Status and Overview of International Carbon Markets and Their Potential Linking

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01 *Why ETS?*

Policy Analysts Favor Carbon-Pricing (Carbon Taxes or Cap-and-Trade) Why?

- No other feasible approach can provide meaningful emissions reductions
- Least costly approach in short term (heterogeneous abatement costs)
- Least costly approach in long term (incentive for carbon-friendly technological change)
- It's likely a necessary – but not sufficient – component of effective and sensible climate policy

Source: Robert N. Stavins, Harvard Project on Climate Agreements

Alternative Environmental Policy Instruments

1. Conventional (Command-and-Control) Approaches
   a. Technology Standards
      i. Good News: low monitoring costs
      ii. Bad News: wrong goal, not c/e, no technological change
   b. Performance Standards
      i. Uniform Emission Standard (not c/e)
      ii. Uniform Ambient Standard (not c/e)
      iii. Non-uniform standard
         1. Can be c/e in principle
         2. But government lacks information, & politics

2. Economic-Incentive Approaches (to achieve c/e without gov't information)
   a. Pollution Charges – emissions fee (carbon tax)

Question: Is there a way the government can achieve environmental objective, do it cost-effectively, but without information about firms' abatement costs?

Source: Robert N. Stavins, Harvard Project on Climate Agreements

Challenges with Tax Approach

- **Government**
  - **Will target reductions be ac**
  - **Iterate up or down?**
  - **Forget quantity, set tax at e**
- **Private sector**
  - **Costs may be *greater* under**
  - **Tax is c/e, command-and-co**
- **Environmental advocates**
  - **Taxes make costs *visible***
  - **Fear that this will lead to *lo***
- **Politics**
  - ***T-word***

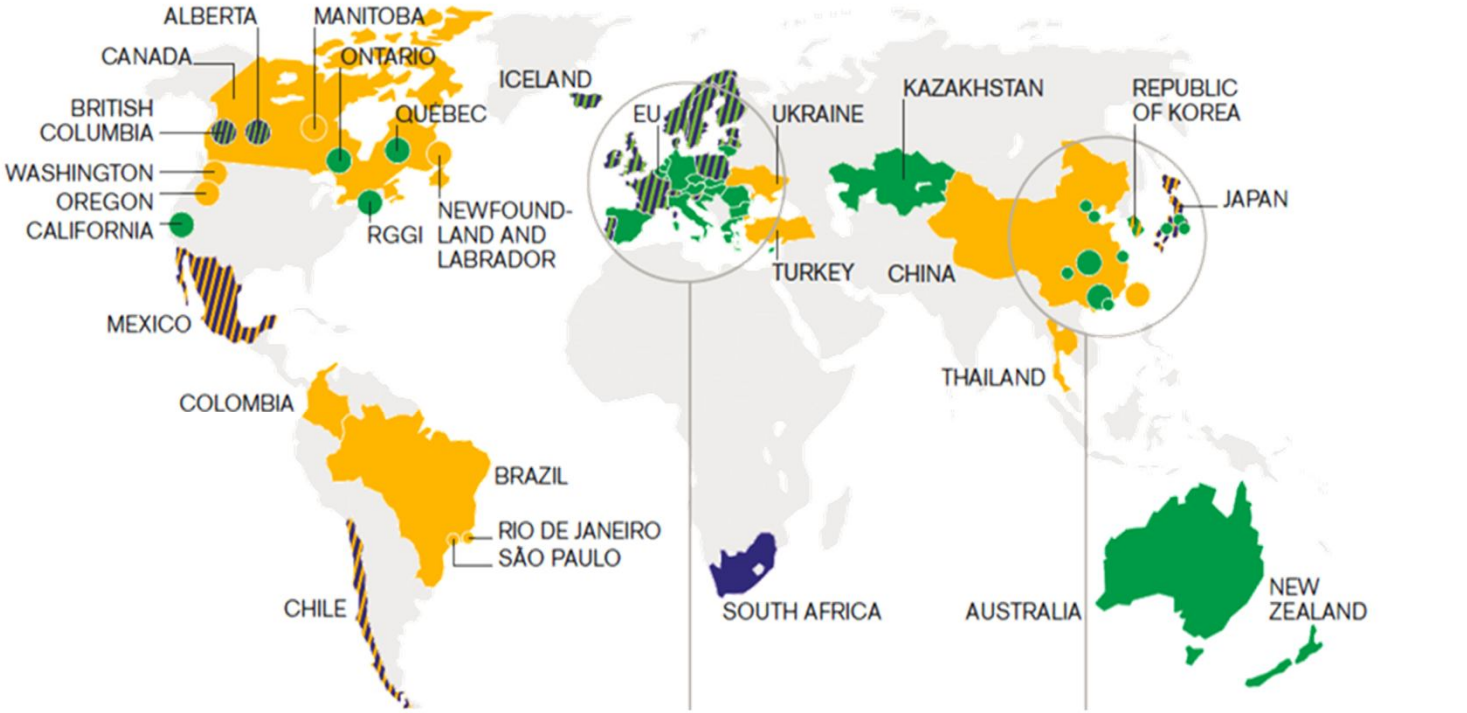
Question: Is there a way the government can:

- *achieve* environmental objective
- do it *cost-effectively*
- *without information* about firms' abatement costs
- *without uncertainty* of whether target will be met
- *without risk of placing greater costs* on private sector
- *without* makings *costs transparent*
- while *avoiding the T-word?*

Source: Robert N. Stavins, Harvard Project on Climate Agreements

02 *Status and Overview*

Over 13% of global emissions covered under carbon pricing policy



40 NATIONAL jurisdictions with carbon pricing initiatives

24 SUBNATIONAL jurisdictions with carbon pricing initiatives

42 CARBON PRICING INITIATIVES implemented or scheduled for implementation

COVERING ANNUAL GLOBAL GHG EMISSIONS OF

7 $GtCO_2e$ = 13%

Source: World Bank

EU ETS

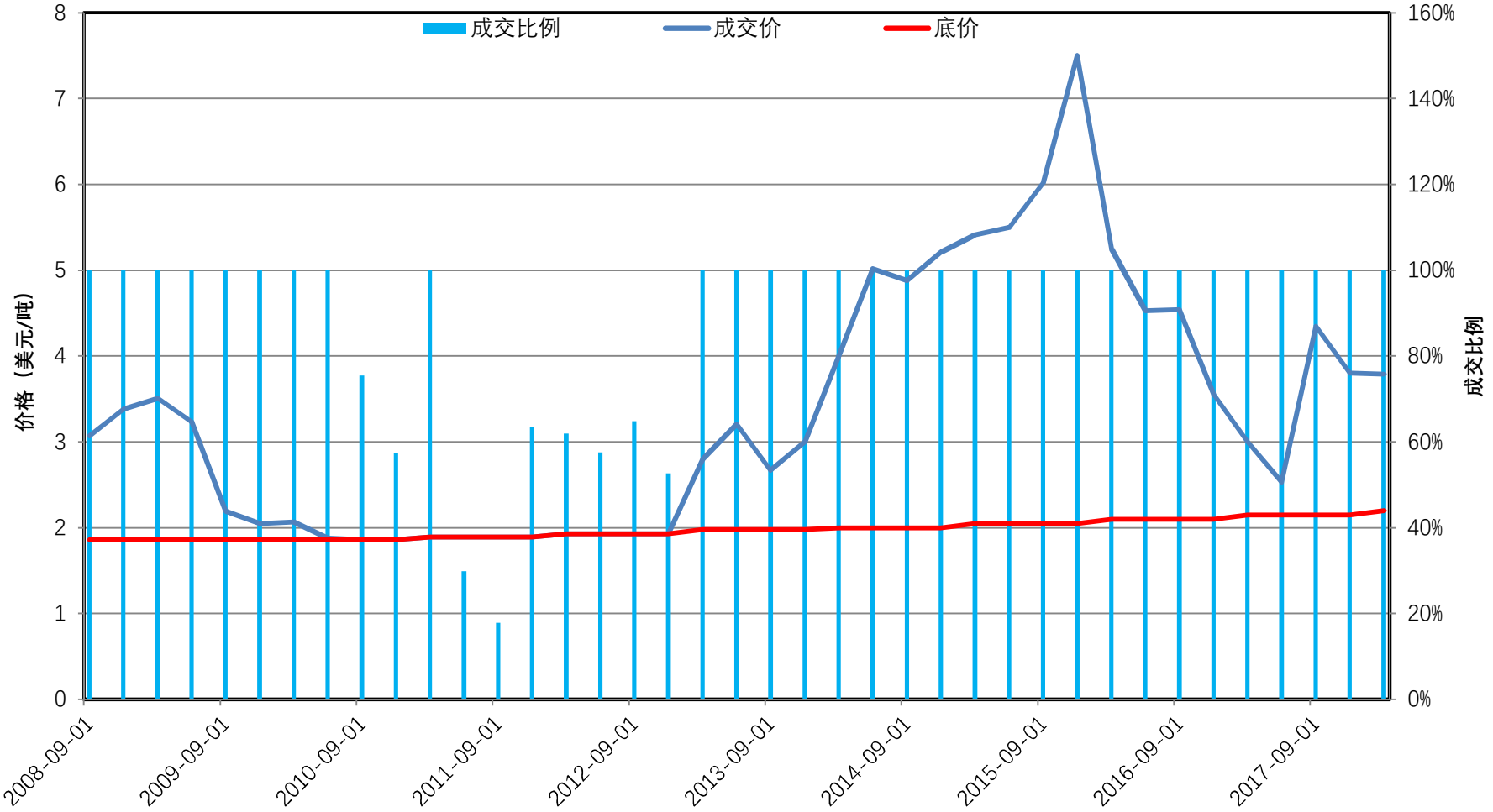
EU-ETS Phase 4 Reform:

- Cap tightened:
  - Available allowances reduced by 2.2% annually
  - Allowances to be transferred to Market Stability Reserve (MSR) increased from 12% to 24% annually
  - Allowances in MSR exceed previous year's auctioned amount will be cancelled from 2023 onwards

EU-ETS International Units:

- Approximate remaining demand up to end of 2020 – 8 million units per annum
- Post-2020 EU-ETS (Phase 4: 2021-2030) still envisions zero international unit use

US RGGI


成交比例
成交价
底价
价格（美元/吨）
成交比例
8
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5
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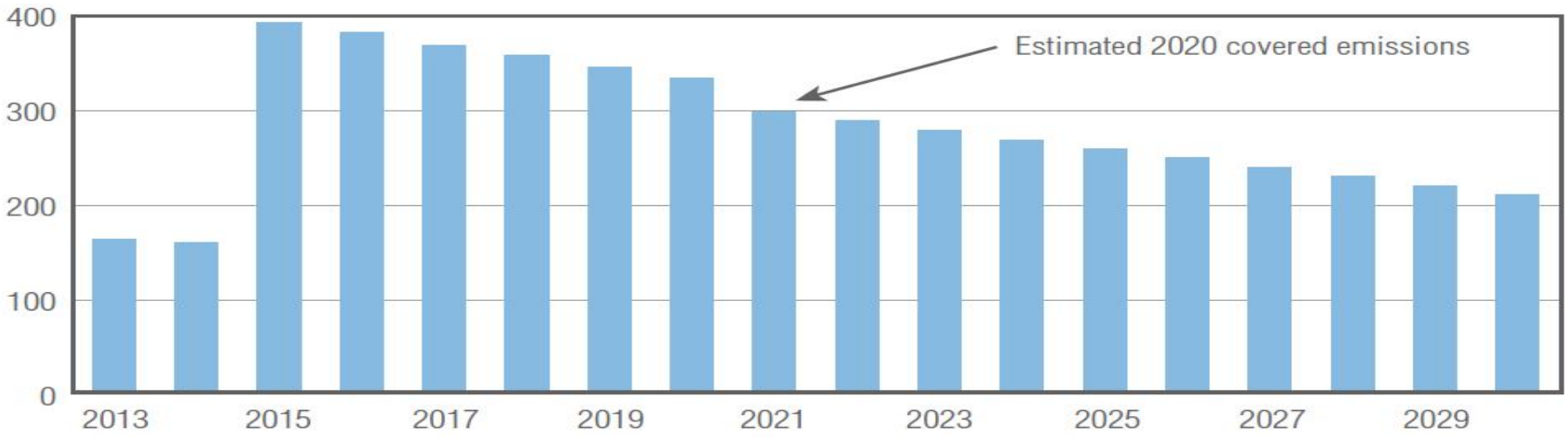
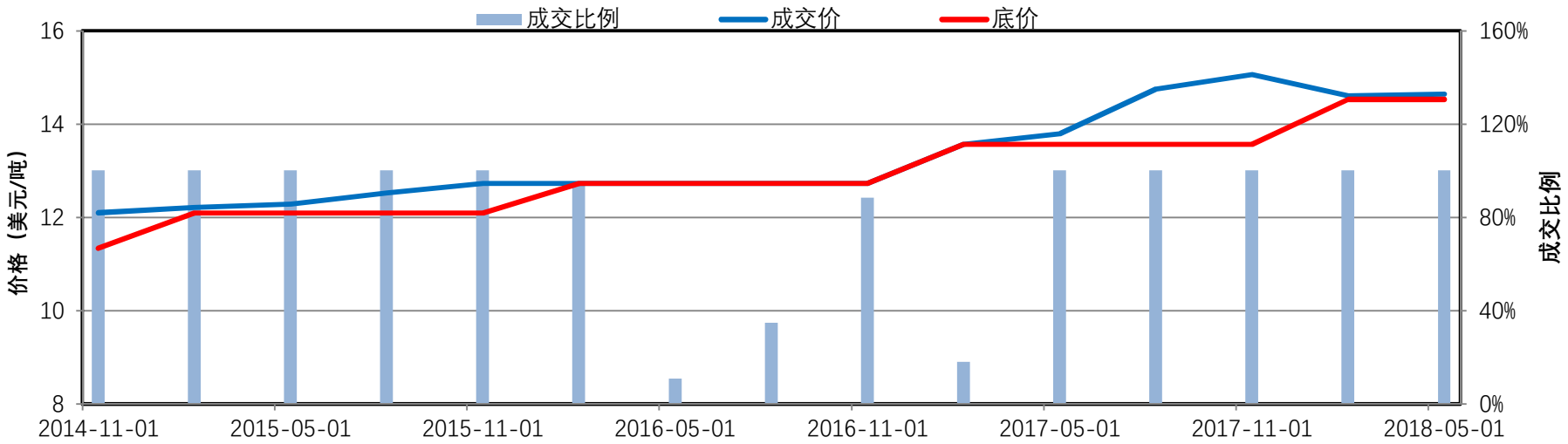
US California





Canada

Pan-Canadian Framework for Clean Growth and Climate Change:

- Provides for a federal carbon pricing 'backstop" to provide benchmark
- Technical paper released in Jan 2018: provides for
  - A tax to be introduced at 10$/t rising to 50$/t over five years
  - An output based system for trade exposed industries
  - Output based system to provide for international transfers of credits

Ontario ETS:

- New Conservative government elected; election commitment to scrap ETS which is part of WCI

South Korea

Korean ETS

- Price increases of close to 20% in May 2018 led government to deploy the market stability reserve via auction
- Domestic price pressure driving continued use of conversion of cancelled CERs to KOC
  - Total Korean CER cancellation in 2018 in excess of 1 million
- Potential demand for non Korean CERs after 2020

South Africa

South Africa Carbon Tax:

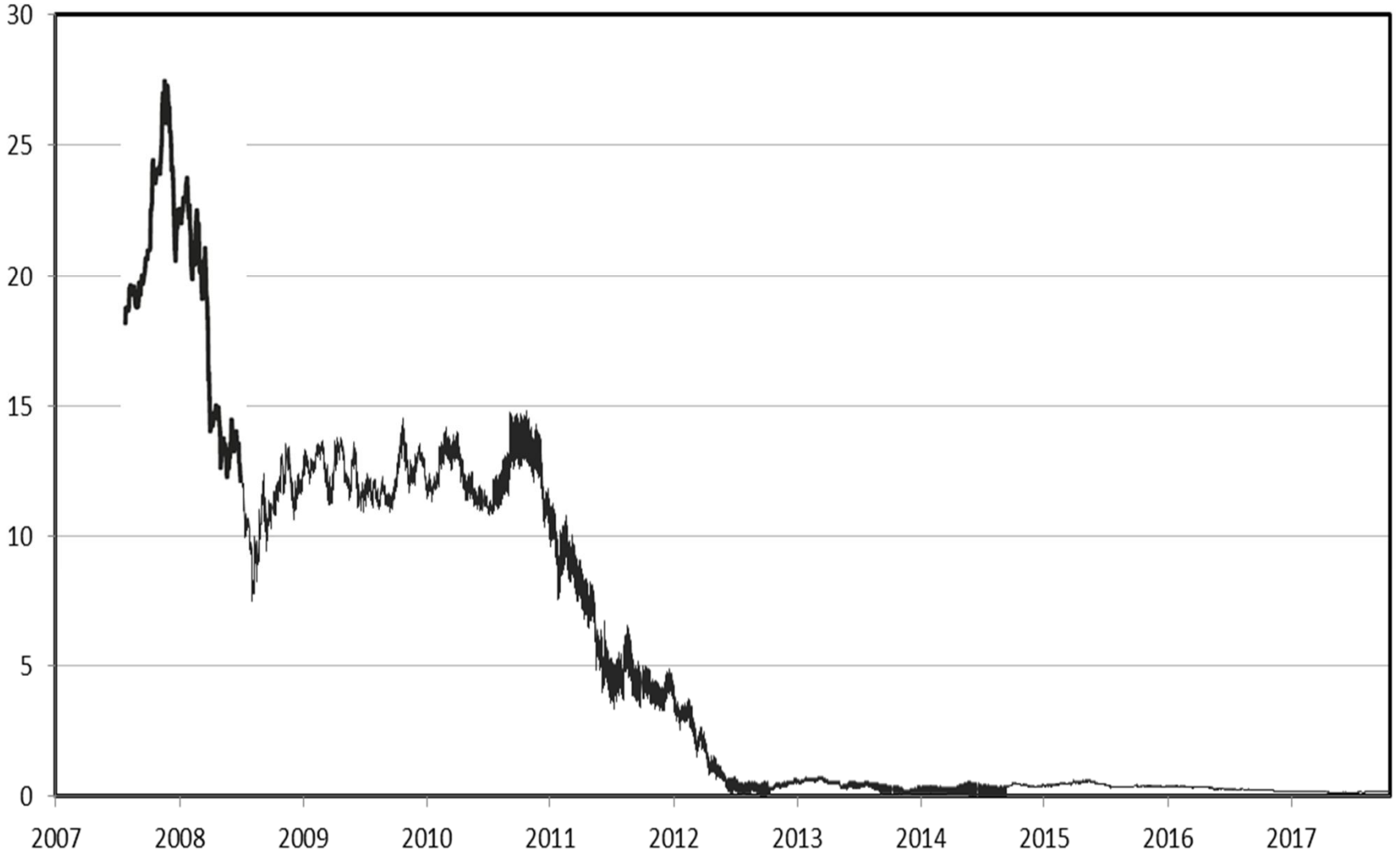
- Following delays, most recent budget speech has announced that the tax will be applied from 1 January 2019. Consultation on details just closed:
  - ZAR 120 per tonne (eqv. to €8/t) of liable emissions will be imposed on all entities, companies and installations that emit >100,000 t/yr.
  - Able to use between 5%-10% eligible domestic offsets to reduce tax liability as well as tax free thresholds (from 60% up to 80% depending on sector)
  - Eligible offsets must be from South African hosted projects and may include CDM projects and possibly also VCS and Gold Standard projects
  - ZA National Treasury estimates offset demand at 17.5 MtCO2e/year, registered PAs and PoAs could supply approx. 11 million CERs/year

Columbia

Colombia Carbon Tax:

- **Tax imposed since 1 January 2018 at rate $5/t**
- **Tax exemption for companies offsetting their emissions with domestic CERs**
- **Almost 1.5 million CERs from Colombian CDM projects have been cancelled in 2018 – approximately 40% of all demand for CP2 CERs**

CDM


30
25
20
15
10
5
0
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017

ICAO-CORSIA

- Timeline
  - 1. The pilot phase (2021-2023), where countries can participate on a voluntary basis.
  - 2. The first phase (2024-2026), where countries can participate on a voluntary basis.
  - 3. The second phase (2027-2035), where all countries must participate.
- Implementation timeline:
  - Jun 2018: ICAO Council to adopt the SARPs and related guidance material (i.e. CORSIA Rulebook)
  - Jan 2019: SARPs enter into force
  - Jan 2021: CORSIA obligations start

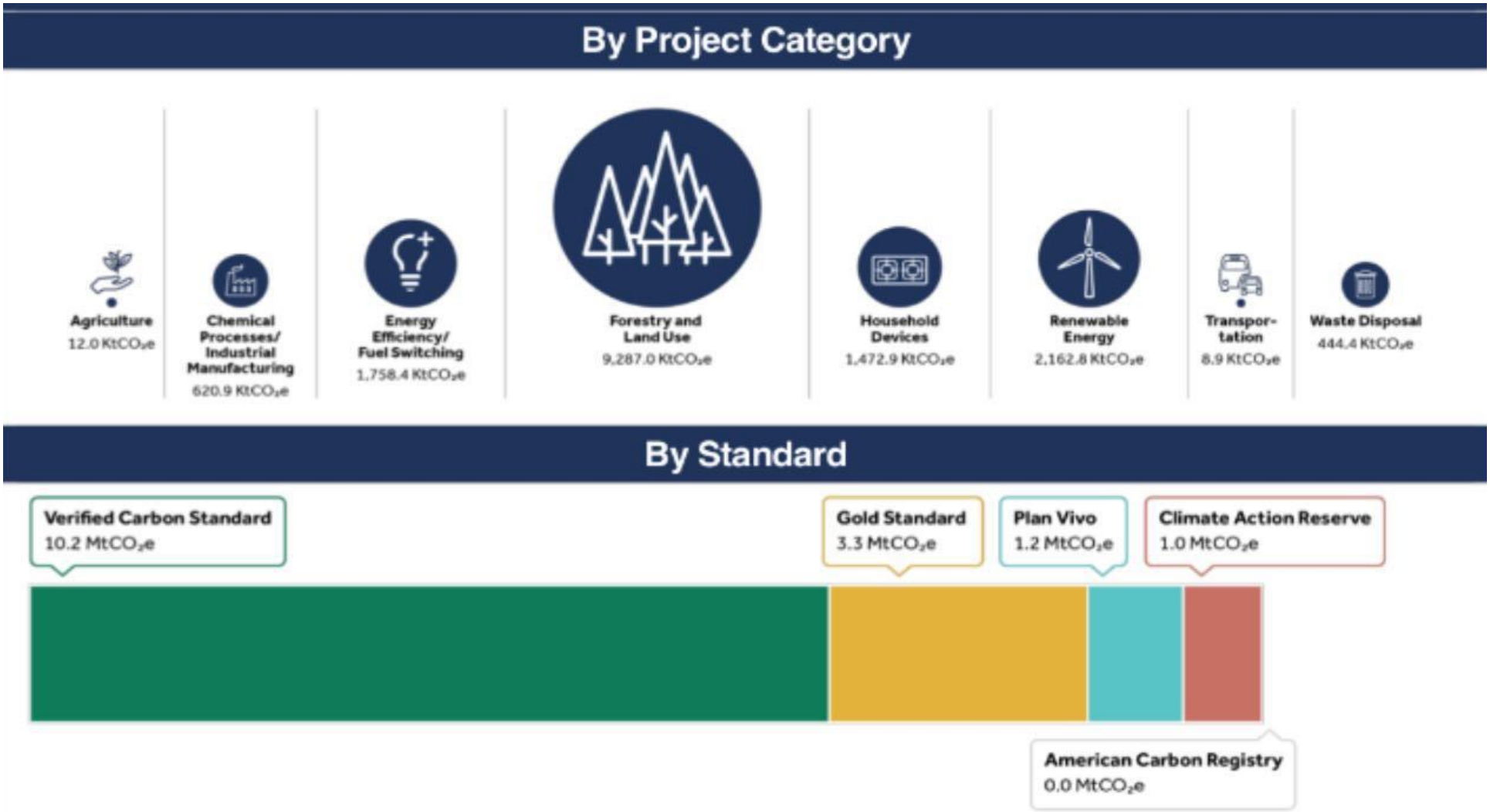
- Eligibility for CORSIA
  - Eligible units for CORSIA must meet Emission Unit Criteria (EUC) in SARPs that will be adopted in Jun 2018

IMO

Initial strategy:

- Vision
  - "IMO remains committed to reducing GHG emissions from international shipping and, as a matter of urgency, **aims to phase them out as soon as possible in this century**"
- Levels of ambition
  - GHG emissions: "to **peak** GHG emissions from international shipping **as soon as possible** and to **reduce** the total annual GHG emissions **by at least 50% by 2050 compared to 2008 whilst pursuing efforts towards phasing them out as called for in the Vision** as a point on a pathway of CO2 emissions reduction consistent with the Paris Agreement temperature goals "
  - Carbon intensity: "to **reduce** CO_2 emissions per transport work, as an average across international shipping, by **at least 40% by 2030, pursuing efforts towards 70% by 2050, compared to 2008**"

Voluntary Markets

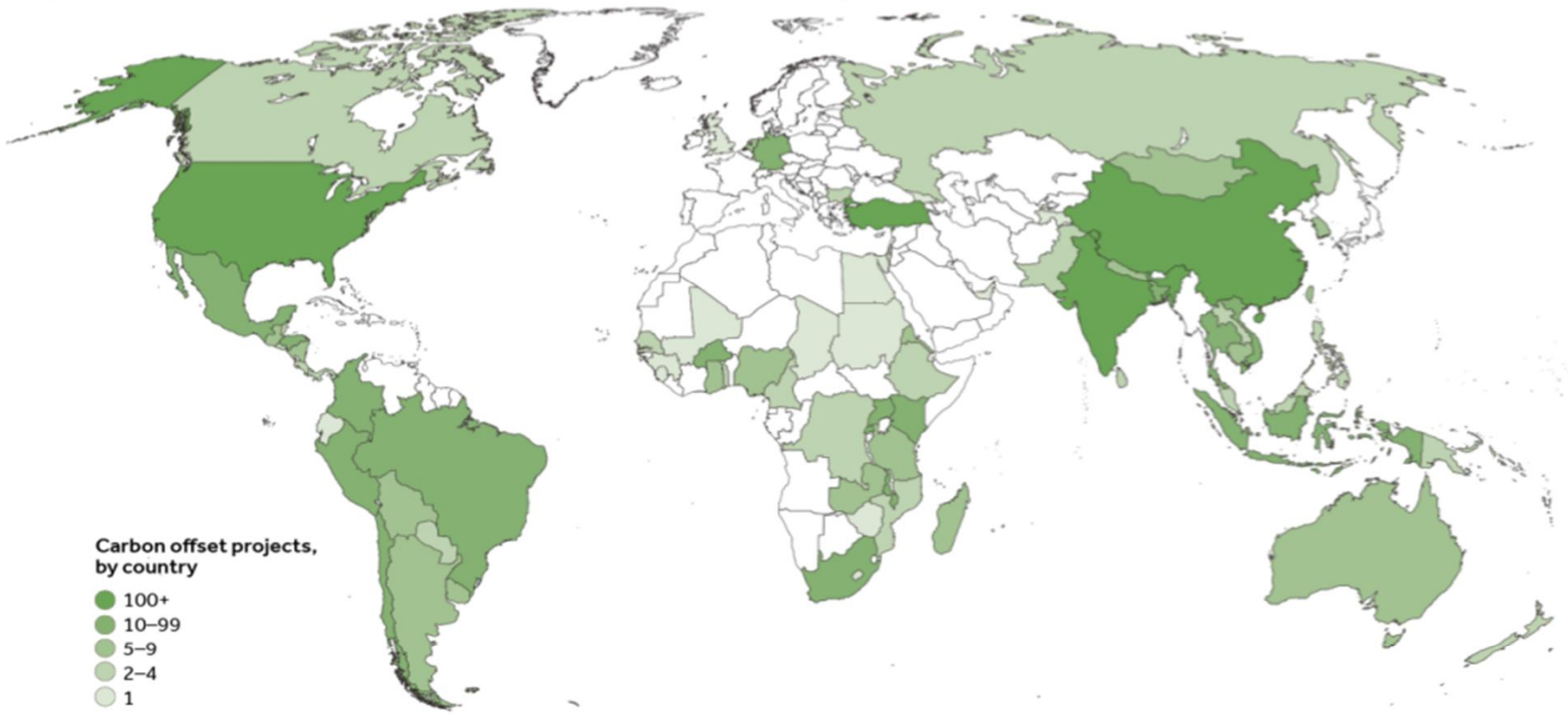


160 projects issued 15.8 MtCO2e Offsets Jan-March 2018

Sources: Ecosystem Marketplace, Voluntary Carbon Markets Insights

Voluntary Markets

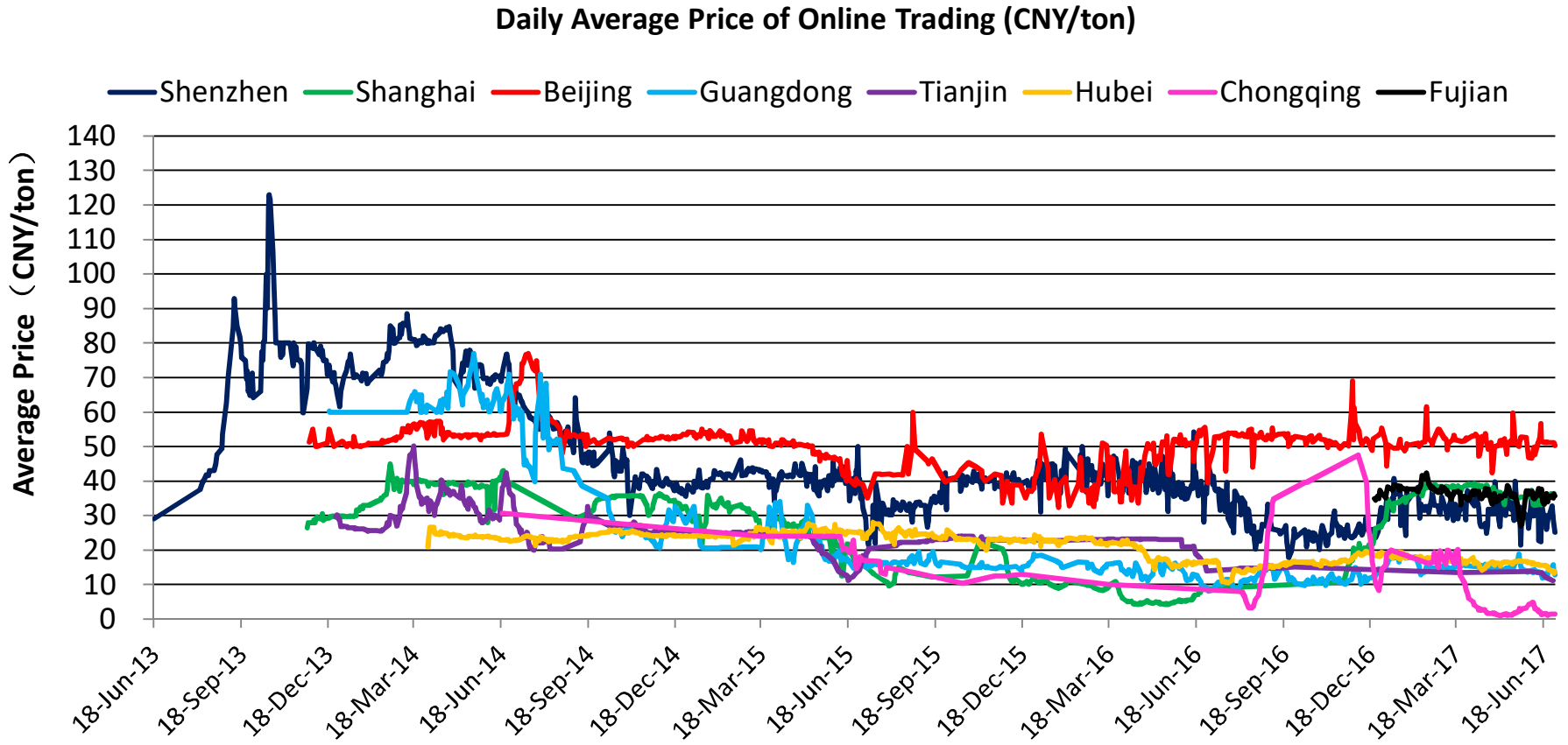
Figure 1. Locations of Voluntary Carbon Offset Projects, 2008-2018



Notes: The map shows only projects that have issued offsets through the following voluntary carbon standards from 2008 to Q1 2018: American Carbon Registry (ACR), Climate Action Reserve (CAR), Gold Standard, Plan Vivo, and Verra's Verified Carbon Standard (VCS) as of April 2018. Although projects were issued by voluntary standards, some projects' offsets may eventually be sold on compliance markets, such as California's Cap and Trade or Colombia's Fuel Tax. Based on data from 2,008 projects in 82 countries.

Sources: Ecosystem Marketplace, Voluntary Carbon Markets Insights

China pilots



- Up to June 2017, accumulated trading volume in the pilots reached 185 millions tons, representing value of 4.35 billion CNY. The average price is 23.5 CNY/ tCO2 .
- The prices were volatile in the starting period, then became more stable. Pilots prices vary considerably, ranging from 1 to 69 CNY/CO2 in 2017.

China pilots

learning-by-doing

Legal Foundation

Rules Improvements

Robust Data Basis

Market Oversight

Capacity Building

Review and Improving

China National ETS

Launch	Infrastructure Phase	Testing Period	Deepen & Improving
2017.12.19	About 1 Year	About 1year	After
	• Trading system • Registry • Reporting • Regulatory Framework • Capacity Building	• Testing with power sector • Risk management • Improving the infrastructure and design	• Spot Allowance Trading in Power Sector • Expand coverage • Enrich products • CCER

Market based mechanisms are key instruments for achieving targets

Pricing environmental resources and rights

- **Carbon emission：** pilots started in 2013 and national market will be launched in 2017
- **Pollutants :** pilots started in 2007
- **Water utilization :** pilots started in 2014

Electric vehicle ——zero emission

- Being promoted by government
- NDRC: integration into ETS
- MIIT: EV credits + Fuel standards

Green certificate —— power de-carbonization

- Source: solar PV and land wind
- 1 certificate = 1000 kwh

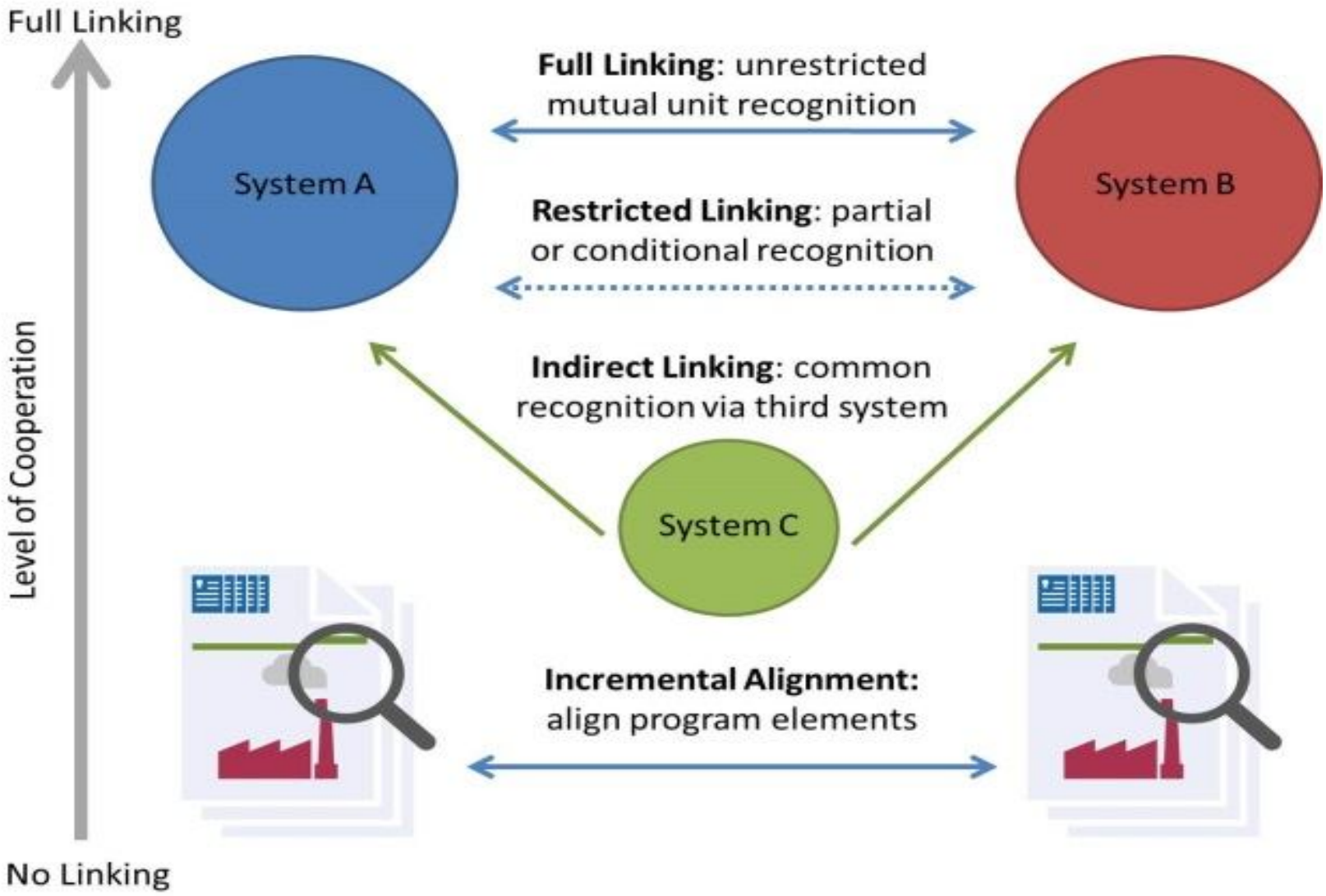
03 *Linking?*

Top Down: Paris Agreement?

- Kyoto Framework
  - ETS, CDM, JI
  - QERLOs and accounting rules
  - Compliance

- Paris Agreement
  - NAMAs based on voluntary basis
  - Article 6 mechanism: ITMOs? Accounting rules?
  - Basic principles: avoiding double counting

Bottom up: Bilateral Linking?



Source: ICAP, A guide to linking emissions trading systems

Bottom up: Bilateral Linking?

	Potential benefits of linking	Potential risks of linking
Economic	• Increased cost efficiency • Increased market liquidity and reduced exposure to external shocks • Creates an even playing field and reduces leakage	• Shocks in linking partner's jurisdiction can translate to the other
Environmental	• Increased ambition • Stimulates green technology	• Linking to a system with weak environmental integrity • Linking to a system with weak reduction targets
Political/ Administrative	• Momentum for climate action and leadership • Streamlines administrative processes for firms operating in both jurisdictions • May enable one jurisdiction to adopt an already proven administrative structure	• Distributional concerns • Financial transfers • Contagion of design features if not harmonized • Loss of domestic control over the system

Source: ICAP, A guide to linking emissions trading systems

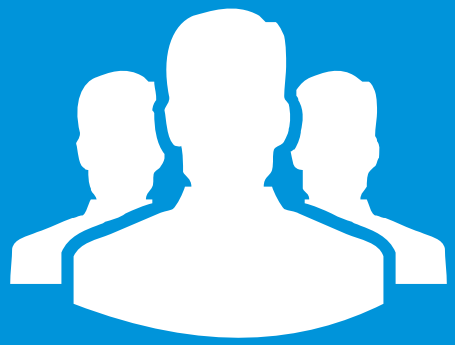
Bottom up: Bilateral Linking?

- Cases
  - EU ETS +Norway + Switzerland + Croatia
  - California + Quebec + Ontario
  - RGGI model

- Factors and Challenges
  - Linking Type: one way linking or two way?
  - Restrictions?
  - Timeline?
  - Designing Elements: level of alignment, stage of development, effects to market?
  - Linking agreement
  - Management responsibilities

Conclusions

- ETS is proliferating worldwide as one of the key policy instrument to reduce carbon emissions by Regions, Nations and sub-Regions , due to its advantage that no other instruments can have.
- EU ETS as the pioneer of policy tool, although encountered challenges and problems, after several round of improvements and reform, especially the latest round of reform, it remains most active and is still believed to be the most robust market.
- Linking existing carbon markets proves to be pretty challenging, although there are some quite successful stories. The new round of negotiations on designing a new market mechanism under the Paris Agreement is anticipating new structure of international cooperation, drawing on experiences of CDM and JI under the Kyoto Protocol.
- CDM and other offsetting market is undergoing a dormant period, although trading under voluntary market remains a small but active and stable market. CORSIA developed under framework of ICAO provides some new frontiers for the offsetting market, including a possible revival of part of CDM.



Thank You !

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