial sources
 - Products which can be stored and transported
 - SCM
 - Standards or a tax could reduce CL
 - GHG credits could increase CL
(credit price > mitigation costs)
- **Effectiveness of carbon market**
 - Price signal not strong enough to overcome barriers
 - Buildings: stringent codes
 - Electricity demand: efficient appliances
 - Transport: policies towards climate friendly modes

Assessment criteria

- **Technological development**
 - Large technological differences within a sector
 - Age of installations
 - Mitigation costs
 - Shift of production between installations
 - Sectoral approach economically efficient
- **Monitoring and establishing baselines**
 - Monitoring difficulties
 - Sector level: chemical sector due to many products
 - Project level: transport sector due to many actors
 - Uncertainty of GHG reductions: REDD

Suitability of sectors

Sector	Preferred instruments	Rationale
Power generation	SCM , ST	Point sources, sector with high priority for many developing countries
Iron & steel	ST	Carbon leakage, point sources
Cement	ST	Point sources, advanced sector in many developing countries
HFC-23, N ₂ O from nitric or adipic acid production	ST, CDM	Carbon leakage, point sources, few installations
Electricity consumption	SCM , PAMs	Policies and measures key for demand side measures, project based approach not efficient
Buildings	SCM , PAMs	Policies and measures key to reduce emissions, project-based approach not efficient
Road transportation	SCM , PAMs	Policies and measures key to reduce emissions, project-based approach not efficient and methodologically difficult, dispersed emission sources
Waste	CDM	Point sources, carbon price signal important (CH ₄)
LULUCF, Agriculture	PAMs	Methodological difficulties in establishing baselines and monitoring GHGs, policies and measures are key to reduce emissions, project-based approach not efficient

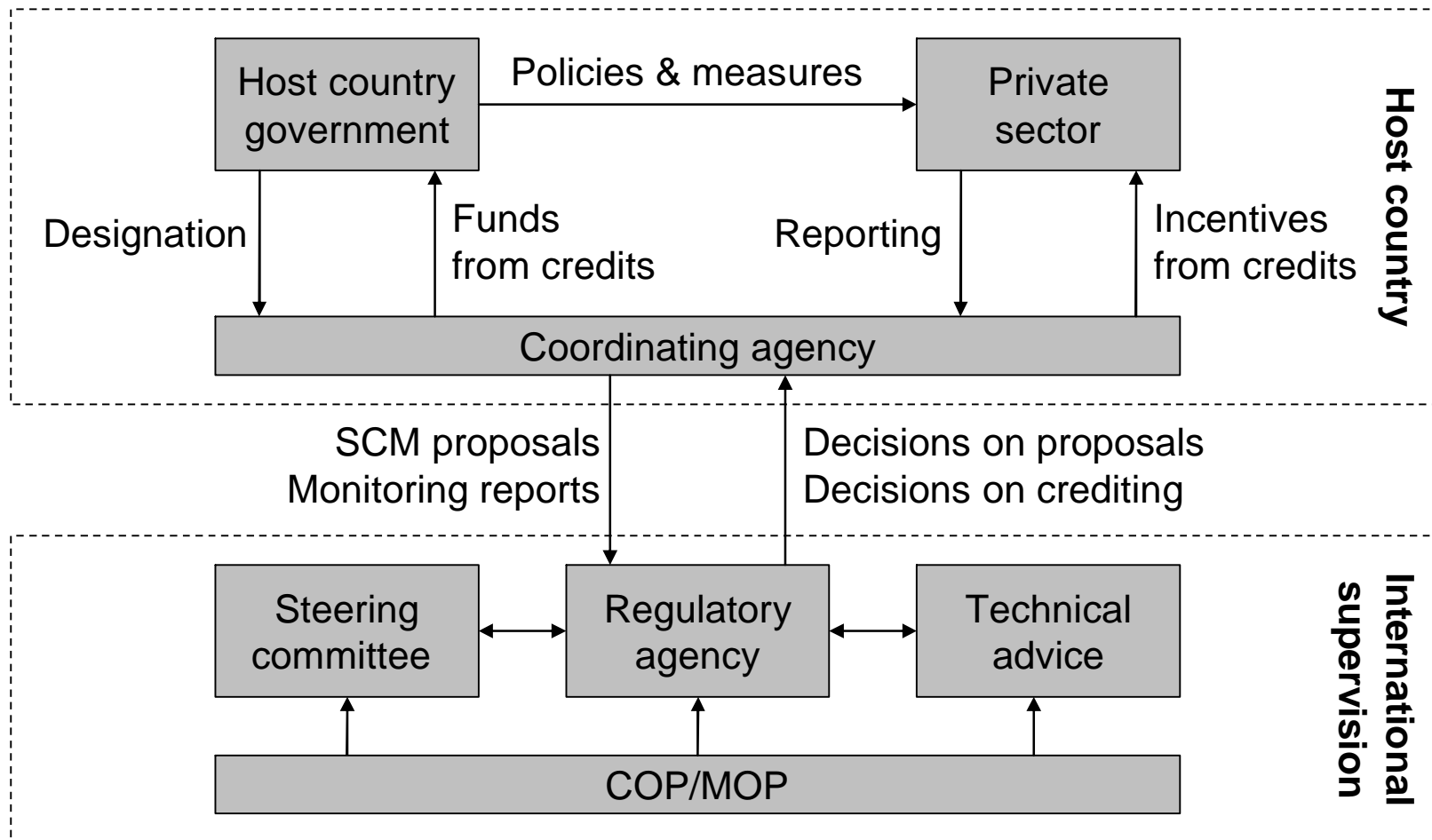
SCM = Sectoral crediting mechanism, ST = sectoral targets potentially with company-based emissions trading,
 PAMs = policies and measures outside the carbon market

Suitability of sectors

- Large point sources more suitable for sectoral targets with company-based emissions trading
- Large number of emissions sources
- Demand side
- Suitability could differ between countries
- Strong governance capacities required
Otherwise project-based more appropriate
- Learning by doing will provide deeper insights in suitability

Arrangements for governing the SCM

Possible government arrangements



A national coordinating agency

- **Responsibilities**
 - Development of SCM proposal(s)
 - Collection of data needed
 - Coordination of reduction measures
 - MRV of emission reductions
- **Early establishment needed**
 - New or existing public authority
 - Private sector entity
 - Research institute
- **National steering committee**
 - Business associations
 - National stakeholders
 - NGOs

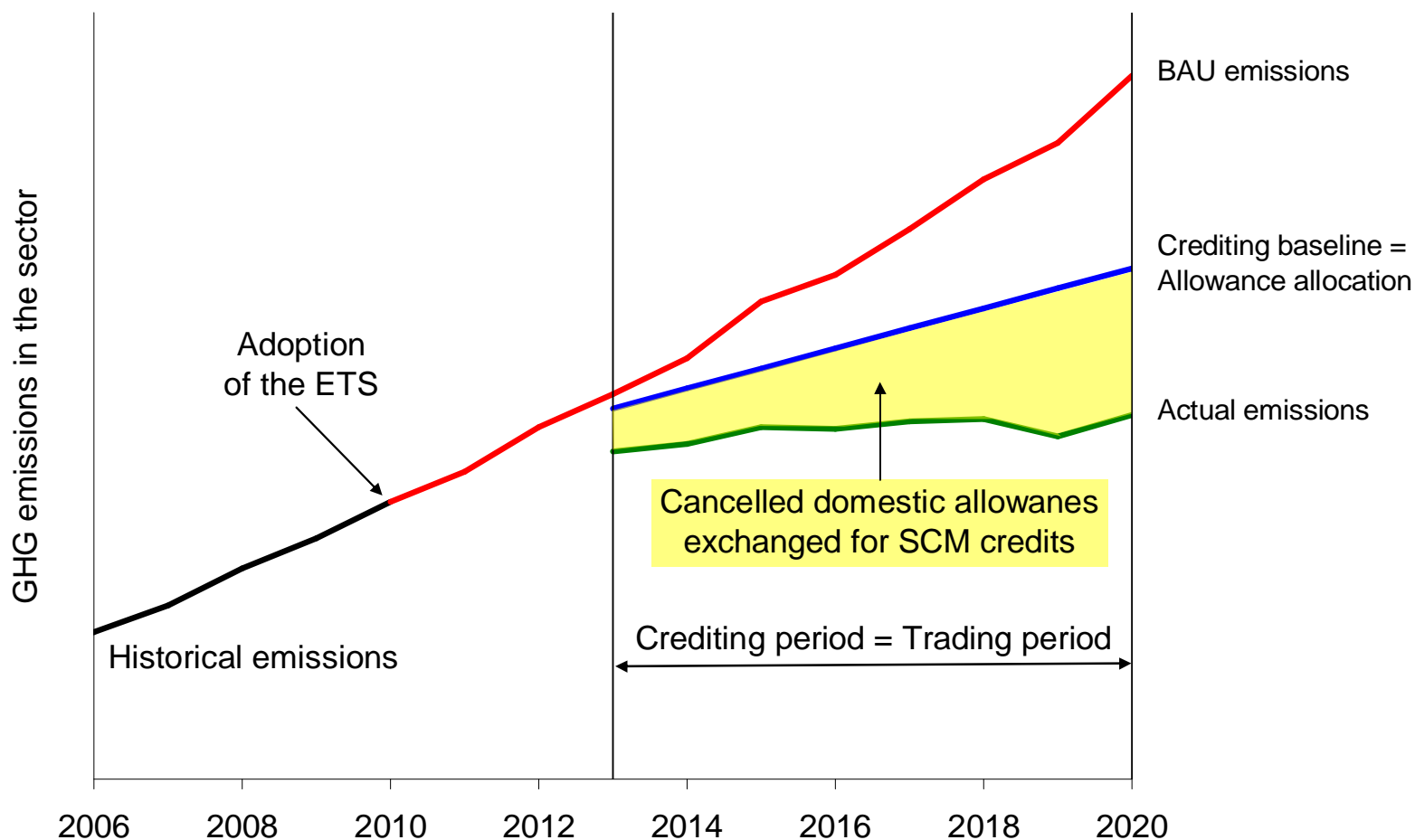
Development of SCM proposals

- Collection of sector specific data
- Identification of reduction potential
- Mitigation cost estimates
- Planning of policies and measures
- Develop a proposal document based on an internationally agreed template (SPD)
- Approval by national government
- Submission to international body

Incentives for the private sector

- **Policies and measures**
 - Most suitable policy instrument can be used
 - Low transaction costs
 - Banning of incandescent light bulbs
 - Efficiency standards for refrigerators
 - Credit revenues to refinance feed in tariffs
- **Distribution of credits**
 - Uncertainty since issuance depends on other entities performance
 - Credits would only be issues ex-post
- **SCM could be combined with an domestic ETS**

SCM implemented through domestic ETS



SCM implemented through domestic ETS

- **Direct link of SCM with global carbon markets**
- **Incentives: allowance price < credit price**
- **Challenge: credits issued ex-post**
 - Private entities provide futures on credits
 - Host country governments “borrow” internationally recognised units
 - Internalisation: risk premium

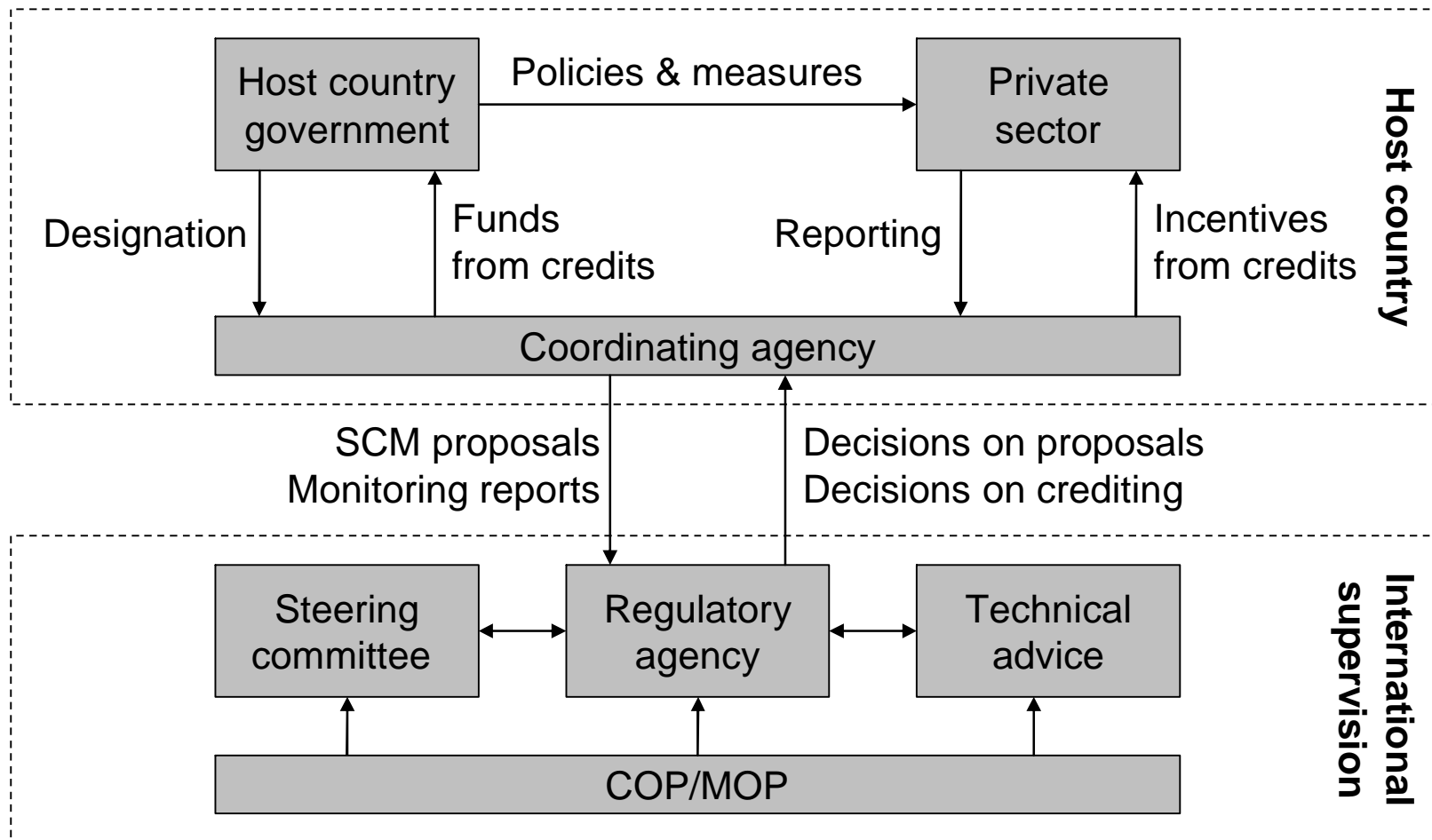
Conflicting interests of host country and global community

- **Regulatory body under the guidance of the COP/MOP**
 - Assessment of proposals
 - Issuance of credits
- **Lessons learned from the CDM**
 - Sufficient financial resources
 - Economic and technical knowledge needed
 - Institutional structure
 - Key policy decisions: political steering committee
 - Technical work: full time professionals
 - Immunities: PSC members

Approval of proposals

- Internationally agreed template
- Thorough technical assessment
- Consideration of stakeholder comments
- Due process
- Appeals procedures
- Clear timelines

Possible government arrangements

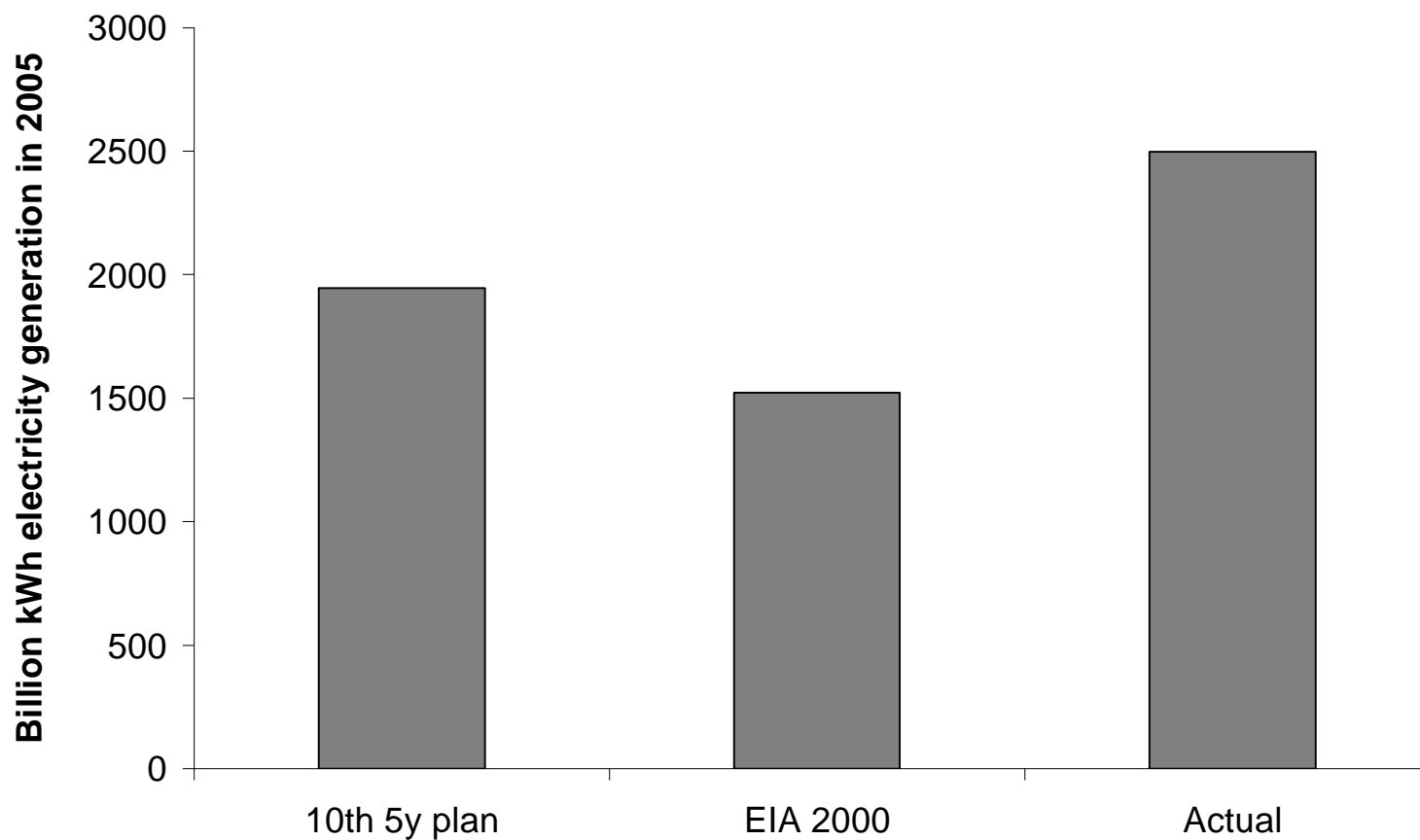


Key challenges in defining a baseline

The challenge

- **Future GHG emissions are driven by many factors**
 - Economic development, population growth, international fuel prices, technological development, etc
- ⇒ **Any emission projection has considerable uncertainty**
 - Overestimation: Credits are issued for no reductions
 - Underestimation: No credits are issued despite mitigation
- **How to factor out the signal (measures to reduce GHG emissions) from the noise (exogenous factors)?**
- **How to establish a credible baseline in the absence of reliable data?**

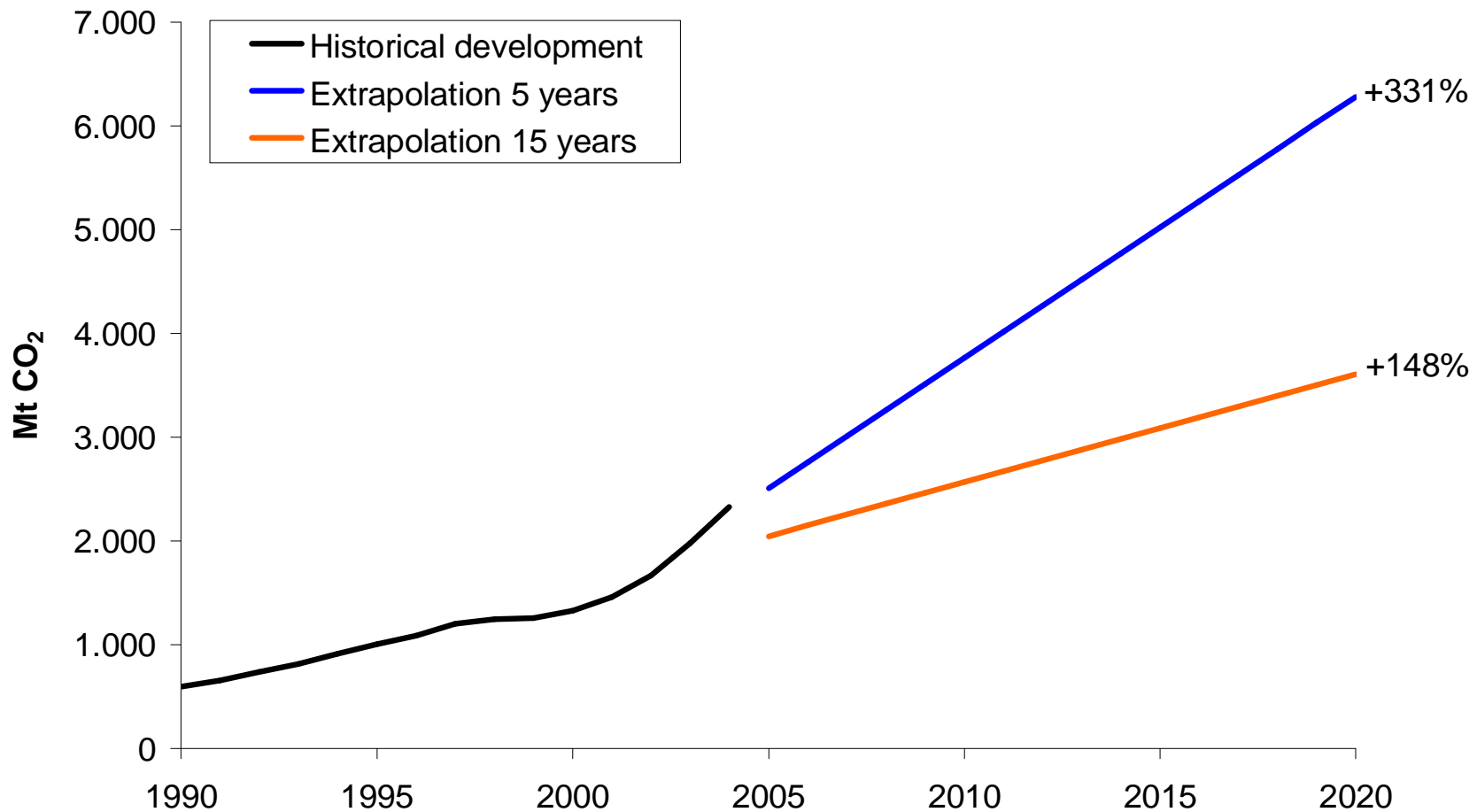
Actual versus projected electricity generation in China



Source: OECD / Jane Ellis

Extrapolation of historical data? (1)

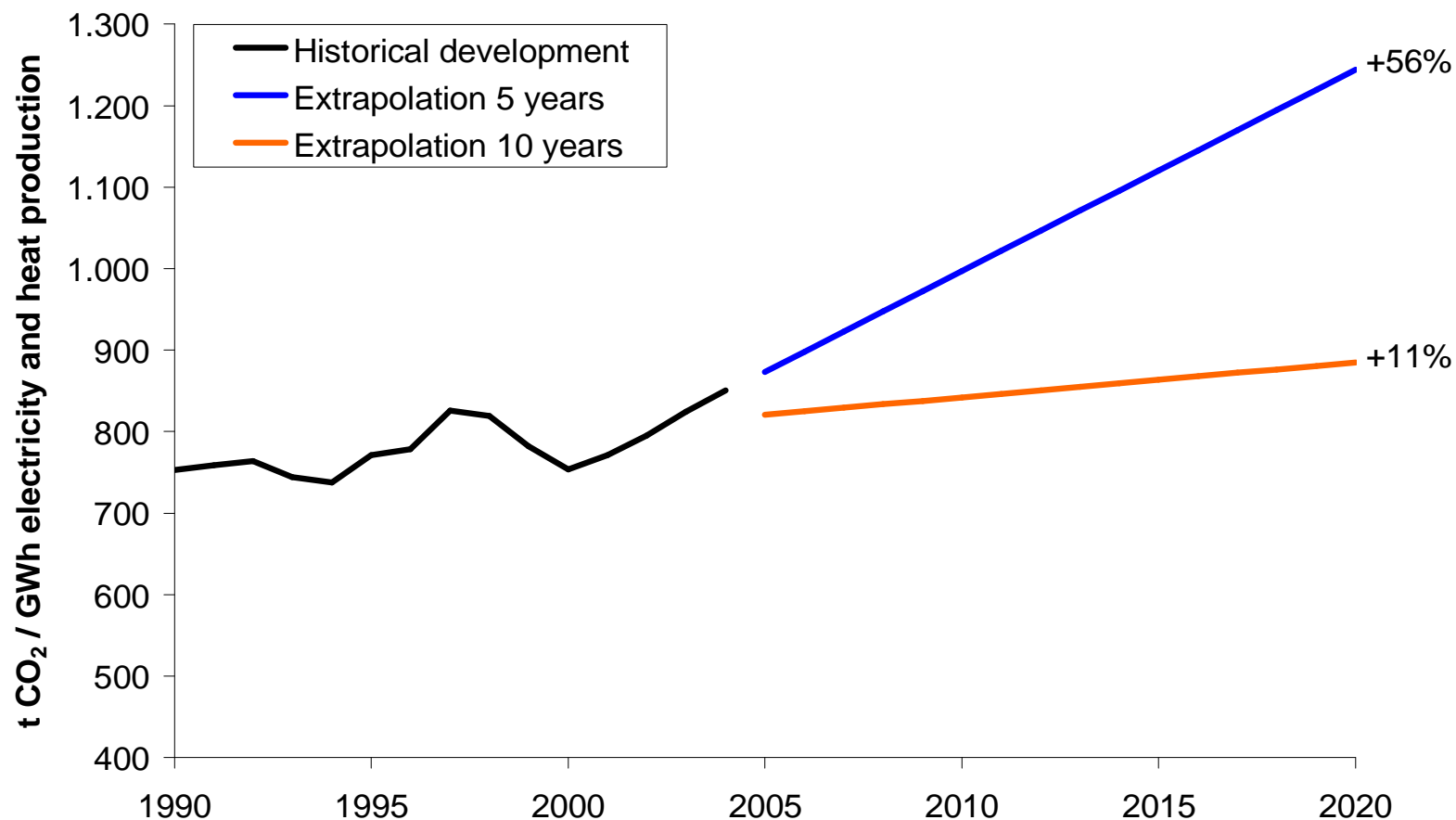
Absolute GHG emissions from electricity and heat generation in China



Data source: IEA

Extrapolation of historical data? (2)

GHG emissions per electricity and heat generation in China



Data source: IEA

Types of sectoral crediting baselines

- **Absolute emissions baselines**
 - Baseline is determined ex ante in t CO₂e in year x
- **Indexed baselines**
 - Ex ante: definition of indexes + algorithm to calculate baseline from indexes (e.g. t CO₂ / MWh electricity, t CO₂ / GDP)
 - Ex post: monitoring of indexes + calculation of absolute baseline emission level
- **Technology penetration baselines**
 - Ex ante: definition of baseline technology penetration level (e.g. MW, MWh or % of renewable power)
 - Ex post: calculation of achieved emission reductions with EF expressing difference BAU technology ↔ targeted technology

Pros and cons of different baseline types

	Advantages	Disadvantages
Absolute emission baselines	<ul style="list-style-type: none"> • Allows crediting of all measures to reduce GHG emissions • Easier in sectors with diverse products / complex industries • Simplicity 	<ul style="list-style-type: none"> • Higher uncertainty in establishing the baseline • May be perceived as more stringent be less acceptable
Indexed baselines	<ul style="list-style-type: none"> • Lower uncertainty in establishing the baseline (better able to factor out the signal from the noise) • May be politically more acceptable than absolute emission targets 	<ul style="list-style-type: none"> • More difficult to apply in sectors with diverse products and services • More complex to implement • Some measures may be excluded from crediting
Technology penetration baselines	<ul style="list-style-type: none"> • Focus on technology may be interesting for countries interested in TT 	<ul style="list-style-type: none"> • Focus and scope rather narrow • Considerable uncertainty in establishing the baseline

What should be the basis for baselines?

1. Deviation from BAU

- X% below BAU emissions projection

2. Mitigation potential / costs

- Level of “no-regret potential”

3. Emissions intensity of reference technology

4. Emissions benchmark based on historical data

- Top 20% performers in the past five years
- Operating margin / build margin of electricity grid

5. Technology penetration scenario

- X% renewables + Y% supercritical coal + ...

6. Policy objectives scenario

- Improvement of energy efficiency by X%
- Stabilization of GHG emission by year Y

⇒ **Combination of approaches?**

Key conclusions for establishing baselines

- **Ensure that baselines are below BAU trends**
 - Balancing political negotiation ⇔ methodological approaches
 - Apply principle of conservativeness
 - Use the lower baseline among various approaches?
- **Considerable data (consistency) problems even in simple sectors, such as power sector**
 - Data collection for a future reference year (e.g. 2012)
 - Apply same data collection methodology for reference year and years of the crediting period
 - Exclude sectors with considerable data problems?
- **Considerable technical and policy efforts needed to make a sectoral mechanism work**

Supply and demand – the role of a SCM in the global carbon market

Potential post-2012 carbon market instruments

Demand:

- Targets of industrialised countries
- Sectoral targets of developing countries?

about 0,5 – 1,7 Gt

(Source: UNFCCC)

Supply:

- CDM (beyond offsetting)
- Sektoral Crediting ?
- Crediting NAMAs ?
- Joint Implementation
- AAUs / Green Investment Schemes
- REDD???

about 7 Gt

(Source: UNFCCC)

⇒ Supply could easily exceed demand

⇒ Low prices / few incentives from carbon market

How to regulate the carbon market? (1)

- **Problem: credit supply is uncertain – even after agreement on a post-2012 climate regime**
 - How many countries / sectors will participate in sectoral CDM?
 - How ambitious will crediting baseline be set?
 - How successful will host countries be in lowering emissions below the crediting baseline?
 - How will CDM / programmatic CDM develop?
- ⇒ **Carbon market regulation needs to respond in a flexible manner to actual developments**

How to regulate the carbon market? (2)

1. **Ambitious targets by industrialised countries**
 - Regular reviews
 - Automatic review triggered by certain carbon market prices
2. **Caps on the import of credits by industrialised countries**
 - fixed caps (implemented in EU ETS)
 - caps linked to carbon market prices (implemented in RGGI)
3. **Caps on the issuance of credits**
 - globally or per country (e.g. X% of national emissions)
4. **Carbon bank**
 - can purchases and cancel credits
 - borrows / sells AAUs
 - requires money!
5. **Minimum prices for allowance auctioning**
 - cancellation of allowances not auctioned

=> A portfolio of instruments may be needed

Conclusions

Overall conclusions

- **A SCM could unlock emission reduction potential in sectors where government action is key**
- **Key issues to ensure environmental integrity are**
 - Avoiding baseline inflation
 - Clear definition of sectors and reliable data
 - Strong role of host country government responsible for setting incentives for entities in the sector
 - A strong and independent regulatory body

Thank you for your attention!



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