



Article 6 Economic Analysis Workshop

25 January 2023



Agenda

- Opening remarks
- Findings from modelling runs
 - The impact of dropouts and club composition
 - Q&A
- Views from the negotiating room
 - Panel discussion: What to expect for carbon markets in 2023 and beyond
 - Q&A
- Closing remarks



Thanks!



SCHOOL OF
PUBLIC POLICY
CENTER FOR GLOBAL
SUSTAINABILITY



European Bank
for Reconstruction and Development



Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety



**NORWEGIAN MINISTRY OF
CLIMATE AND ENVIRONMENT**



Department for
Business, Energy
& Industrial Strategy



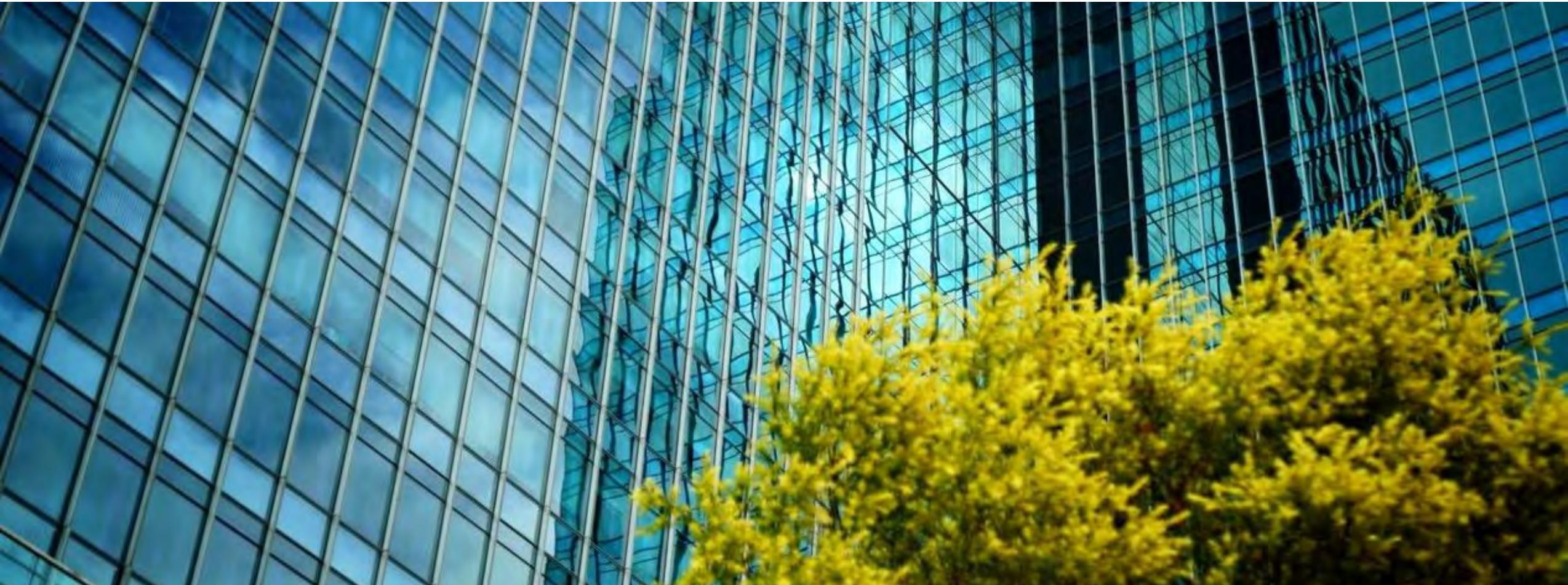
The Rules of the Workshop

- Modified Chatham House Rule
 - You can report what was said, but not who said it, without their explicit permission
 - Presentations will be made available, unless the presenter requests that they not be
 - The agenda and attendees will be part of the open report of the meeting
- Snowmass rules
 - No whining
 - No grand standing
 - This is NOT all about you (the Snowmass Rule)
 - Do not break any of these rules unless you can break them all in less than 5 minutes (the Snowmass exception)



WELCOME REMARKS

- Dirk Forrister, IETA



Presentation

Findings from modelling runs: The impact of dropouts and club composition

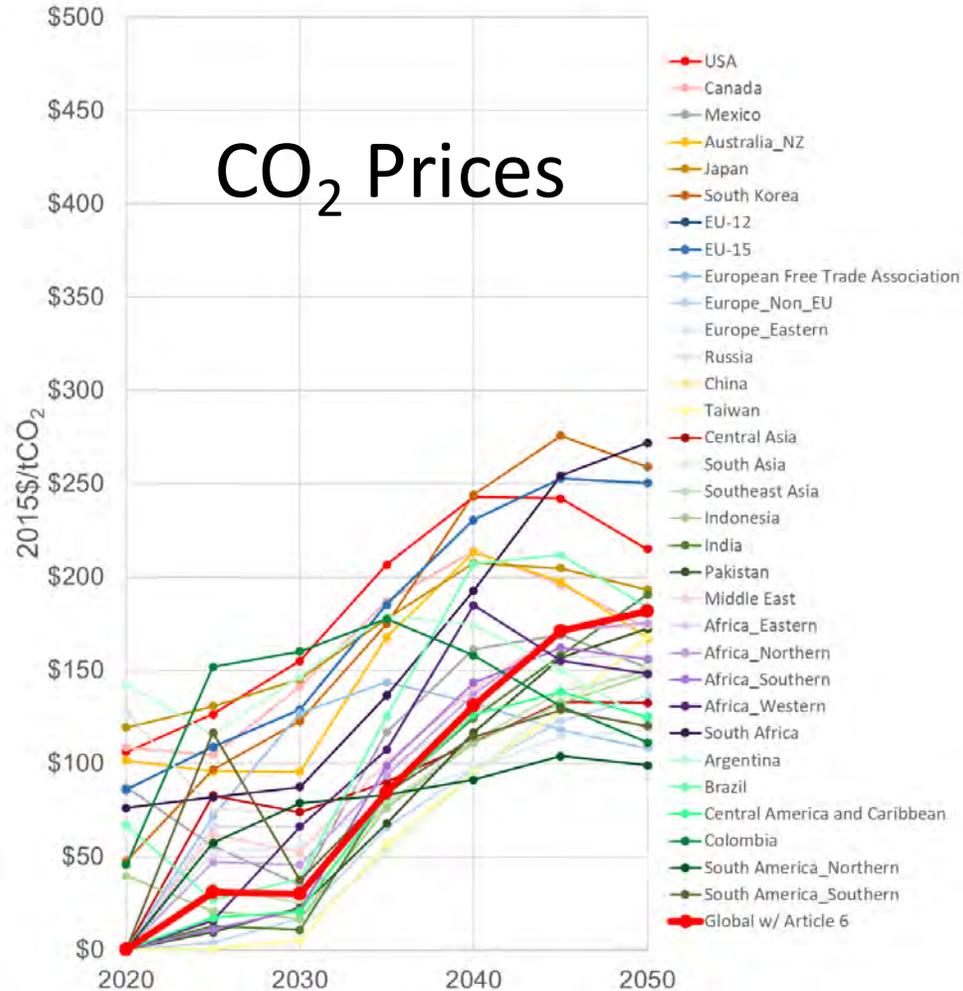
Jae Edmonds and Mel George, UMD/PNNL

Key Messages

- **Article 6 holds enormous potential for enabling Paris ambition.**
- Countries that continue to cooperate using Article 6 continue to benefit even when a large emitter does not participate.
- The club you join can affect how a country benefits from cooperative emissions mitigation.

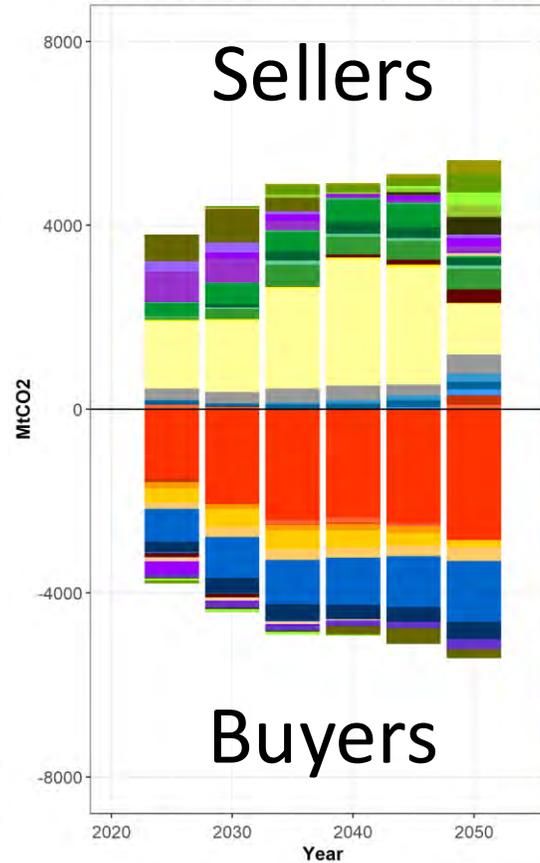
A Global Carbon Market—Updated to Glasgow

Glasgow Increased Ambition



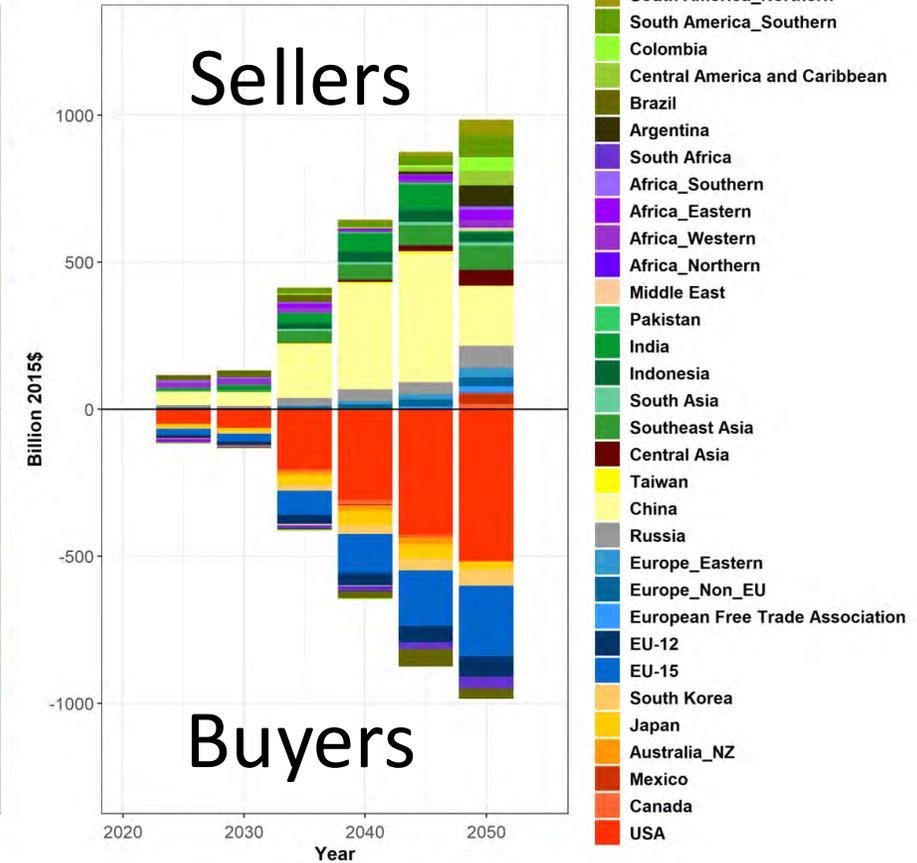
CO₂

Trade Flows Increased Ambition (MtCO2)

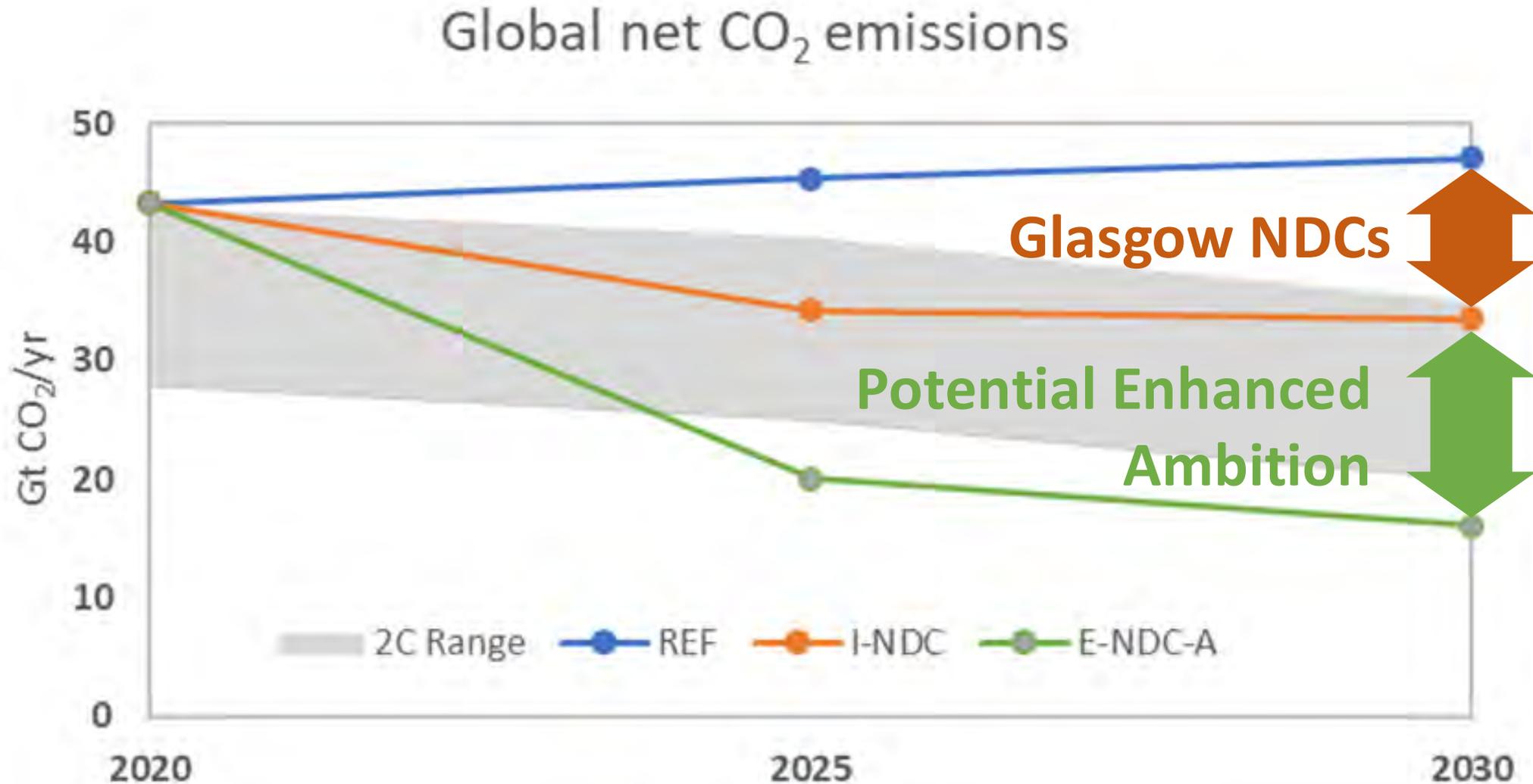


\$

Financial Flows Increased Ambition (Billion 2015\$)



A Global Carbon Market—Updated to Glasgow

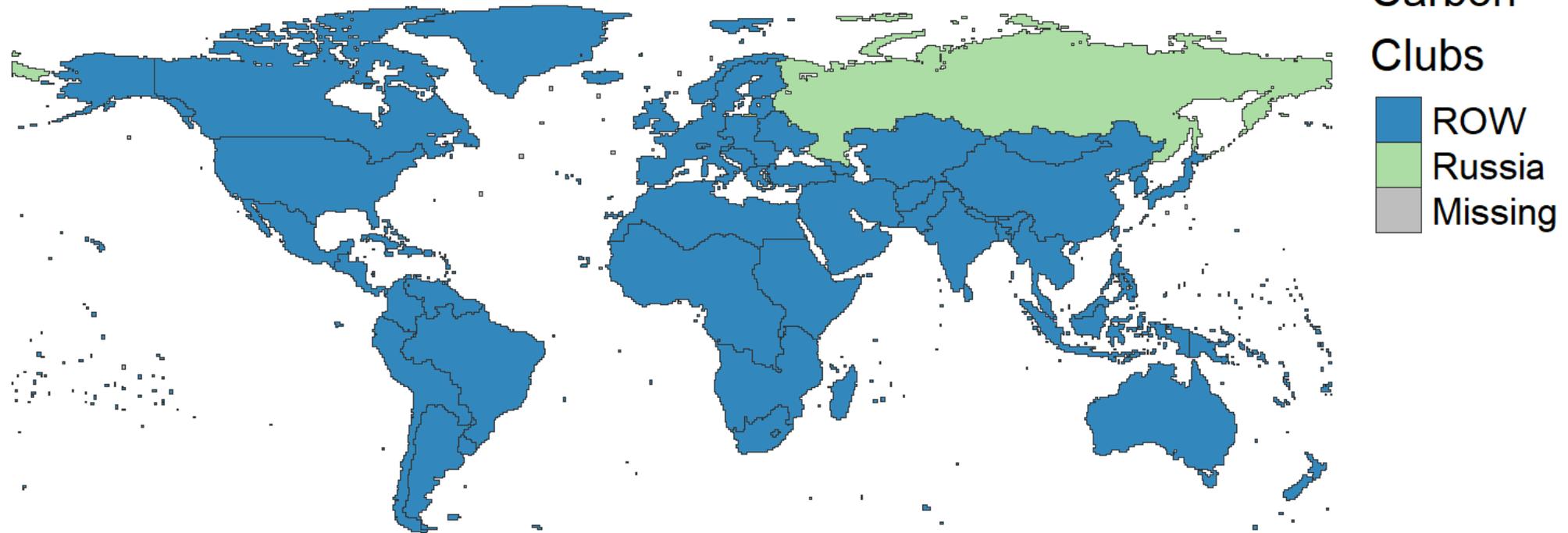


Impact of Dropouts

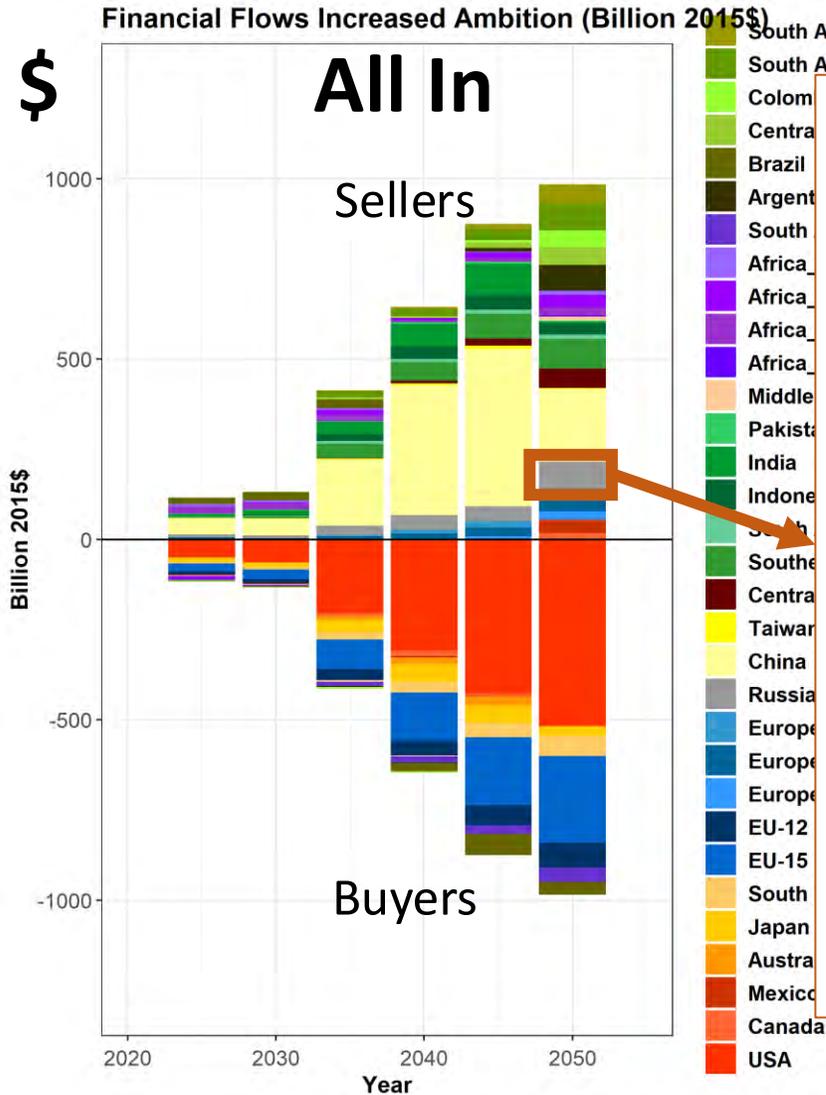
Countries that continue to cooperate using Article 6 continue to benefit even when a large emitter does not participate.

Impact of Russian Federation Independent Implementation

Cooperative Implementation of NDCs Without the Russian Federation



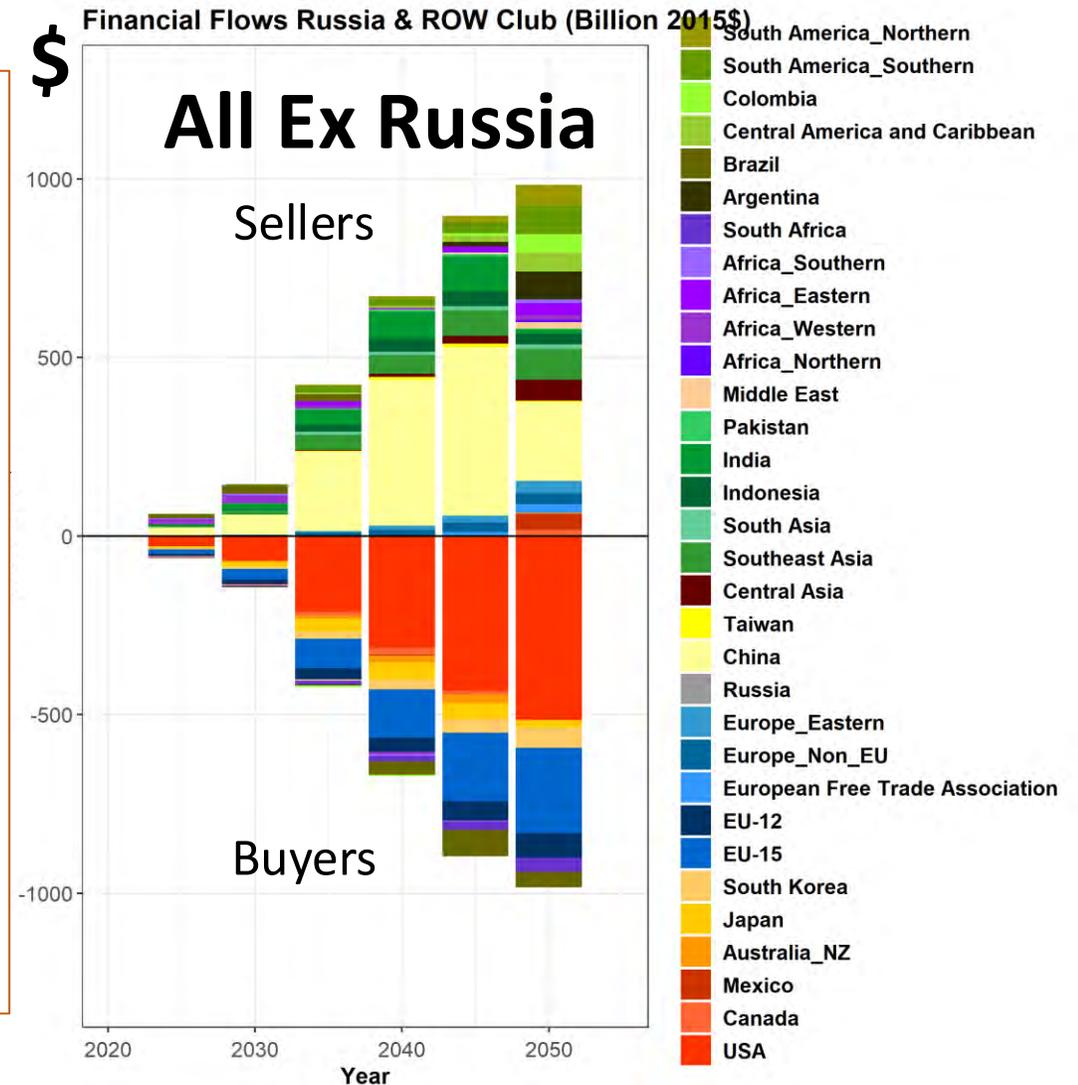
Carbon Markets with and without the Russian Federation



Russia
Revenue loss:

\$75 billion in
2050

Cumulative
\$850 billion
2022 to 2050



Dropping Any Individual Country Leaves the Market Largely Intact But Reduces Mitigation Incentives for the Country that Mitigates Independently

CO₂ Prices

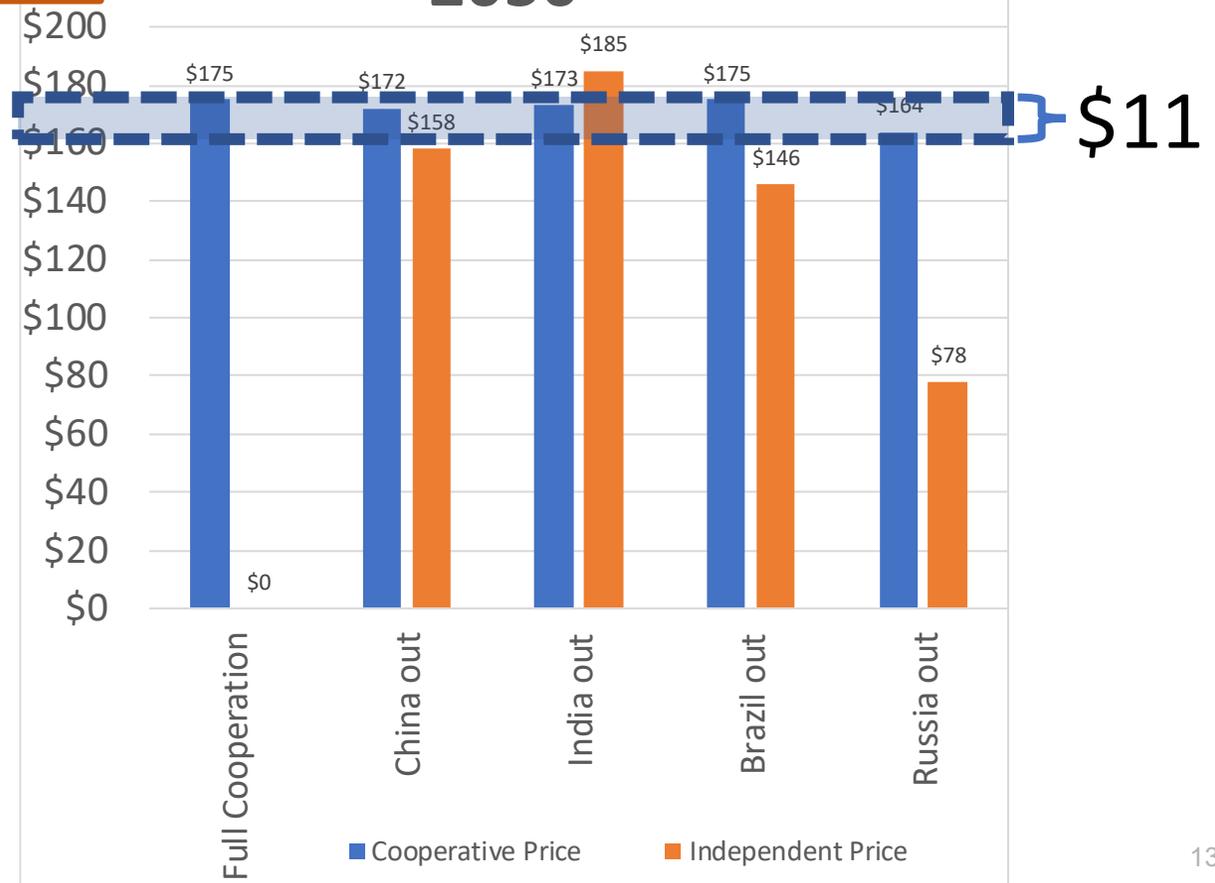
Impact on Marginal Cost of Mitigation from a Large Selling Region Not Engaging in Cooperative Mitigation

2030



Impact on Marginal Cost of Mitigation from a Large Selling Region Not Engaging in Cooperative Mitigation

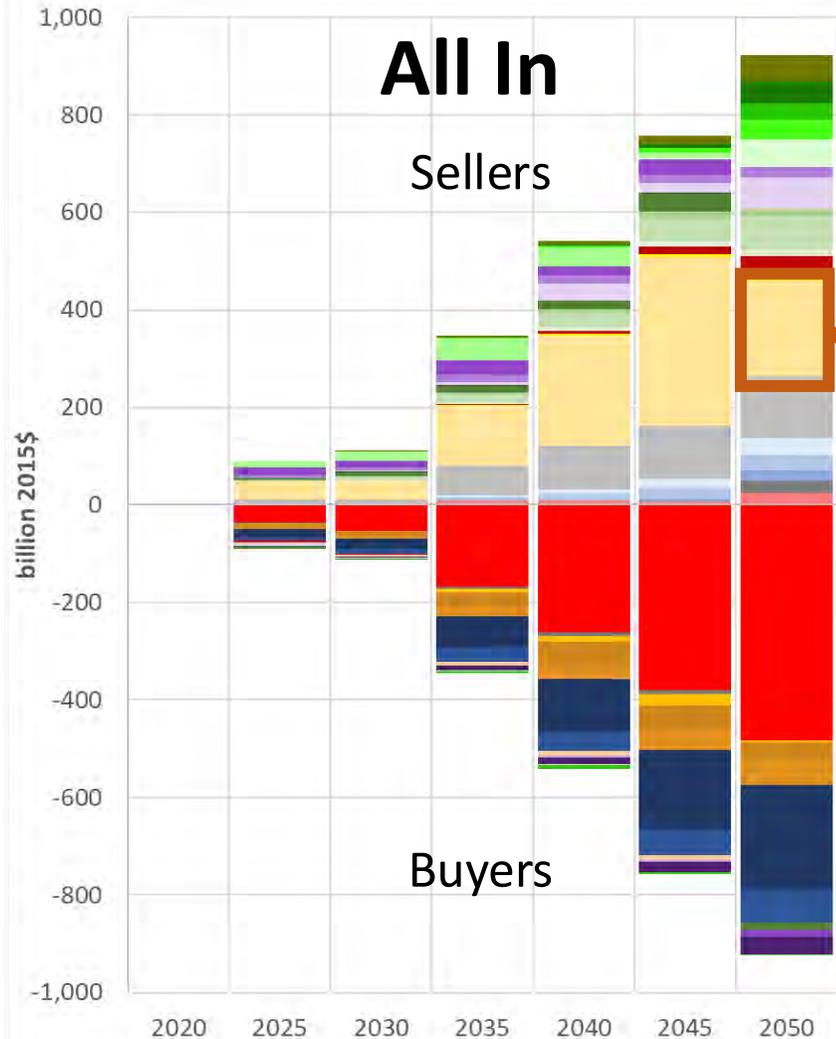
2050



Carbon Markets with and without China

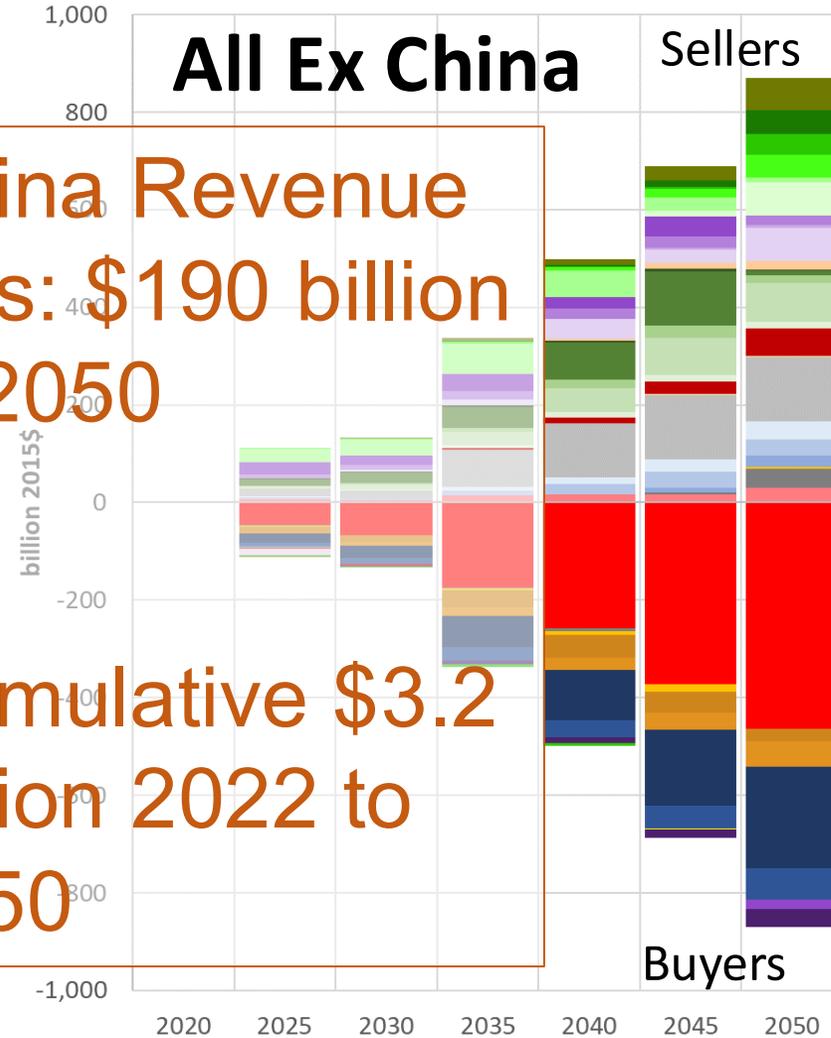
\$

Financial flows increased ambition



- South America Southern
- South America Northern
- Colombia
- Central America
- Brazil
- Argentina
- South Africa
- Africa Western
- Africa Southern
- Africa Northern
- Africa Eastern
- Middle East
- Pakistan
- India
- Indonesia
- Southeast Asia
- South Asia
- Central Asia
- Taiwan
- China
- Russia
- Eastern Europe
- Europe Non EU
- EFTA
- EU-12
- EU-15
- S. Korea
- Japan
- Aus_NZ
- Mexico
- Canada
- USA

Financial flows RoW excluding China

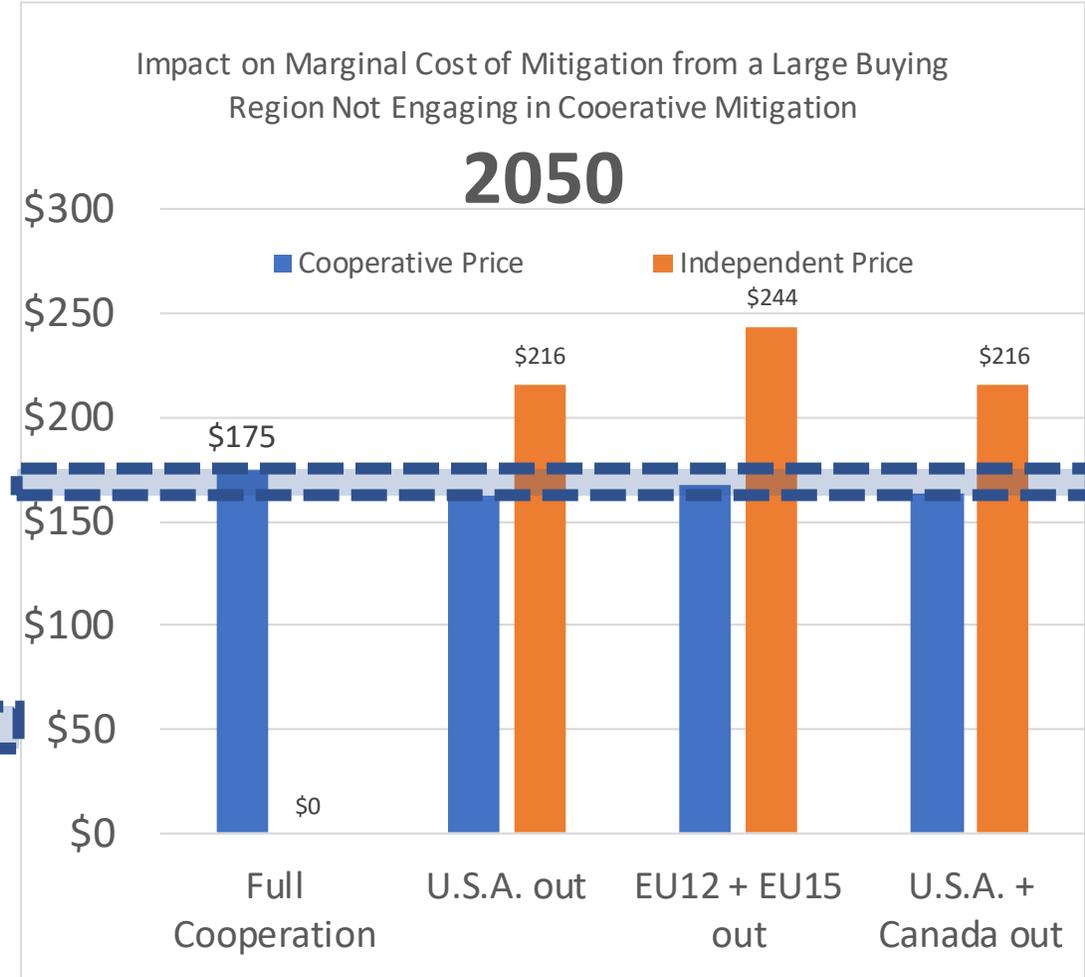
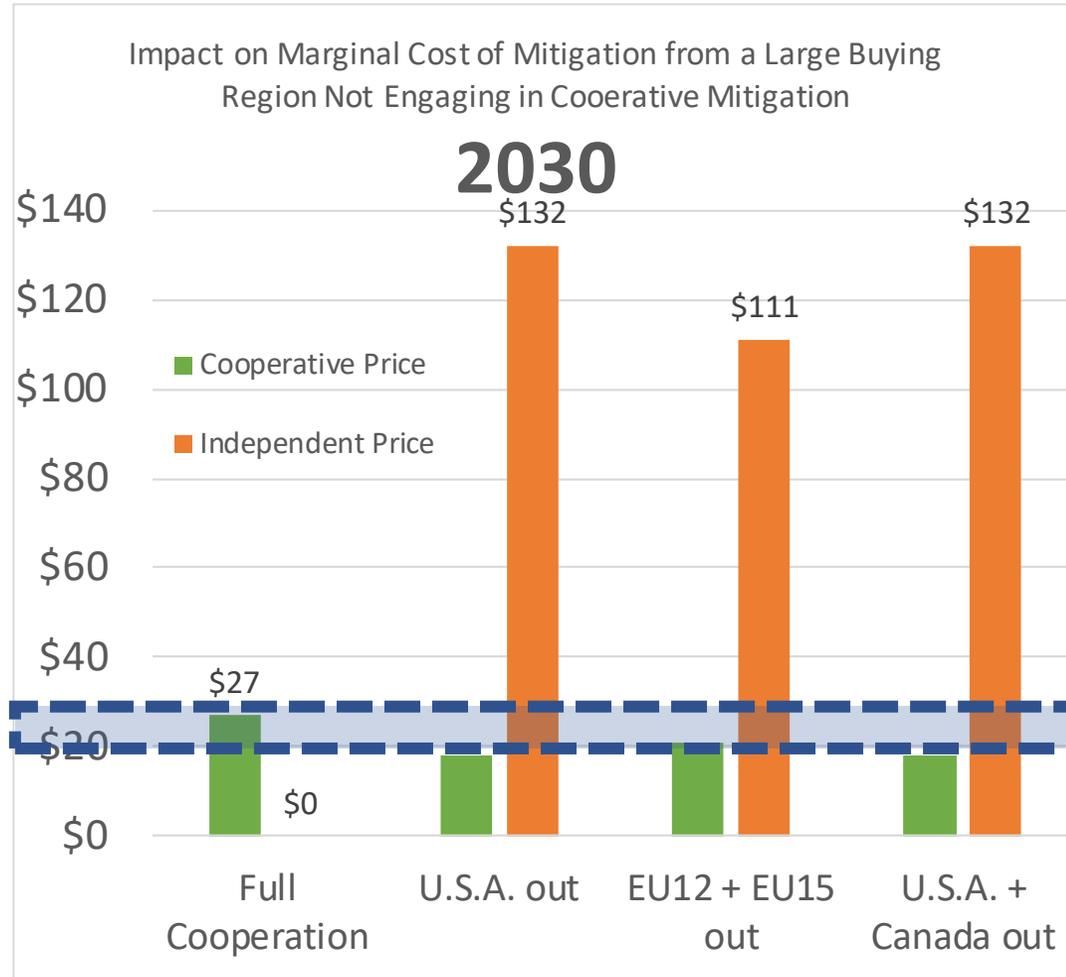


- South America Southern
- South America Northern
- Colombia
- Central America
- Brazil
- Argentina
- South Africa
- Africa Western
- Africa Southern
- Africa Northern
- Africa Eastern
- Middle East
- Pakistan
- India
- Indonesia
- Southeast Asia
- South Asia
- Central Asia
- Taiwan
- China
- Russia
- Eastern Europe
- Europe Non EU
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- S. Korea
- Japan
- Aus_NZ
- Mexico
- Canada
- USA

China Revenue loss: \$190 billion in 2050

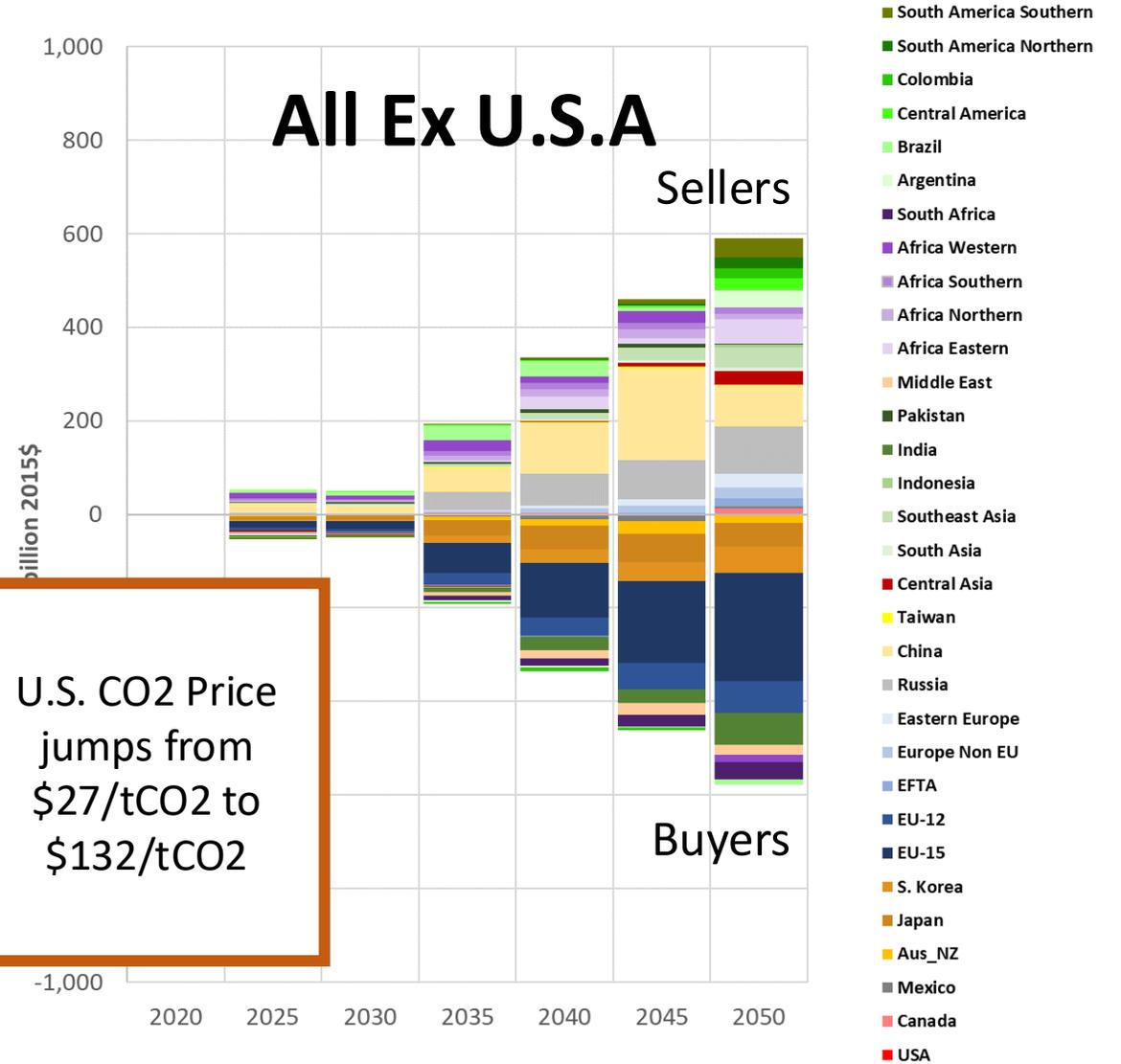
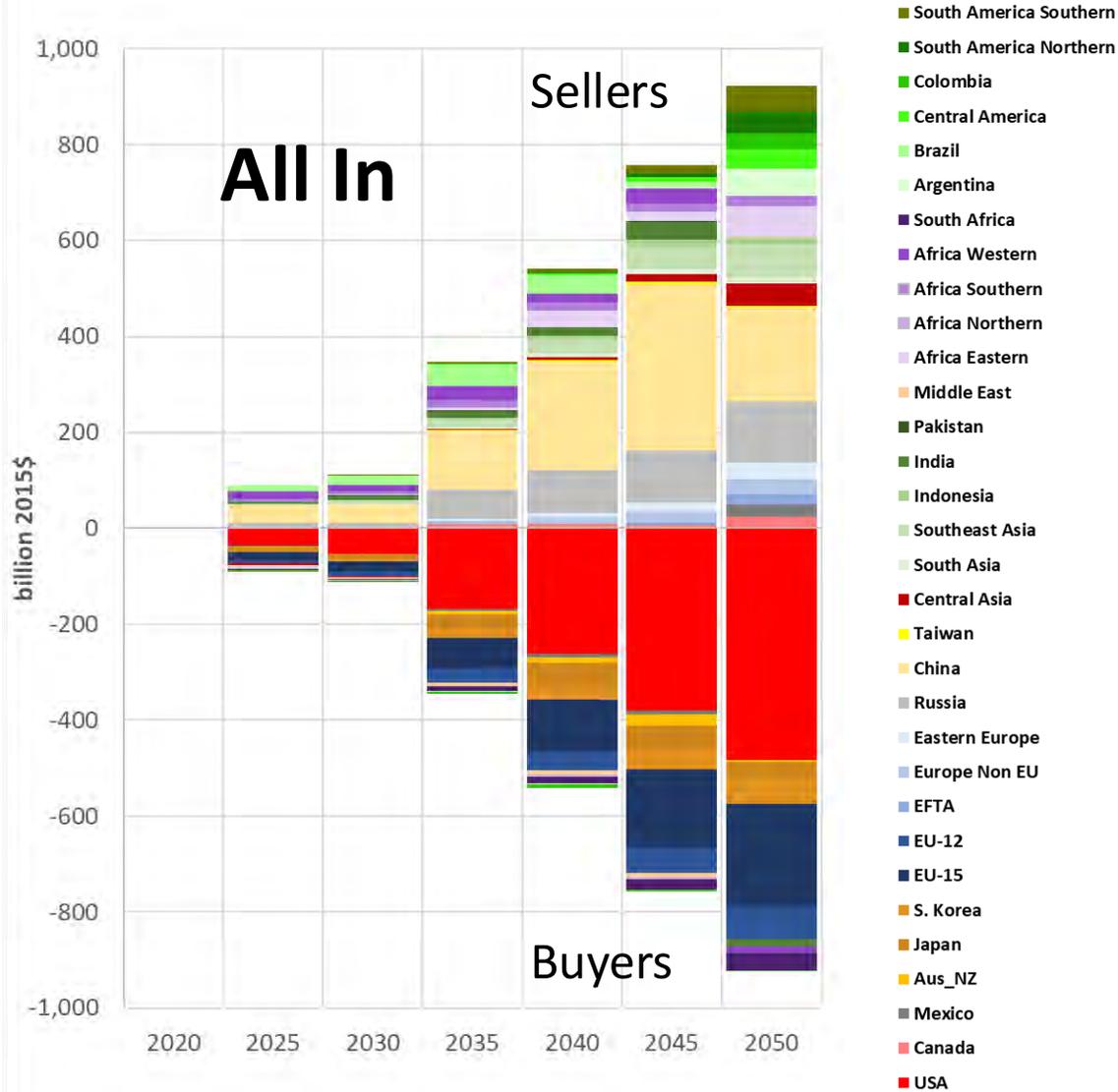
Cumulative \$3.2 trillion 2022 to 2050

Dropping Any Individual Country Leaves the Market Largely Intact But Reduces Mitigation Incentives for the Country that Mitigates Independently



Carbon Markets with and without the U.S.A

\$



U.S. CO2 Price jumps from \$27/tCO2 to \$132/tCO2

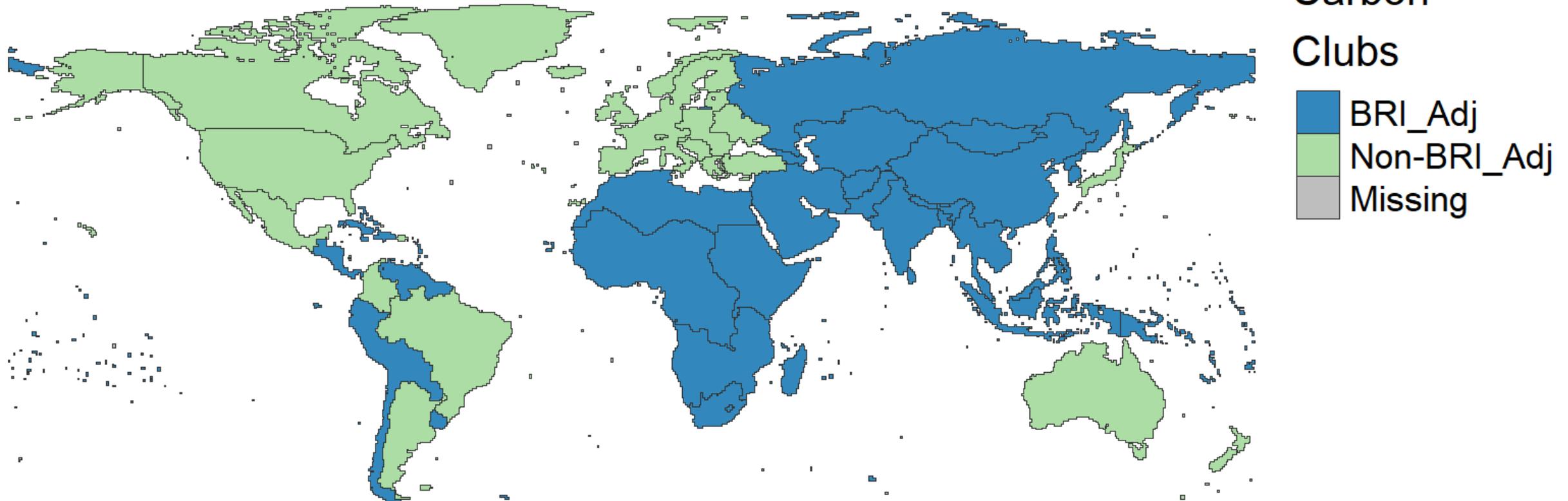
The Club You Join Affects Your
Role

Cooperation Clubs Can Provide Gains to Participants

A Hypothetical Club Based on China's Belt and Road Initiative (BRI)

Carbon Clubs scenario

Adjusted BRI & Non-BRI



Comparison of Global Cooperation to A Hypothetical Club Based on China's Belt and Road Initiative (BRI)

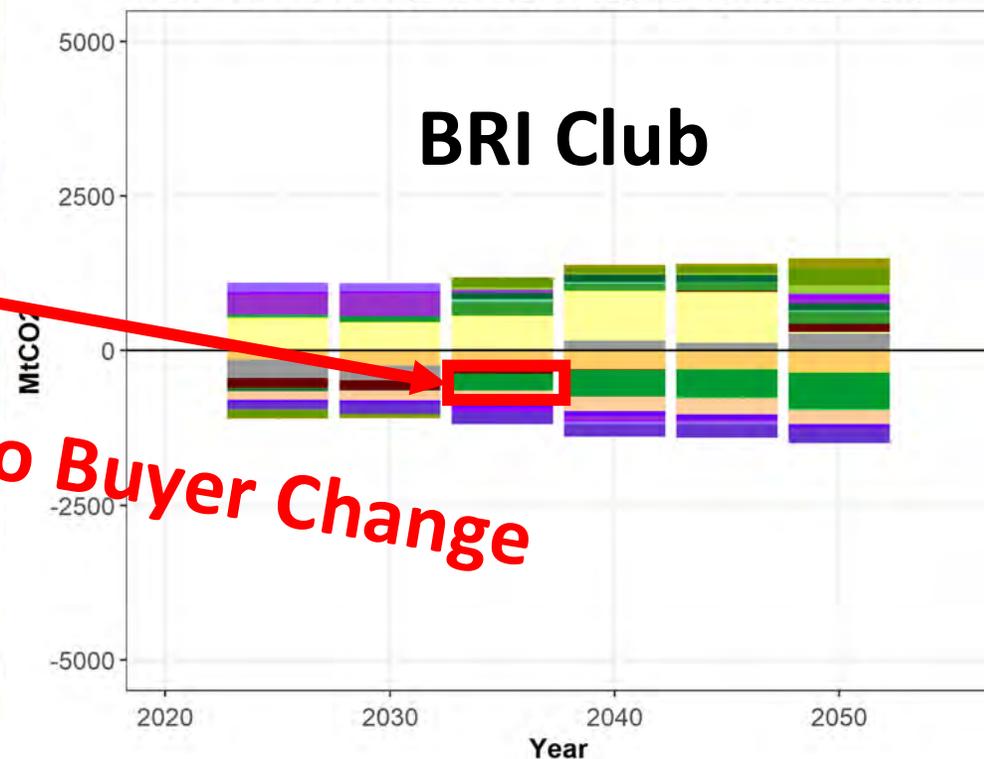
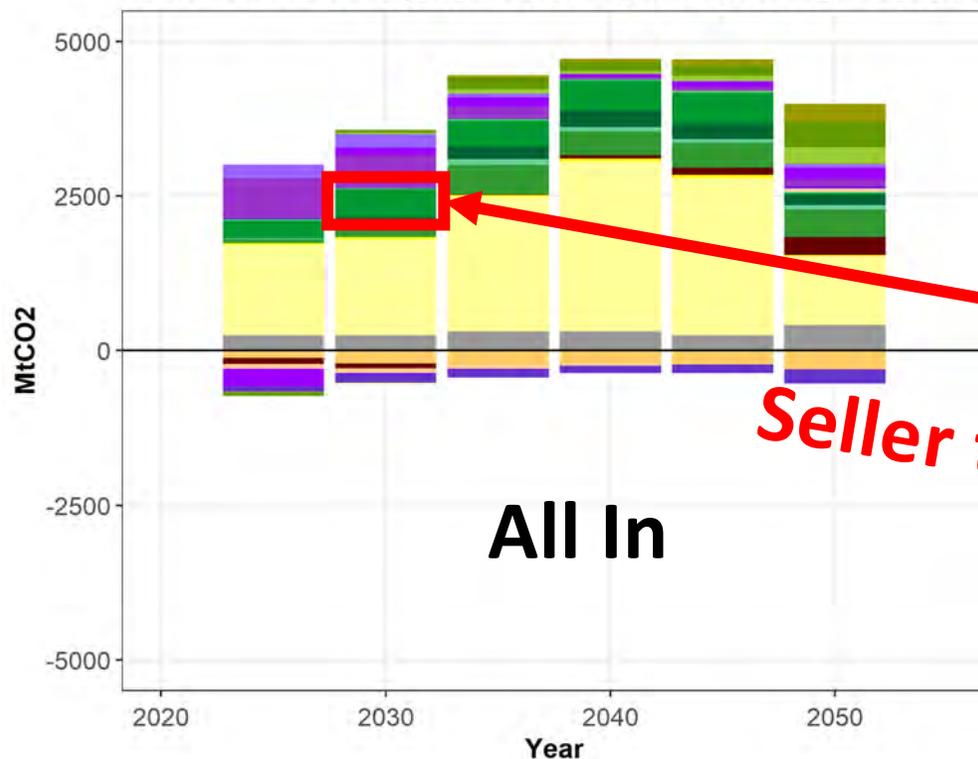
BRI Regions ITMO Transactions with Global Cooperation

BRI Regions ITMO Transactions with BRI-ONLY Cooperation

CO₂

Trade Flows in Adjusted BRI Regions (MtCO₂) - Global

Trade Flows in Adjusted BRI Regions (MtCO₂) - Club

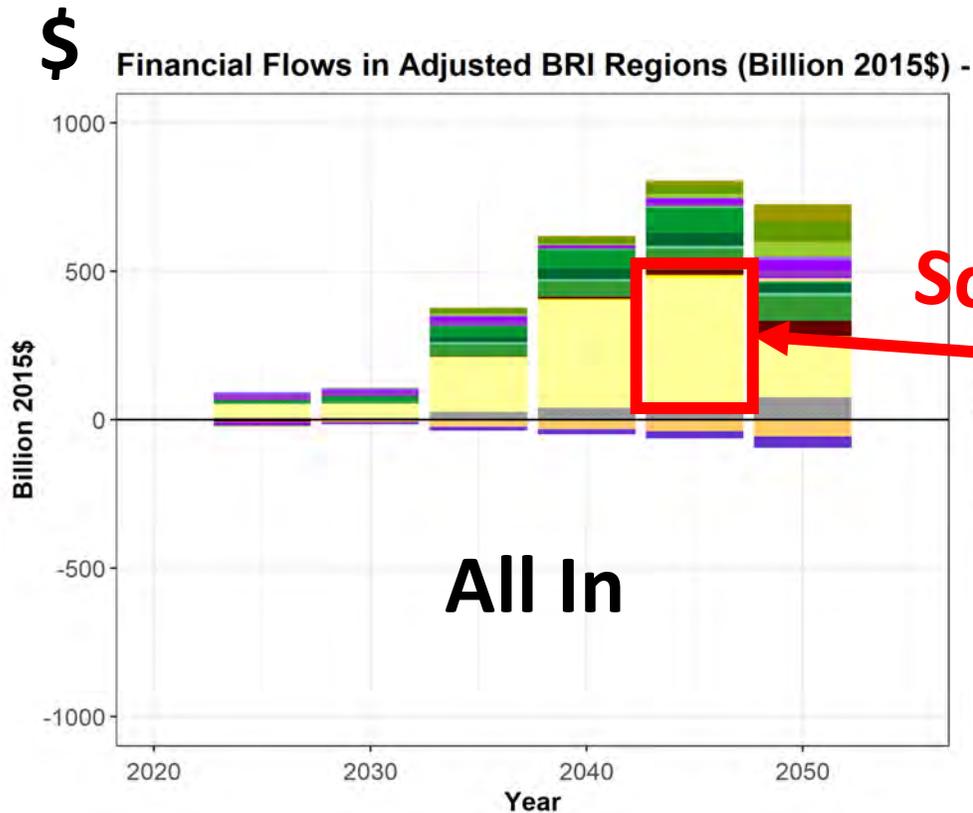


- South America_Northern
- South America_Southern
- Central America and Caribbean
- South Africa
- Africa_Southern
- Africa_Eastern
- Africa_Western
- Africa_Northern
- Middle East
- Pakistan
- India**
- Indonesia
- South Asia
- Southeast Asia
- Central Asia
- Taiwan
- China
- Russia
- South Korea

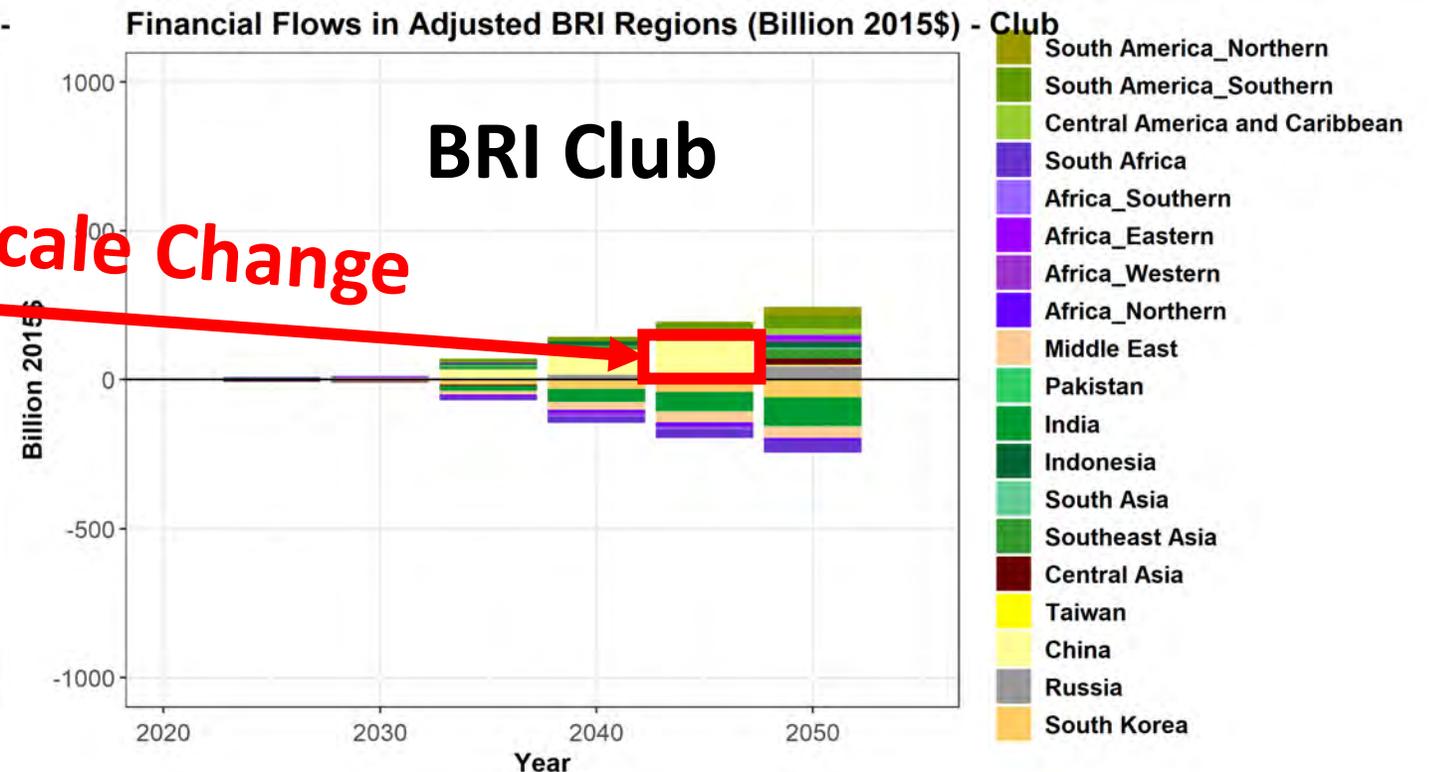
Seller to Buyer Change

Comparison of Global Cooperation to A Hypothetical Club Based on China's Belt and Road Initiative (BRI)

BRI Regions Financial Transactions with Global Cooperation



BRI Regions Financial Transactions with BRI-ONLY Cooperation



Key Messages

- **Article 6 holds enormous potential for enabling Paris ambition.**
- Countries that continue to cooperate using Article 6 continue to benefit even when a large emitter does not participate.
- The club you join will affect how a country benefits from cooperative emissions mitigation.
- Local design is important, e.g., SDG achievement (to be documented).

Future Work

Voluntary carbon markets, NDC achievement, and Global emissions mitigation

- **Motivation:** Voluntary carbon markets have been growing rapidly and induce activities with real-world consequences for the countries in which those actions occur, other countries connected in the global energy network, international financial transfers and for the Earth's climate.
- **Proposal:** We propose to investigate these interactions for a hypothetical, stylized, voluntary carbon market, to be determined.

Future Work

Possible Hypothetical Stylized Voluntary Carbon Markets

- **Power Sector:** Power sector in a country, e.g., U.S., takes on a voluntary commitment that is more aggressive than implied by the resident country's NDC. Power sector achieves emissions mitigation through both reduced emissions and purchased offsets.
- **Fuels Sector:** Producers of fuels, e.g. refineries, commit to purchase offsets to cover X% of the associated emissions associated with downstream fuel use.

Discussion

Panel

Views from the negotiating room – What to expect for carbon markets in 2023 and beyond, and how analysis may help

Maria Jishi, Saudi Arabia

Martin Hession, European Union

MJ Mace, AOSIS

Piotr Dombrovicki, Poland

Moderator: Andrea Bonzanni, IETA

Discussion

CLOSING REMARKS

- Dirk Forrister, IETA
- Jae Edmonds, UMD/PNNL



THANK YOU

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