



International Review of Trading Schemes for Energy Saving, Carbon Reduction and Renewable Energy

World Bank

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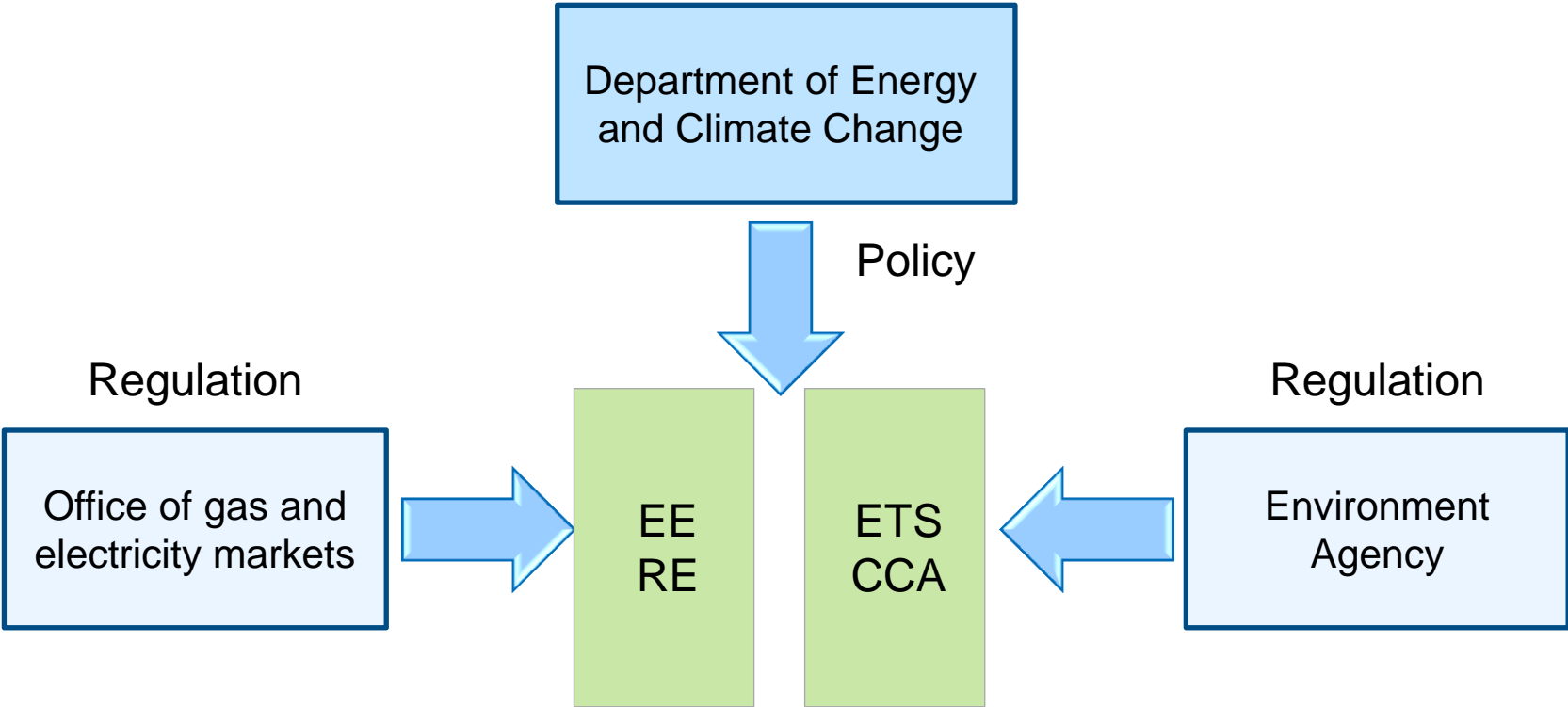
Project objectives

- Chinese Government is looking to international experience with energy saving certificate trading (also known as white certificate trading)
- Particular interest for this project - interactions between energy saving certificate trading and trading for carbon emissions and renewable energy
- Key interests:
 - Rationale for multiple targets (energy, carbon, renewables)
 - Rationale for multiple policy measures
 - Interactions between coexisting policy measures for energy, carbon and renewables
- Purpose - to review international experience/best practices and provide recommendations relevant to national context
- **Work contributes to the World Bank ESMAP funded technical assistance, to compliment a GEF project to establish energy savings monitoring and verification systems in China**

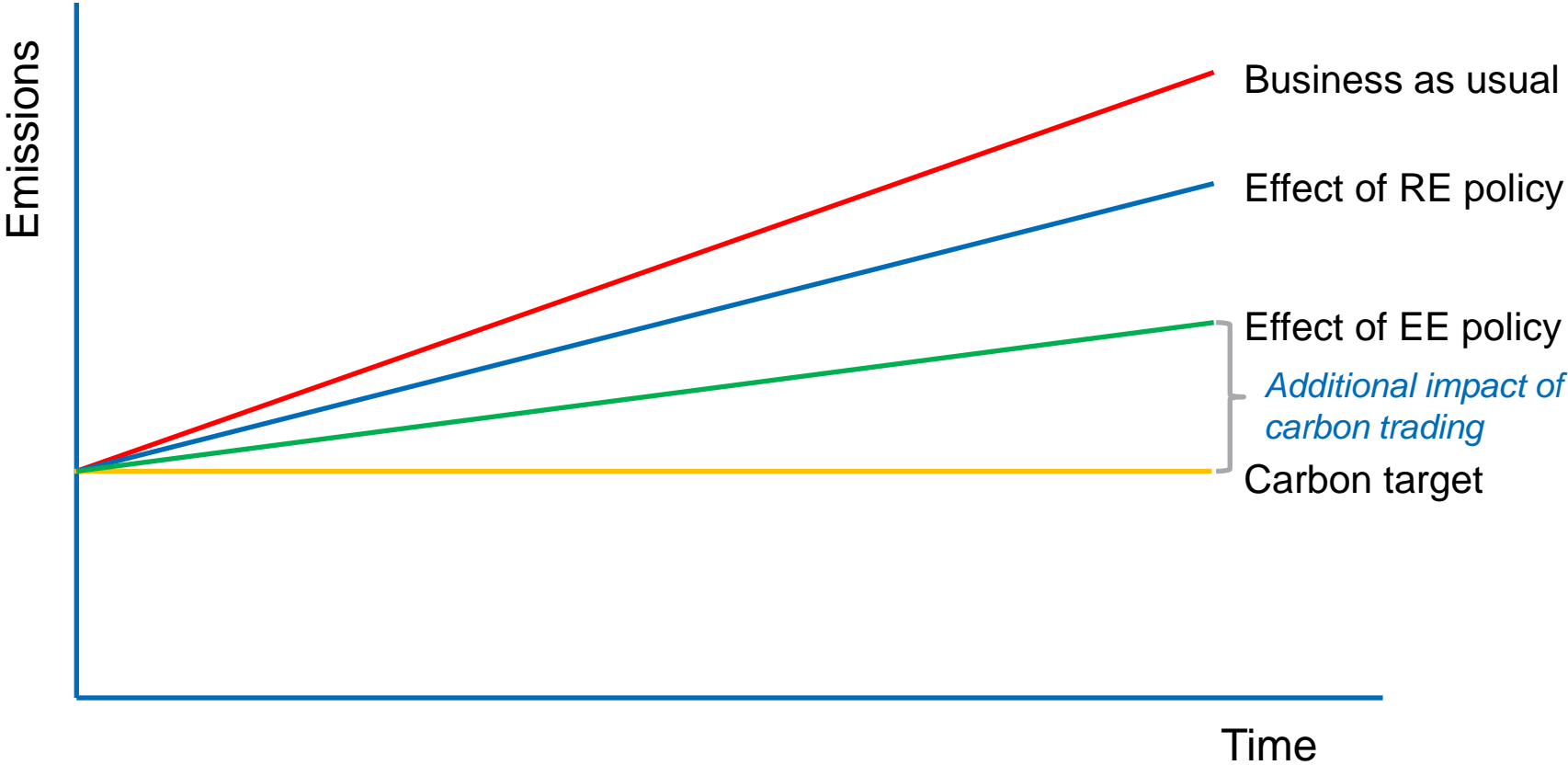
Region	Energy saving system	Carbon trading System	Renewable Energy System
UK	Energy Efficiency Commitment / Carbon Emission Reduction Target Climate Change Agreements	EU Emissions Trading System	Renewables Obligation
Italy	Titoli di efficienza energetica	EU Emissions Trading System	
California	Energy Efficiency Obligation	Cap-and-Trade Program	Renewable Portfolio Standard
India	Perform, Achieve, Trade		Renewable Energy Certificates

- Multiple targets common, e.g. EU 2020 targets: 20% improvement in energy efficiency, 20% energy from renewable energy, and 20% reduction in carbon emissions from 1990 level by 2020.
- Multiple policy aims. For example:
 - Energy security (reducing energy supply and pricing vulnerability)
 - Reduction in costs of energy
 - Increasing access and affordability for the poor
 - Local and global environmental benefits
- Primary focus of energy policy differed across regions examined, for example:
 - energy efficiency has been prioritised in California and India
 - EU the primary objective has been carbon emissions, - RE and EE policies contribute to carbon reduction objective, and broader energy policy objectives

- Multiple policy objectives have led to the use of multiple schemes
- White certificate trading focusses abatement on energy reduction. It complements cap and trade. Benefits:
 - energy security
 - fuel poverty / reduction of energy bills
 - avoiding investment in energy system expansion
 - focus on energy consumption will deliver reductions not incentivised by cap and trade
- Green certificates incentivise more expensive renewables
 - Overcome barriers to investment
 - Help reduce costs of new technologies
 - Job creation, green growth, diversity of supply
- Policy resilience



Coordinated target setting



- Energy efficiency systems

UK	Energy Efficiency Commitment (EEC) and subsequently Carbon Emission Reduction Target (CERT)	Climate Change Agreements
Rationale	Energy efficiency then carbon reduction	Energy efficiency of intensive trade exposed industries
Introduced	2002	2001
Point of regulation / obligated party	Energy suppliers, depending on customer numbers	Industrial consumers
Sector with targets	Electricity and gas, mostly domestic	Industrial consumers – electricity and primary fuels
Method to deliver scheme	Obligation on suppliers Tradable certificates/obligations	Mostly energy intensity targets. Reduction in carbon tax rate
Target	% historical energy supply (target changed to carbon emissions under CERT)	Reduction against baseline

- Carbon trading and renewable certificates

UK	EU Emissions Trading System (EU ETS)	Renewables Obligation
Rationale	Emissions reduction and wider energy policy aims	Cost effective renewable development, stimulate market and industry
Introduced	2005	2002
Point of regulation / obligated party	Direct emitters	Electricity suppliers
Sector with targets	Large Industry and Carbon Intensive Energy Production	Electricity suppliers (all electricity consumption)
Method to deliver scheme	Financial burden imposed by cap for every tCO ₂ emitted	Tradable certificates and buyout fund
Target	Emission reduction against baseline	% of electricity supplied

California	Energy Efficiency obligation (EEO)	Renewable Portfolio Standard (RPS)	Cap and Trade Program (CTP)
Rationale	Reducing energy bills and avoiding investment in energy system expansion (cost-effectiveness)	Sustainability and diversification	Climate protection
Introduced	Early 1970s	2003	2013
Point of regulation / obligated party	Investor owned utilities - electricity and natural gas	Retail energy sellers - electricity	Sources at least 25,000 tCO ₂ e/year
Sector with targets	All except transport but most residential and commercial	Electricity	Phase 1 (2013-2014): Elec. gen. + industry Phase 2 (2015-onwards): Elec. gen. + industry + distributors of transport fuel, natural gas and other fuel
Method to deliver scheme	Annual obligation of x% reduction in retail consumption + utility programs	Annual obligation of x% of retail energy sales must be RE	Annual allocations and off-set credits available
Target	Avoided consumption, Societal cost-effectiveness, Reduced per capita consumption.	Renewable share of energy generation.	Avoided carbon emissions. Reduction relative to 1990 in 2050

India	Perform, Achieve, Trade	Renewable Energy Certificates
Rationale	Energy efficiency of industry	Realise cost effective renewable opportunities
Introduced	March 2012	March 2011
Point of regulation / obligated party	'Designated Consumers (DC)' of large energy intensive industries	Electricity distributors/ suppliers <ul style="list-style-type: none"> • Distribution Licensees • Captive Consumers • Open Access users
Sector with targets	'Designated Consumers (DC)' of large energy intensive industries	State electricity consumption – included households, industries
Method to deliver scheme	Specific Energy Consumption (SEC) reduction target to be achieved by March 2015. Certificate trading	Renewable purchase Obligation (RPO) - % of renewable energy obligated for distribution utility in each State
Target	Savings 6.6million toe at the end of 1st PAT Cycle (by 2014-15)	15% of the country's electricity with renewable energy sources by 2020

Technical issues

Scope and coverage (energy, sectors)

Baselines and targets (level of target, type of target, how targets determined)

Allocation mechanisms

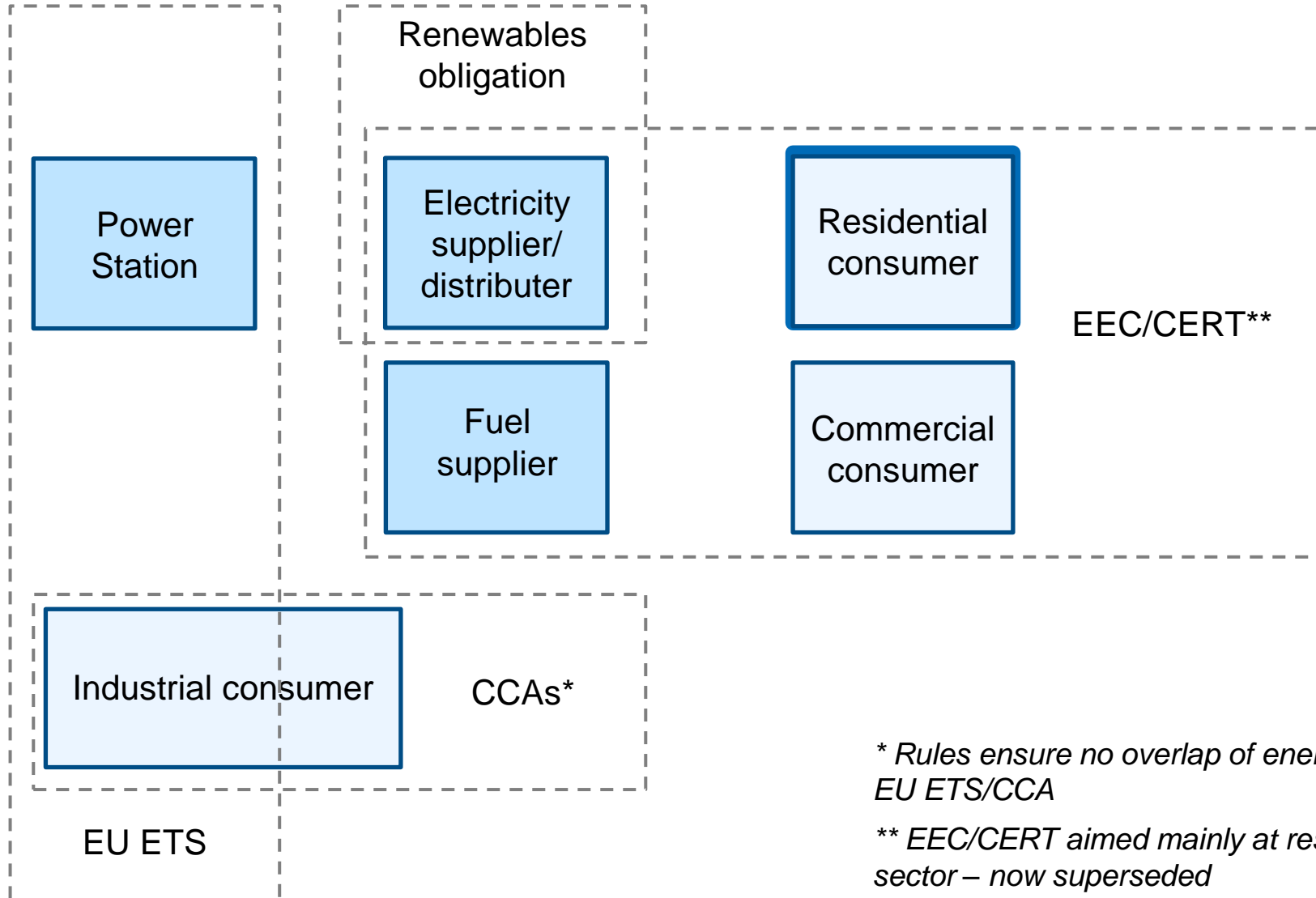
Monitoring, Reporting and Verification

Eligible technologies

Institutional arrangements

Linkage

- Carbon trading systems normally focus on industrial sectors and power generation
- Renewable Energy Certificate systems focus on the electricity supply sector
- Energy savings – two approaches
 - Supplier obligation - focus on smaller energy users, especially the residential sector
 - For example, UK, EEC/CERT aimed at residential energy users, especially fuel poverty
 - Italy TEE allowed projects from all sectors, most savings came from the residential sector
 - Californian EEO also allows savings in all sectors. Savings across all sectors
 - Systems focus on energy intensive industry – user obligation
 - UK CCAs and PAT. Eligibility rules cover specific sectors

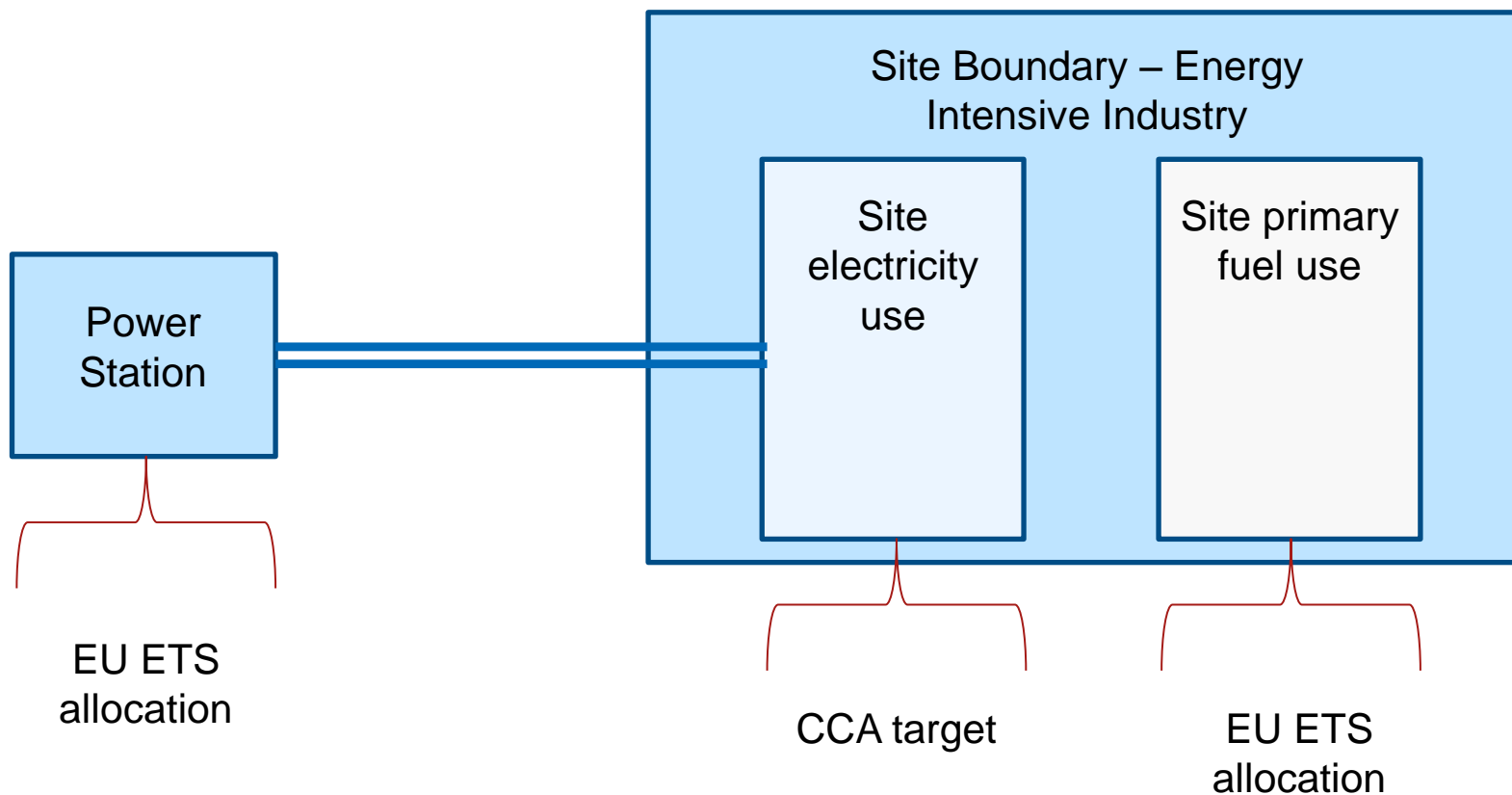


* Rules ensure no overlap of energy in EU ETS/CCA

** EEC/CERT aimed mainly at residential sector – now superseded

Target setting with overlapping systems

- In the UK Climate Change Agreements (CCAs) and EU ETS cover some of the same installations

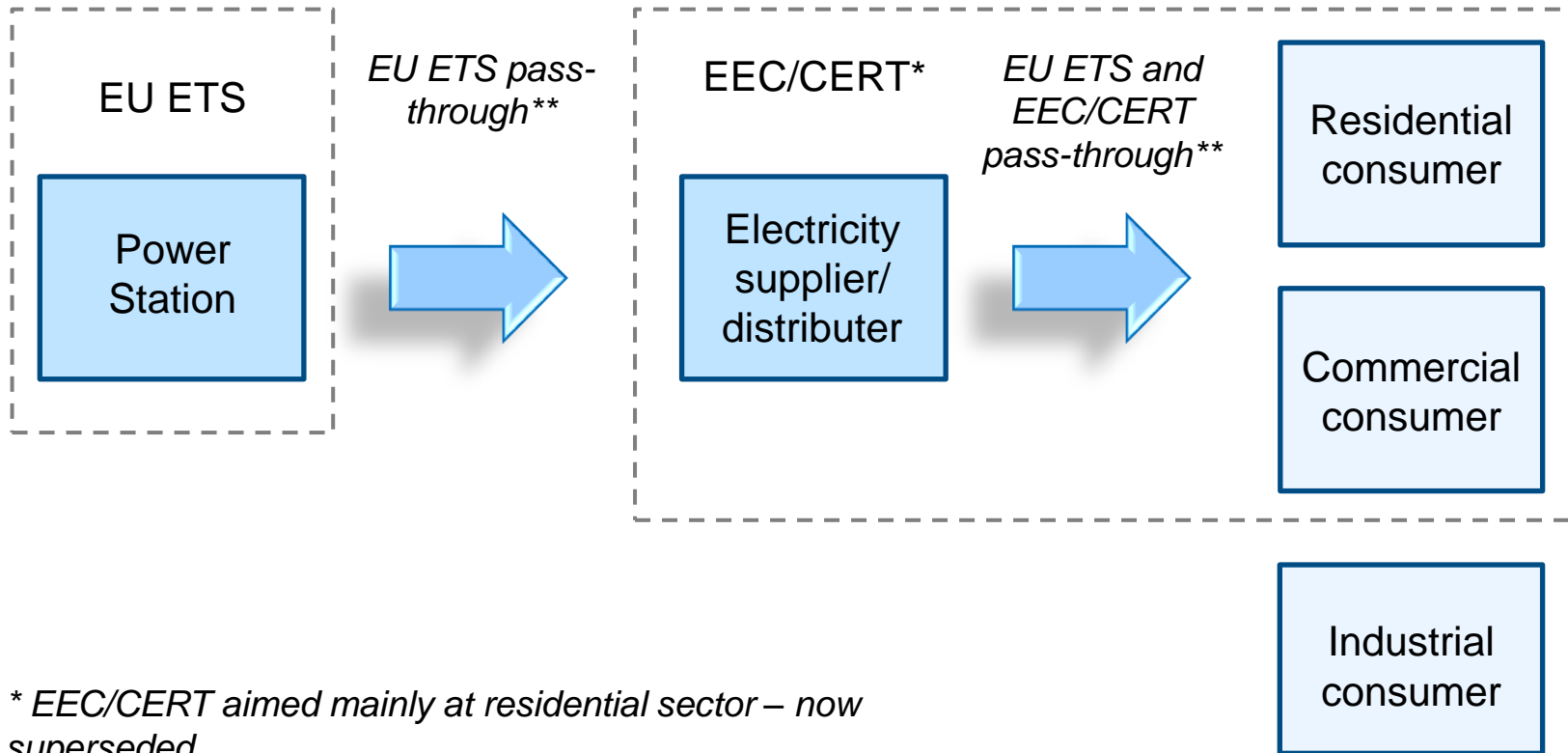


Indirect coverage

- Electricity generation and distribution/supply covered by multiple systems (Italy, California and the UK). Consequences:
 - Demand reduction policies reduce electricity generation – affect performance against carbon cap
 - If carbon cost pass-through then complex (and distorted) price signal for energy saving
 - If pass-through then consumers pay many times (carbon, EE, RE)
- Where pass-through of carbon cost of electricity generation is not possible, options to incentivise electricity saving measures:
 - Include electricity consumption in cap and trade
 - Include electricity consumption in energy saving/white certificate system

Indirect coverage – UK example

- In the UK electricity generation is covered by EU ETS and EEC/CERT includes electricity savings measures



* EEC/CERT aimed mainly at residential sector – now superseded

**Element of pass-through to residential, commercial and industrial tariffs depends on market

Monitoring, Reporting and Verification

- EU Emissions Trading System
 - Enterprise (installation)
 - Mandatory third party verification

- White certificates
 - Programme of projects
 - Energy data audits

- Perform, Achieve, Trade
 - Enterprise (installation)
 - Mandatory third party verification

Scheme	Example Non Compliance Regimes
White Certificates	<p>CERT scheme maximum non-compliance penalty 10% of obligated entity's annual turnover, with obligations not being carried to a further year.</p> <p>India PAT - 20,000 USD plus further penalty for the number of units short of the target.</p>
Carbon Cap and Trade Scheme	<p>EU ETS €100 per tCO₂e - obligations carry to the next year.</p> <p>CTP in California is charged per unit as in the EU ETS - four times the cost of auctioned units in that year.</p>
Green Certificates	<p>Renewables Obligation in UK - penalties as proportion of obligated suppliers turnover. Some discretion applied.</p> <p>The India, California and the UK - option to buy-out obligations - alternative to obtaining certificates.</p>

- Penalties can be more than per MWh/tCO₂ shortfall – e.g. enterprise turnover
- Make good provision common

- Rationale for co-existence of targets
 - Energy conservation is one of the highest priorities for the government - contributes to energy security, resource conservation, environmental sustainability, energy affordability, green growth, and competitiveness objectives
 - The main driver for RE policy in China is to build a world class RE manufacturing industry, improve energy security, and diversify energy mix to address the severe local air pollution
 - Therefore, the EE and RE targets are warranted and should continue – this can underpin trading
 - Chinese government is committed to climate change mitigation, and has set carbon intensity reduction target. Achieving the EE and RE target will help the achievement of the carbon intensity reduction target

Questions for discussion

- How can international experience described apply in China?
- How can systems focus on different coverage?
- What are the options for MRV:
 - Enterprise versus project/programme?
 - Energy data audit versus verification?
- How can institutional arrangements apply:
 - Policy and target setting?
 - Regulation?