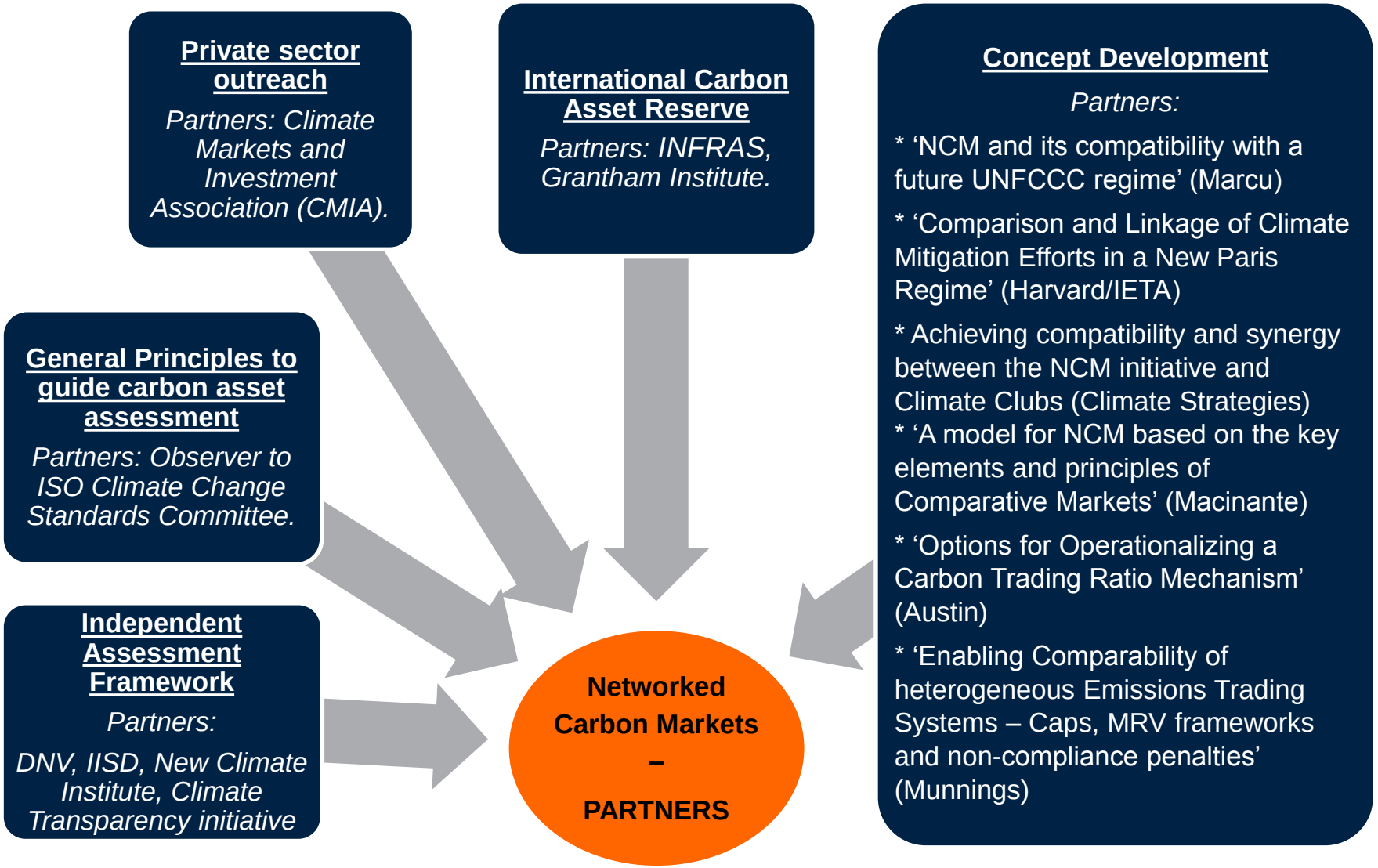
WORLD BANK GROUP
Climate Change

The Networked Carbon Markets Initiative

November 2015

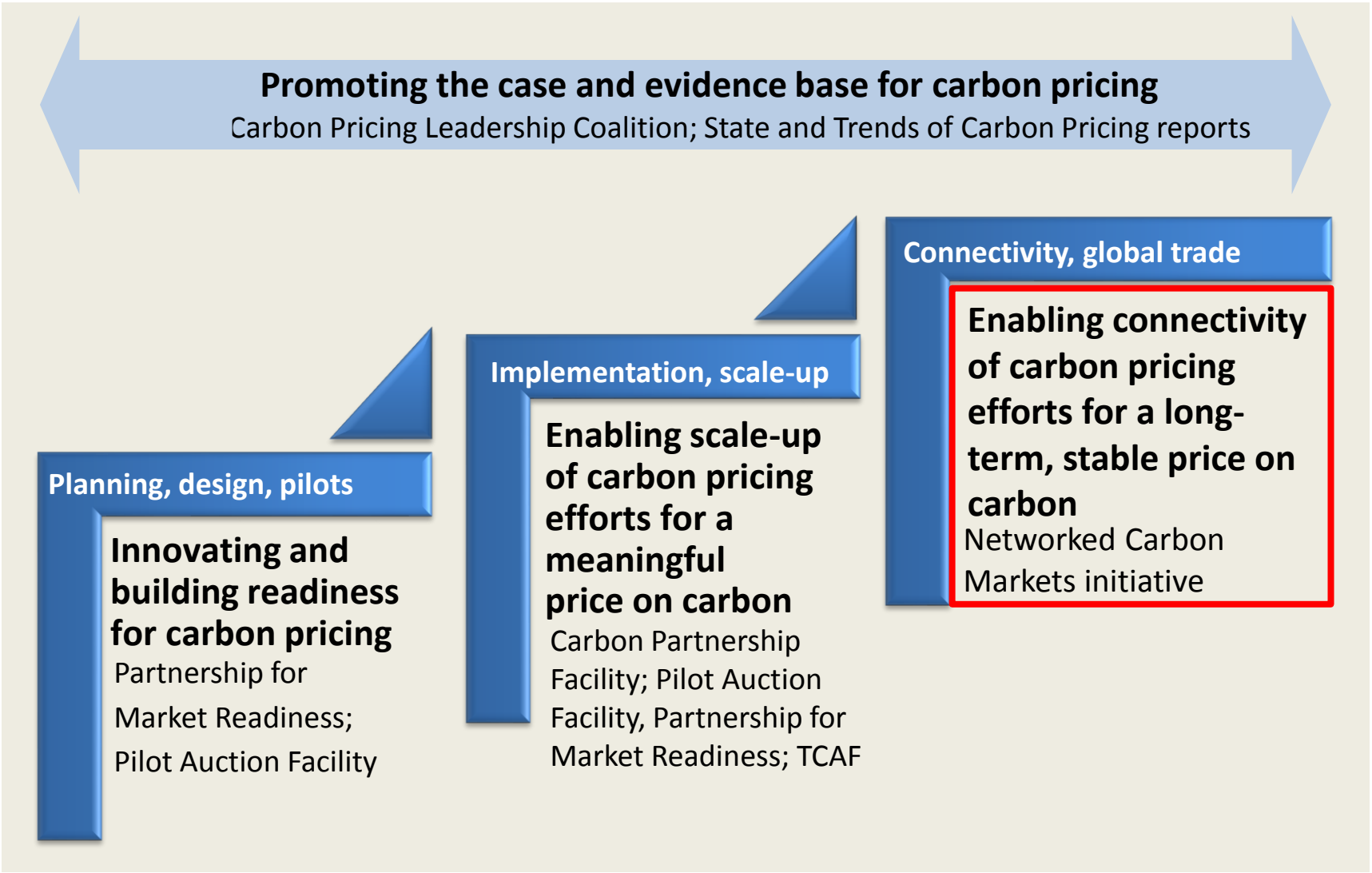
The Networked Carbon Markets (NCM) initiative is collaborating with a wide range of partners to progress its technical and analytical work plan



Agenda

Background and assumptions	4
‘Mitigation Value’ and environmental integrity	10
Trading rules and instruments	14
Institutions and Governance Structures	18

The NCM initiative is a key component of the WBG's long term carbon pricing efforts



Underlying assumptions

A linked international carbon market is desirable

Governments and market participants need information about the schemes that they link with and the carbon assets that are imported

Governments should have the sovereignty to act responsibly on the information **about the schemes that they link with and the carbon assets that are imported**

Different forms of linking climate actions

Form of Linking	Definition
Full	Compliance unit in one jurisdiction is accepted without restriction in the “linked” jurisdiction
Limited	Compliance unit in one jurisdiction is accepted with qualitative/quantitative restrictions in the “linked” jurisdiction
Indirect	Markets are not linked directly, but have access to the same third carbon market.
Networking	Fungibility of carbon assets across schemes facilitated by risk-based assessment and discounting.

Key components of the NCM initiative

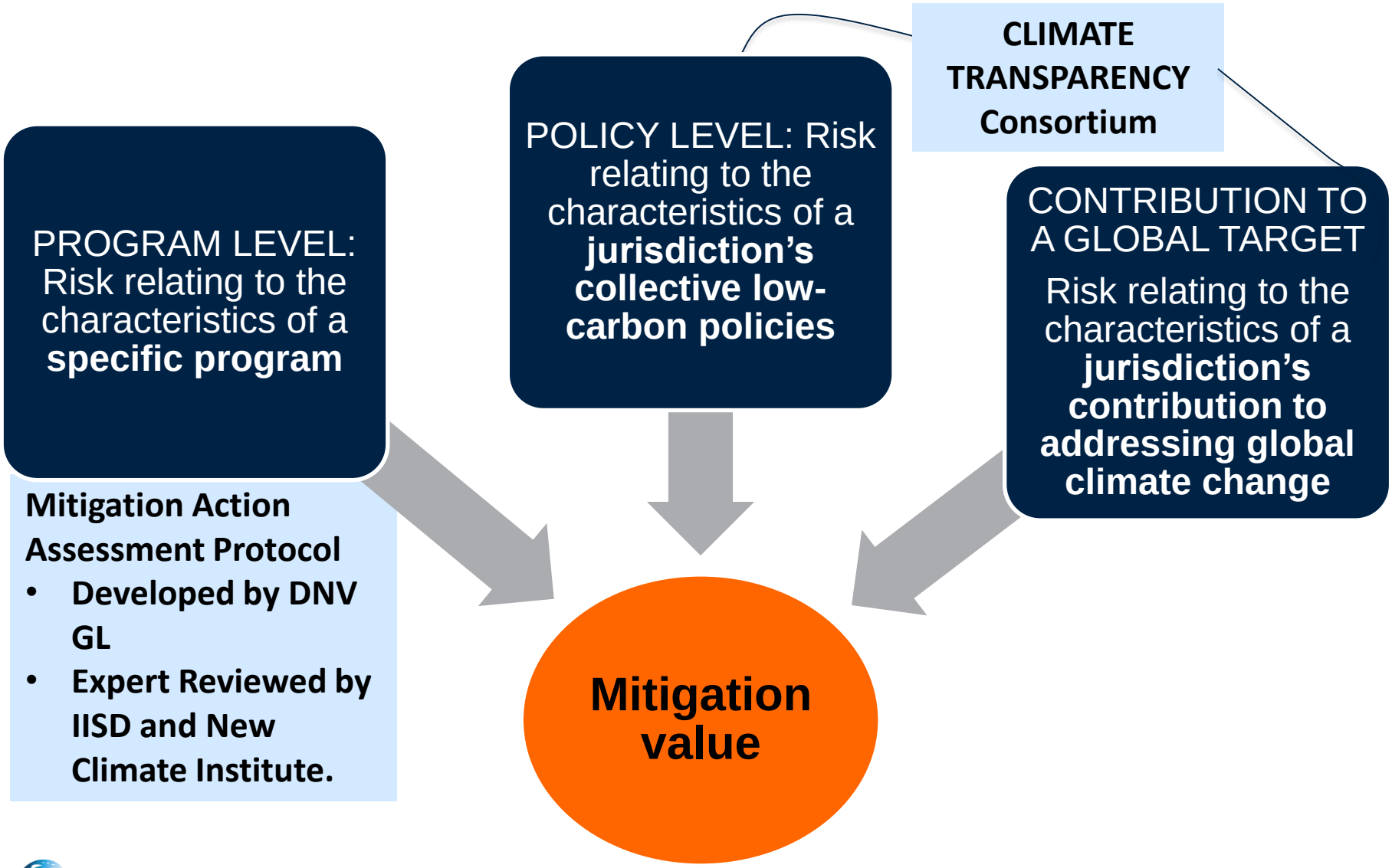
1. **Independent assessment framework** to determine the **climate change mitigation value** of different climate actions and enable their fungibility in the international market.

2. **International Carbon Asset Reserve** to support and facilitate carbon market related functions.

3. **International Settlement Platform** to track cross-border trades and possible clearing house function.

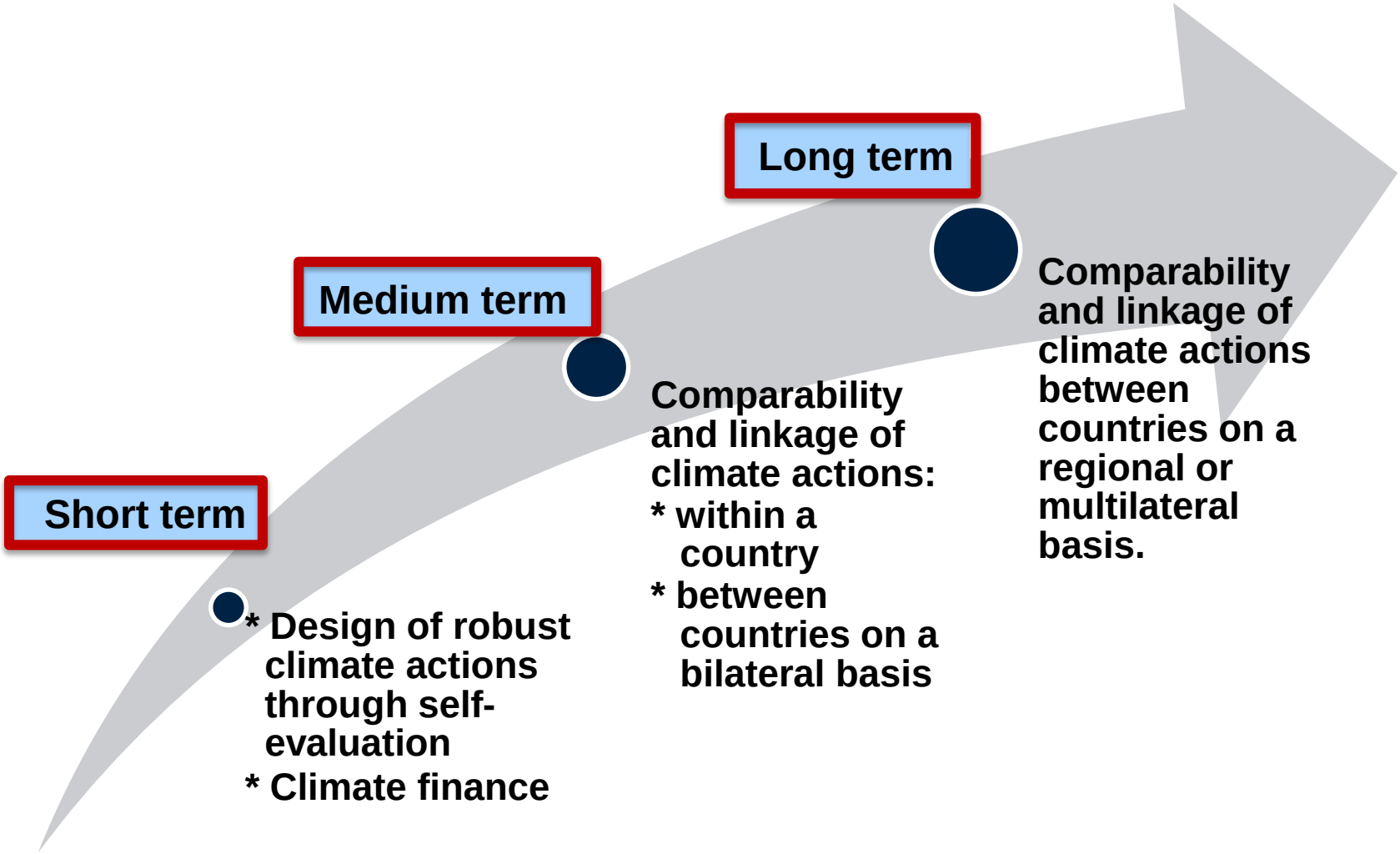
WORLD BANK GROUP
Climate Change

Types of Mitigation Value Assessment



WORLD BANK GROUP Climate Change

The 3 key components of the NCM initiative are to be introduced in a phased manner

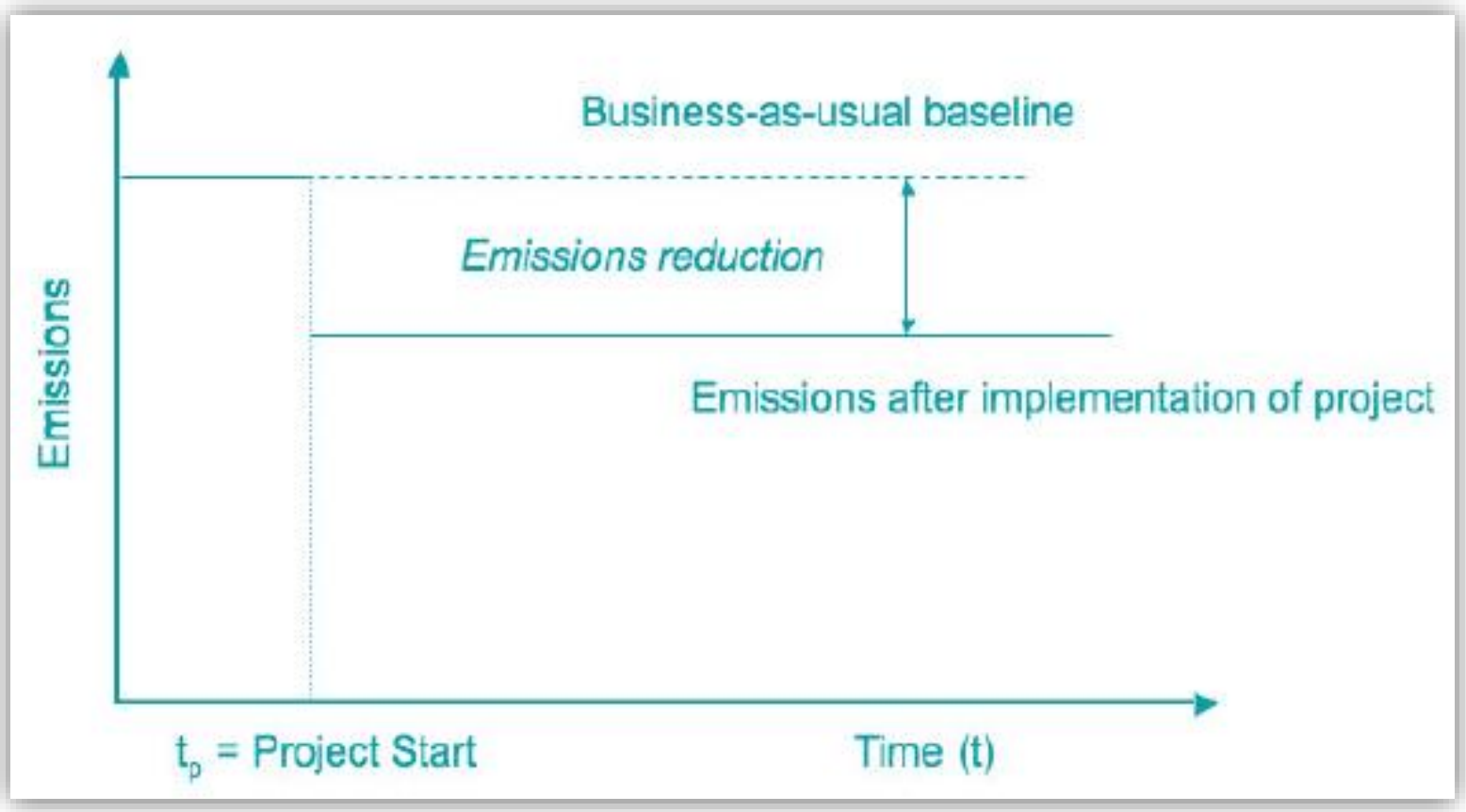


WORLD BANK GROUP
Climate Change

Agenda

Background and assumptions	**4**
‘Mitigation Value’ and environmental integrity	**10**
■ Offsets ■ Allowances	
Trading rules and instruments	**14**
Institutions and Governance Structures	**18**

Valuing carbon offsets versus a counterfactual scenario



Carbon allowances – a right to emit 1 tonne of CO2

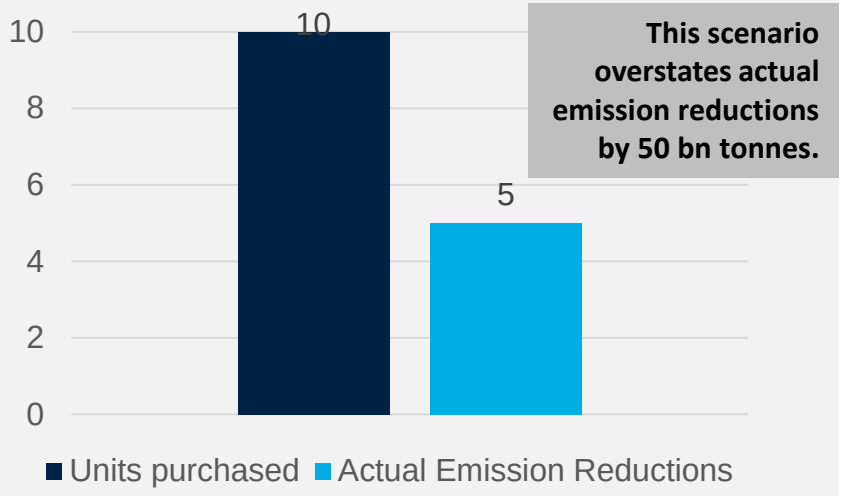
Entity 1 reduces so has surplus allowances available

Entity 2 does not reduce so it purchases Entity 1's surplus allowances

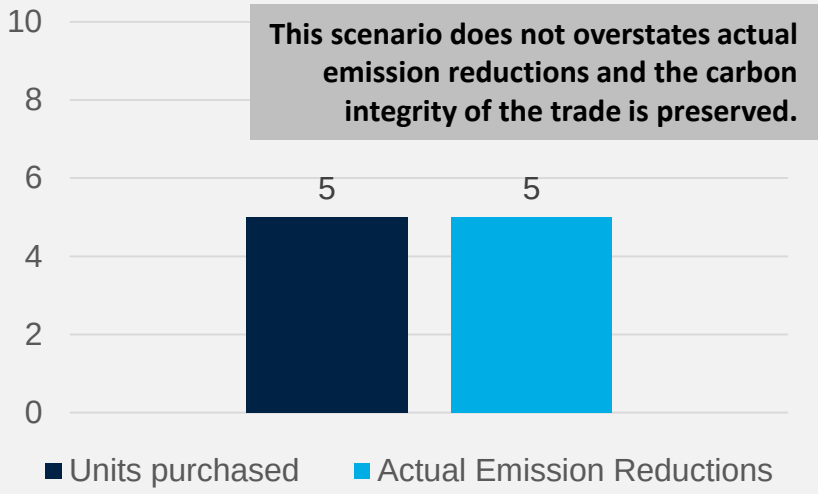
How Mitigation Value protects the environmental integrity of trade of carbon allowances

Scene: 10 million x 'Country A' carbon allowances are purchased by Country B. The actual mitigation value of each 'Country A' asset is 0.5 tonnes.

Scenario 1: The actual mitigation of Country A's carbon assets are not accounted for in the trade



Scenario 2: The actual mitigation of Country A's carbon assets are accounted for in the trade



Mitigation Value is intended to preserve the environmental integrity of the trade.

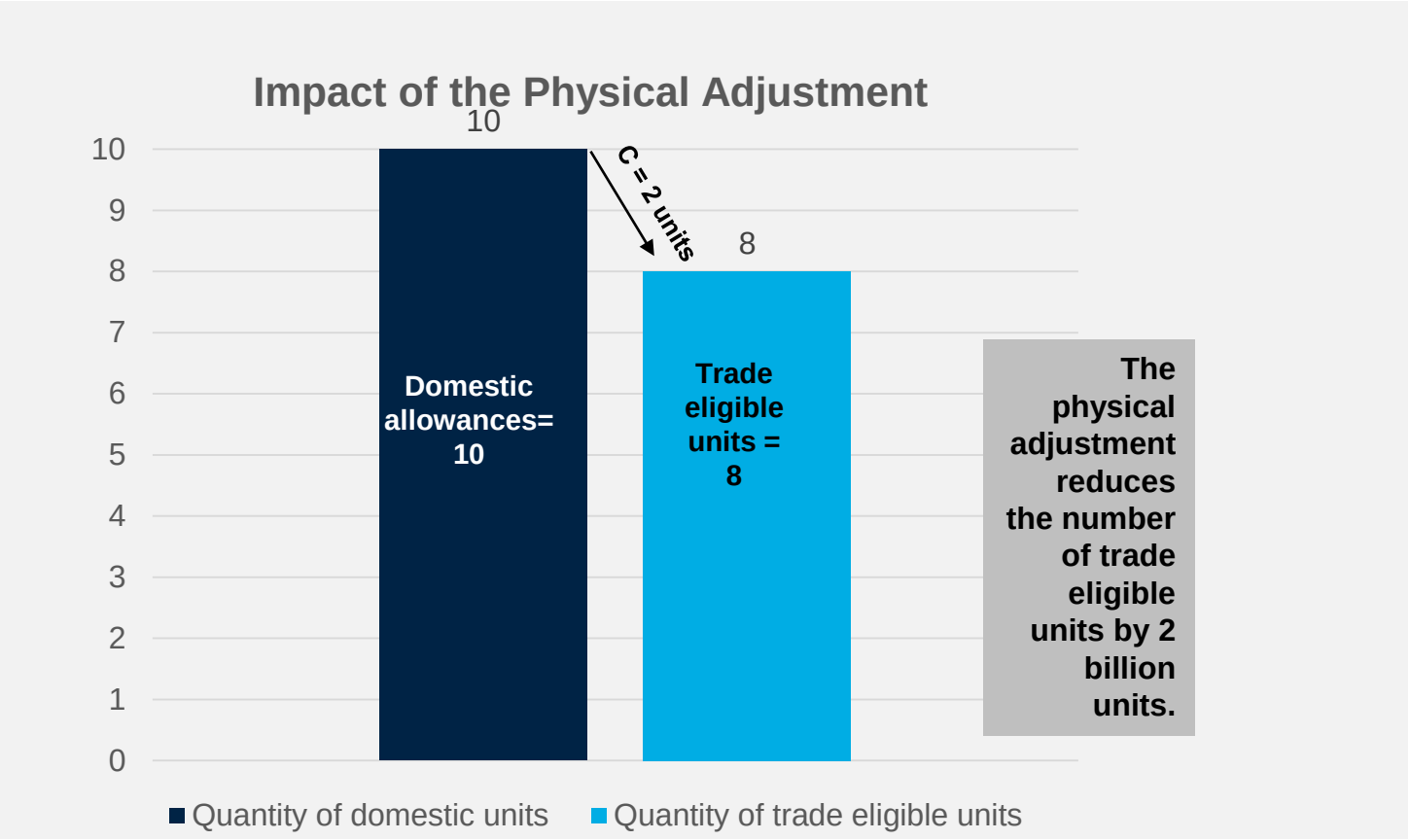
WORLD BANK GROUP
Climate Change

Agenda

Background and assumptions	4
‘Mitigation Value’ and environmental integrity	10
Trading rules and instruments	14
Institutions and Governance Structures	18

Addressing the windfall sales opportunity that might arise from over-allocation of allowances

Scene: 'Country A' over-allocates by 2 million tonnes.



WORLD BANK GROUP
Climate Change

Using Mitigation Value to facilitate trade of 'trade eligible units'

- Mechanics: How to translate rating into rates?
- Governance:
  - Who sets the rates? Use of a central aggregator or reserve?
  - What is the role of Compliance Value? What is the role of regulators versus market participants?
- Frequency: What is the frequency at which they should be set?
- Lessons learned: what can we learn from other environmental and financial markets that use trading ratios?

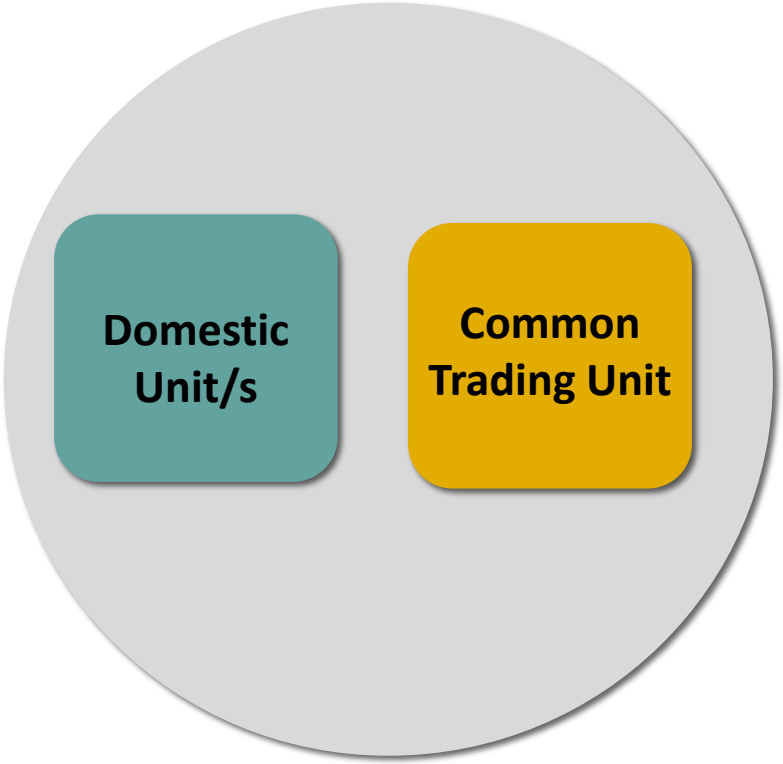
WORLD BANK GROUP
Climate Change

Carrying out the transaction

Country A

Jurisdiction chooses to trade without a common trading unit

Country B



With an International Transaction Unit

Agenda

Background and assumptions	**4**
‘Mitigation Value’ and environmental integrity	**10**
Trading rules and instruments	**14**
Institutions and Governance Structures	**18**

- International Carbon Asset Reserve (ICAR)
- International Settlement Platform
- Carbon Clubs

International Carbon Asset Reserve

An International Carbon Asset Reserve could provide functions that help manage certain market risks and market failures, in conjunction with jurisdiction-level mechanisms:

- Provide a source of liquidity;
- Provide a back-up for domestic reserves;
- Provide a market maker function.

WORLD BANK GROUP
Climate Change

International Settlement Platform

- The settlement platform would need to be linked to the scheme registries of the participating jurisdictions.
- The settlement platform could either incorporate or be linked to a central registry tracking the movement of carbon assets between jurisdictions
- A central registry could also facilitate an audit mechanism for crosschecking the individual scheme registry holdings.

WORLD BANK GROUP
Climate Change

Governance Structures – 'Climate Clubs'

Possible case studies:

- Western Climate Initiative:
- Asia-Pacific Forum: Incipient arrangement among small island states that are highly vulnerable to climate change.
- ICAO: The ICAO has recently agreed to develop a voluntary market-based-mechanism (MBM), but the details are not to be decided until 2016 and not in force until 2020.

Conclusion

Background and assumptions	4
‘Mitigation Value’ and environmental integrity	10
Trading rules and instruments	14
Institutions and Governance Structures	18

MITIGATION VALUE

Presentations by:

- ***Andrei Marcu***, Senior Advisor, CEPS Carbon Market Forum (via Webex)
- ***Johannes Heister***, GENDR, World Bank Group

Value of Units in a Networked Carbon Market

November 12, 2015

World Bank

Andrei Marcu

Carbon markets 1.0

- Currently carbon markets are
  - UNFCCC level – Art 17, CDM, JI
  - Domestic: EU ETS, NZ, Quebec- California
- Linkages: linked jurisdictions are inside or outside the KP club
  - Quebec/California outside KP
  - EU/Australia inside KP
- Difference exist but
  - KP membership forces conformity (AAUs provide back stopping)
  - Non KP
    - Small numbers
    - Have created a “club” joined by new members
    - Have jointly negotiated the rules of the club

Carbon markets 2.0

- Markets will develop in a more heterogeneous way as the global climate change agreement will provide little or no glue
- The in/out of the international agreement will cease to exist as everyone will be part of the new CC agreement
- In addition to existing markets new ones are expected to emerge through the PMR
- Multiple models of carbon pricing will emerge

Carbon Markets 2.0

- Differences exist and will continue, with respect to
  - Cost containment, including offset types and quantity
  - MRV
  - Third party verification
  - Carbon leakage provisions
  - Demand/Supply flexibility
  - Penalties for non compliance
- Most difficult to asses level of effort in two jurisdictions

Carbon Markets 2.0

How will global markets evolve and emerge?

- A linked system through a UNFCCC framework (Art 17 of KP)
- A “snowball” approach where systems join a critical mass: possibly multiple clusters
- A “docking station” evolution where a dominant system emerges
- A ”club” approach where the initial members negotiate terms and benefits and those that join late are “takers”

Two methods can be envisaged

- Negotiate terms of linkage to eliminate differences
- Accept differences, recognize then by assigning value

Carbon Markets 2.0

- Negotiate to eliminate differences- that is a “classic “ linking approach
- Effort to ensure that the “mitigation” value of a unit is the same in all linked systems
- Under some market evolution scenarios number of combinations can be large
- Economies can be different and negotiating levels of effort complex
- Economic conditions may change and require renegotiation

Carbon markets 2.0

Question:

Negotiate differences away

OR

Recognize them and assign value based on differences

Value of Units

- Units can have 3 values
  - Mitigation value
  - Compliance value
  - Financial value
- **Compliance Value**: set by Regulator. This is a regulatory markets and the regulator decides
  - What is good for compliance
  - What Compliance Value does a unit have under its jurisdiction
- **Regulators**:
  - Subnational (California/Quebec)
  - National (UK, ROK, De, Fr, etc)
  - Regional (EU)
  - Global (COP)

Value of Units – Mitigation Value

- MV is **relative** value vs. a standard
- Does **NOT** refer to the **atmospheric impact** of 1 ton of CO2e reduced – that is constant
- MV can be seen as having two components
- One in which MV can be defined as:
  - The level of effort that a ton reduced in a jurisdiction is worth relative to another jurisdiction
  - Value that stakeholders attached to the reduction of a ton in jurisdiction in terms of what it thinks that jurisdiction should do to reduce GHG

Value of Units – Mitigation Value

- MV can be function of a number of factors
  - The level of effort promised and undertaken
  - Characteristics of the economy
  - Characteristics of the program
  - Resources available for mitigation
  - Capacity to undertake mitigation
- Component 2 - MV can be seen as probabilistic: probability that a unit of reduction in a jurisdiction (e.g. credit issued) represents 1 ton of CO2e

Value of Units – Mitigation Value

- There are 3 levels of risk
  - Program level
  - Jurisdiction level
- Mitigation value can be determined by
  - Regulator (and CV likely set CV=MV)
  - Any entity (e.g. rating agency)
- MV can change e.g. AAUs, HFC CERs, EUAs
- MV & CV can be
  - Binary
  - Risk adjusted

Value of Units – Financial Value

- Financial value is set by the market function of
  - Demand/Supply
  - Liquidity
  - MV/CV relationship. If different, there is the expectation of a regulatory intervention with FV implications

Linked & Networked Carbon Markets

- NCM one way to create fungibility and global carbon market
- Linking vs. NCM
- Linking implies CV1=MV1=CV2=MV2 through negotiations
- Doable bilaterally or through through a “club” or through snowball/docking station model
- Can be complex to negotiate
- IF MV changes in and ETS, renegotiation is needed

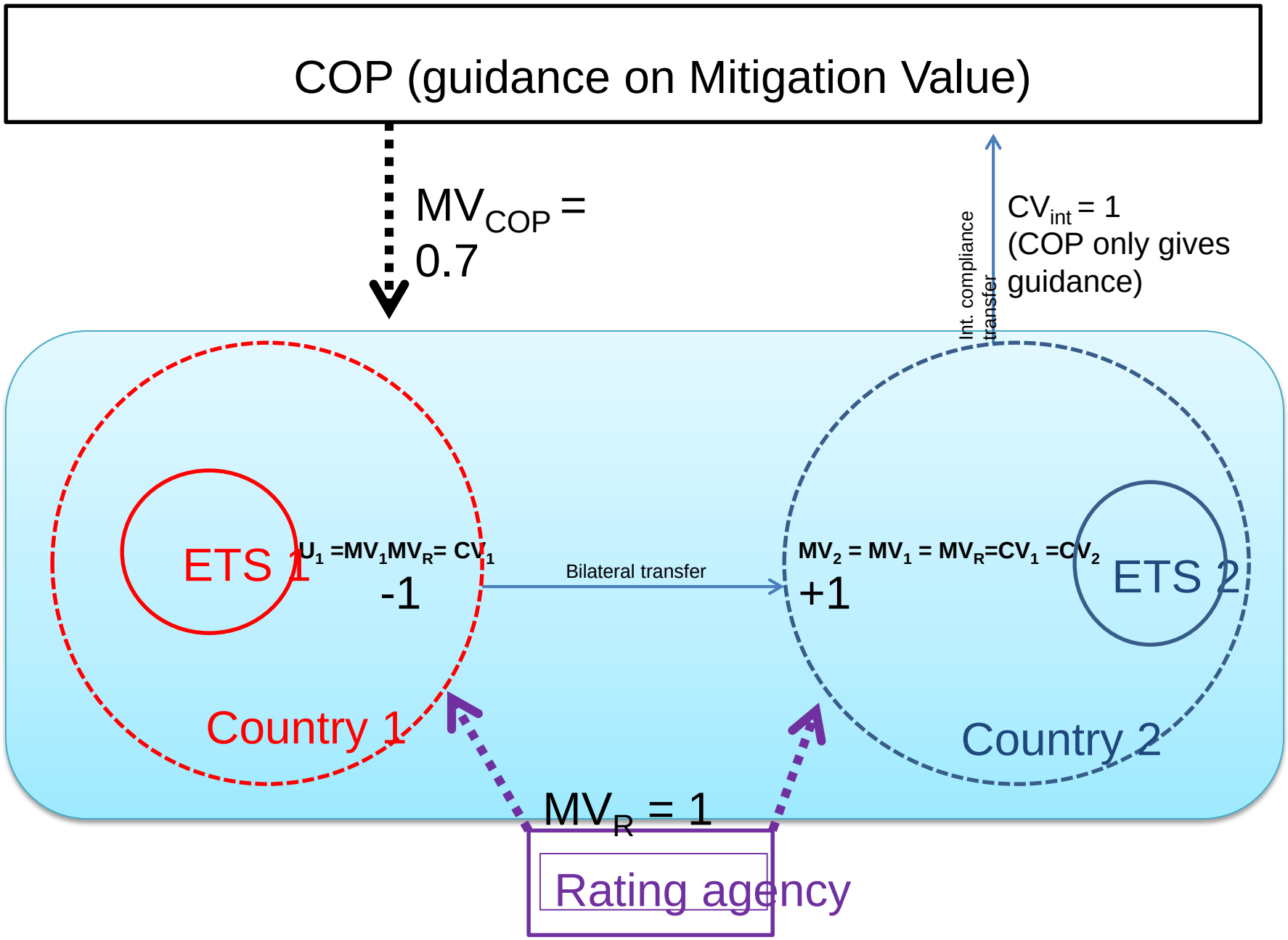
Networked Carbon Markets

- A heterogeneous world
- A changing, globalized a world where competiveness is an important driver
- Value of units from different jurisdiction will be different
- NCM is driven by relativity in value (MV) between units from different jurisdictions
- The regulator puts the CV equal the determined MV

NCM & UNFCCC CC regime

Scenario 1: Decentralized UNFCCC, no international guidance for CV for domestic units transferred internationally

- No impact, no overlap
- International CV is set by the user
- MV_{NCM} rating of a unity becomes the international CV of any domestic unit transferred Internationally
- Rating can be done by multiple rating agencies
- A “club” can ne formed that will determine who rates



Both countries accept that $MV_R = CV$

NCM & UNFCCC CC regime

Scenario 2: Decentralized with guidance on MV

- COP provides some guidance on what is good for compliance with INDCs
- Expressed in terms of environmental quality
- Possibly translatable into an MV_{COP}
- No overlap and conflict between COP and NCM
- MV_{COP} could influence the Mvi and with it the FV

NCM & UNFCCC CC regime

Scenario 3: Decentralized, guidance must be observed, no approval

- No direct overlap between COP and NCM
- Issuer/user of international units may need to observe transparency requirements
- Possible peer review
- COP provide stronger direction on how to determine the MV
- Has stronger impact on how $M_{i\ is}$ determined and on the FV

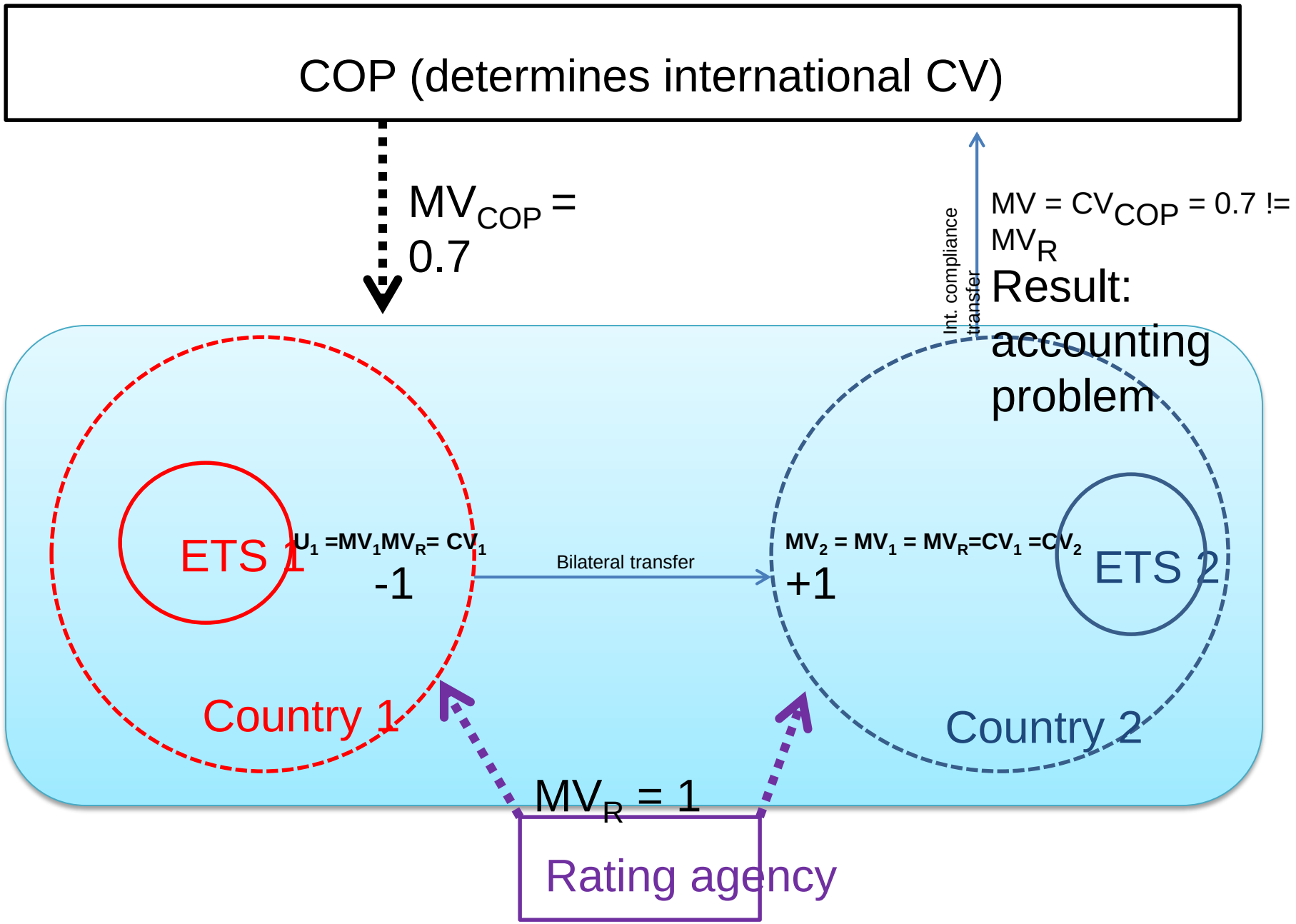
NCM & UNFCCC CC regime

Scenario 4: Centralized UNFCCC governance, COP assigns CV to international units

- There is a qualifier: INDCs that have EWC could choose to assign any international CV for domestic units transferred as they could guarantee this through their budgets
- There is overlap between UNFCCC and NCM
- In NCM $CV_{NCM}=MV_{NCM}$
- Can result in accounting discontinuity if $CV_{COP}=CV_{NMC}$

NCM & UNFCCC CC regime

- An NCM inside the UNFCCC regime is possible but requires that accounting between the NCM “bubble” and the UNFCCC be synchronized
- The UNFCCC accounting what the “bubble” will show at the end of the periom



Both countries accept that MV_R = CV

End of presentation

Thank you for your attention

Operationalizing Mitigation Values

Mini-Seminar on Networked Carbon Markets
12 November 2015

Johannes Heister

Three stages, two time points of MV assessment

- Global carbon budget versus national ambition
- National emission targets versus sector-wide (or ETS, crediting) targets
- ETS, crediting targets versus MRV

- Ex ante
- Ex post

MV assessment anchor

- MV assessment should be anchored in the global target GHG emission target.
- Rationale 1: International carbon markets should operate under the assumption of compliance with the global target. This means that traded units must be scaled down proportionally to a level that is compatible with the global target.
- Rationale 2: Anchoring MV assessment produces a system of “fixed” exchange rates (compare gold standard in currency markets).

Global mitigation target

- How does the countries mitigation target compare with the global stabilization goal of 2°C?
- Mitigation defined as ability to keep global emissions within the safe limit -> Global Carbon Budget **B**, compared to planned global emissions **P** and actual global emissions **A.**
- Distribute B to countries and time periods -> emission allowances for country *i* in period *j* => $\mathbf{B(b_{it})}$, with $\mathbf{(b_{it})_{nxT}}$ being a matrix of factors for n countries and T periods, the sum of which is 1.
- Calculate the same matrix for each country's planned emissions (based on INDCs): $\mathbf{P=B(p_{it})_{nxT}}$, and for actual emissions (based on MRV): $\mathbf{A=B(a_{it})_{nxT}}$
- Compare factors: ex ante ambition $\mathbf{d_{it}} = \mathbf{b_{it}} / \mathbf{p_{it}}$, ex post result $\mathbf{b_{it}} / \mathbf{a_{it+1}}$ defines a global level discount factor (or bonus) for each country.
- Comparing discounts for two countries $\mathbf{d_{it}} / \mathbf{d_{i+1,t}}$ produces a global level exchange rate between their tradeable units.
- Example: $\mathbf{b_{it}} = 0.3$ and $\mathbf{p_{it}} = 0.6$ -> $\mathbf{d_{it}} = 0.5$ -> i.e. country *i*'s ambition is half of what it should be.
- With $\mathbf{d_{i+1,t}} = 0.25$ the exchange rate is $\mathbf{d_{i+1,t}}/\mathbf{d_{it}} = 0.5$, i.e. 1 unit of country *i+1* exchanges for 0.5 units of country *i* (relative ambition).

National mitigation policy

- What if national mitigation policy leads to different ambitions in carbon trading versus non-trading sectors in a country? What if the trading sector is over-allocated ($\mathbf{P}_{it\text{-}ETS} > \mathbf{A}_{it\text{-}ETS}$, hot air)? Do we care as long as $\mathbf{P}_{it}$ is achieved?
- We could stipulate that effort should be uniform across sectors compared to actual emission $\mathbf{A}_{it}$ (or some other metric) and define an adjustment factor if policy deviates: $x = 1- (\mathbf{D}_{i,ETS}/(\mathbf{A}_{it\text{-}ETS} - \mathbf{P}_{it\text{-}ETS})$
- Where $\mathbf{D}_{i,ETS}$ is emissions quantity that should be, but is not required to be, reduced in ETS sectors.
- Example: $\mathbf{A}_{it\text{-}ETS} = 10$, $\mathbf{P}_{it\text{-}ETS} = 6$, $\mathbf{D}_{i,ETS} = 2$ -> $x = 0.5$
- Question: Should units sold increase level of effort?

MRV performance

- The country's MRV arrangements may not be able to accurately measure emissions or reductions for the entire ETS or crediting system or for individual projects.
- This can be addressed (ex ante and ex post) by defining a system-wide MRV deviation (as above for mitigation policy), such that: $\mathbf{D_{i,ETS}} = \mathbf{D_{\textit{it-ETS-pol}}} + \mathbf{D_{\textit{it-ETS-MRV}}}$
- The same approach can be used to address MRV performance issues in individual projects.

Conclusions

- A relatively simple system to determine mitigation values seems possible.
- Normative issues (how to allocate emission targets to countries and time periods) as well as data challenges (baseline emissions, policy impact, performance of MRV system) must be resolved.
- A matrix of discount rates for countries and time periods can be created based on the described discount factors.
- Applying the discount matrix to traded volumes can ensure that the segment of internationally traded emissions / reductions is consistent with the global target.
- A matrix of bilateral exchange rates can be derived and applied to adjust traded units for differences in *relative* ambition, but does not ensure consistency with the global target.

To be continued …

ASSESSING THE MITIGATION VALUE OF PROGRAMS

Presentations by:

- ***Harikumar Gadde***, GCCCF, World Bank Group
- ***Marcos Castro***, GCCCF, World Bank Group

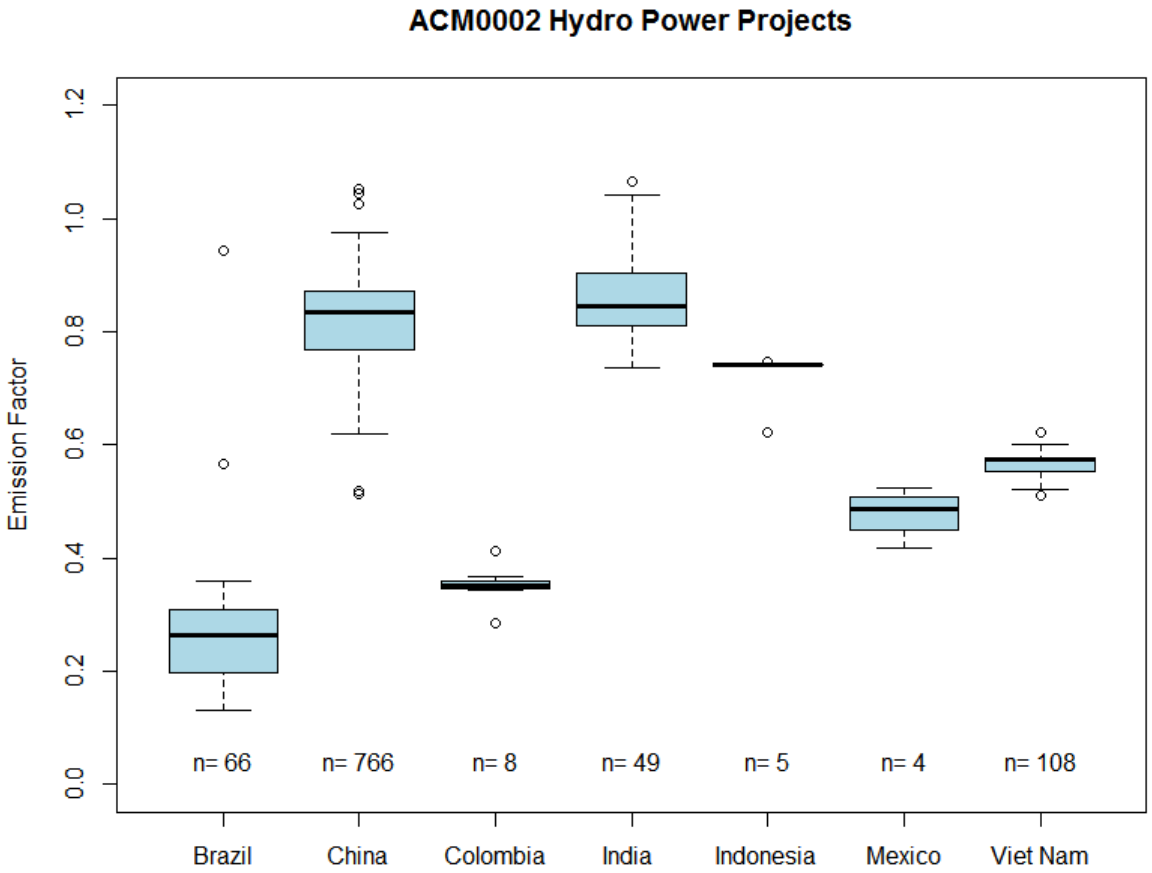
WORLD BANK GROUP
Climate Change

Assessing the mitigation value of programs

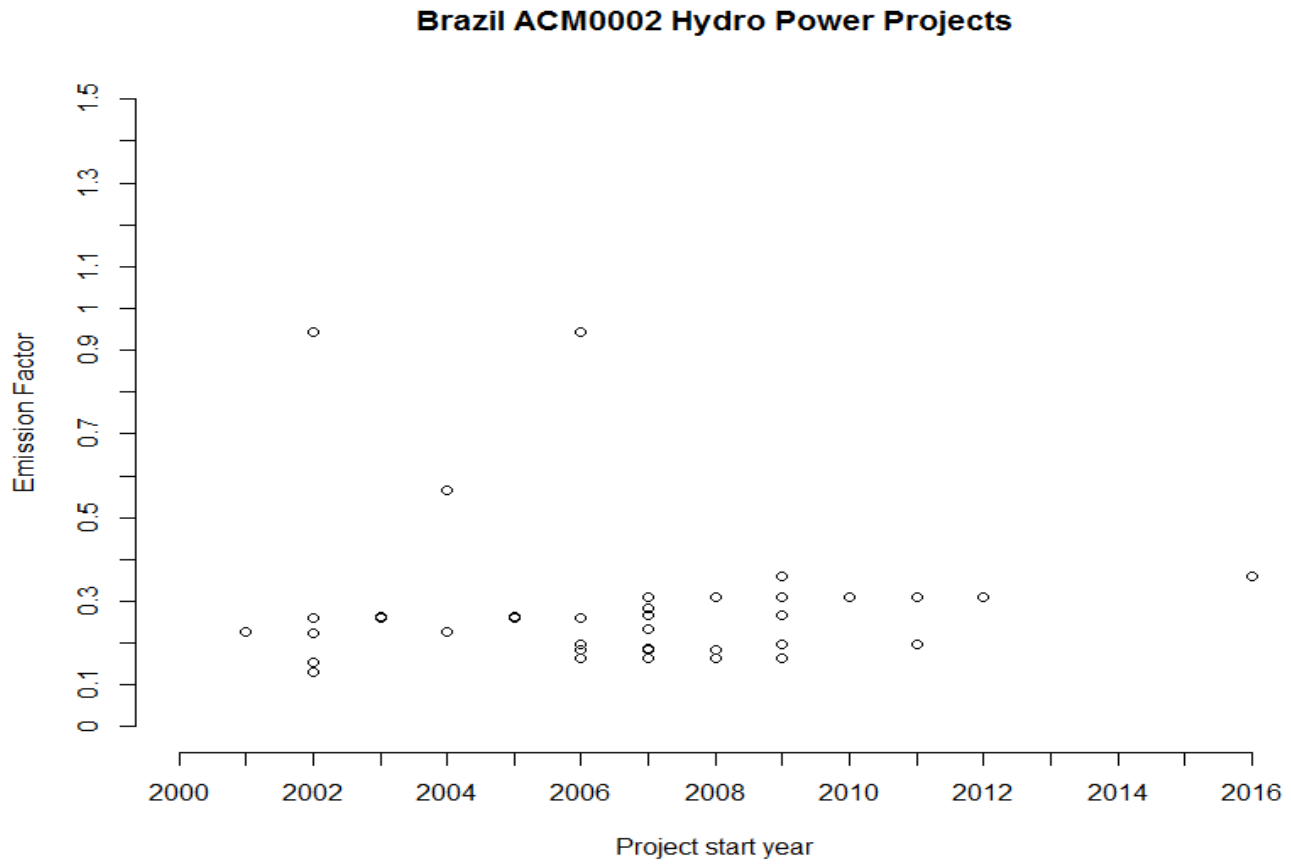
Harikumar Gadde

Nov 12, 2015

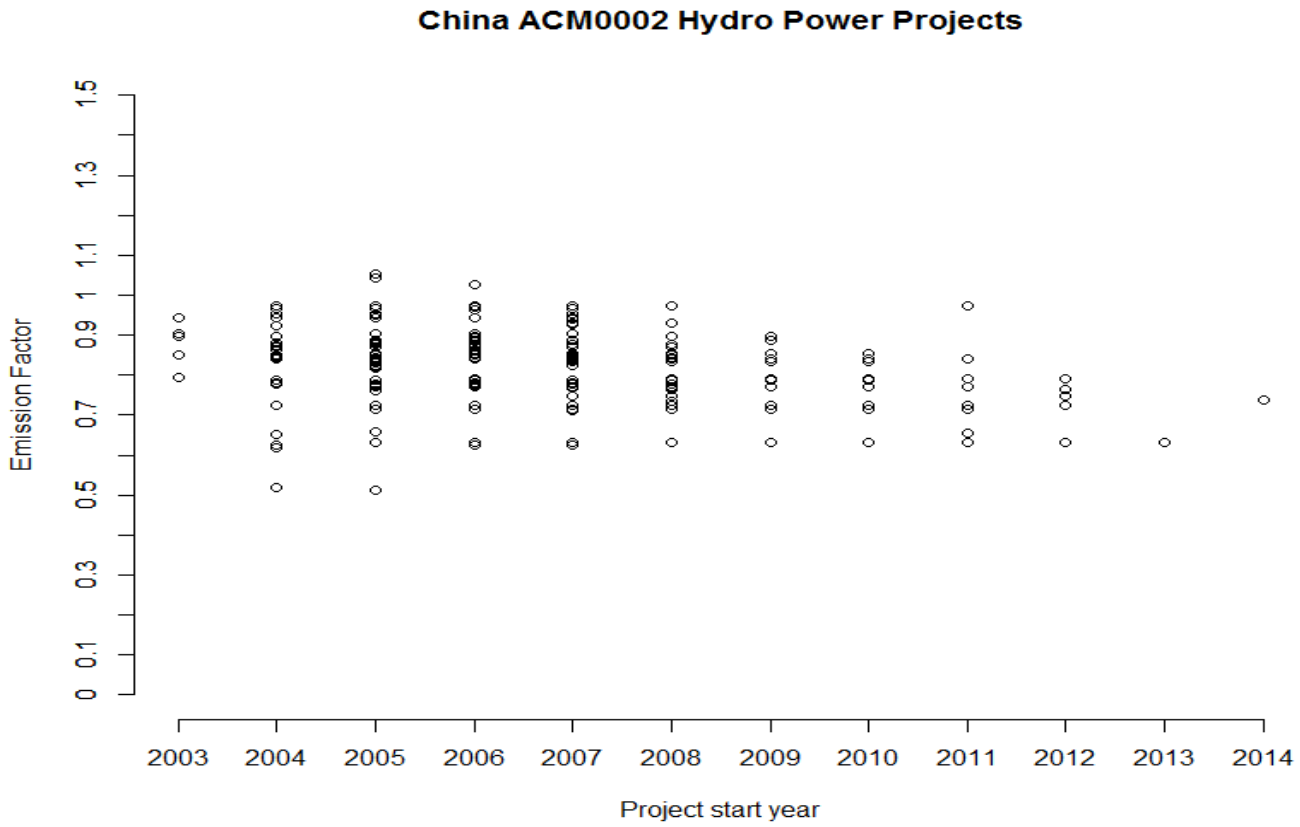
Hydro projects using ACM0002 (for all years)



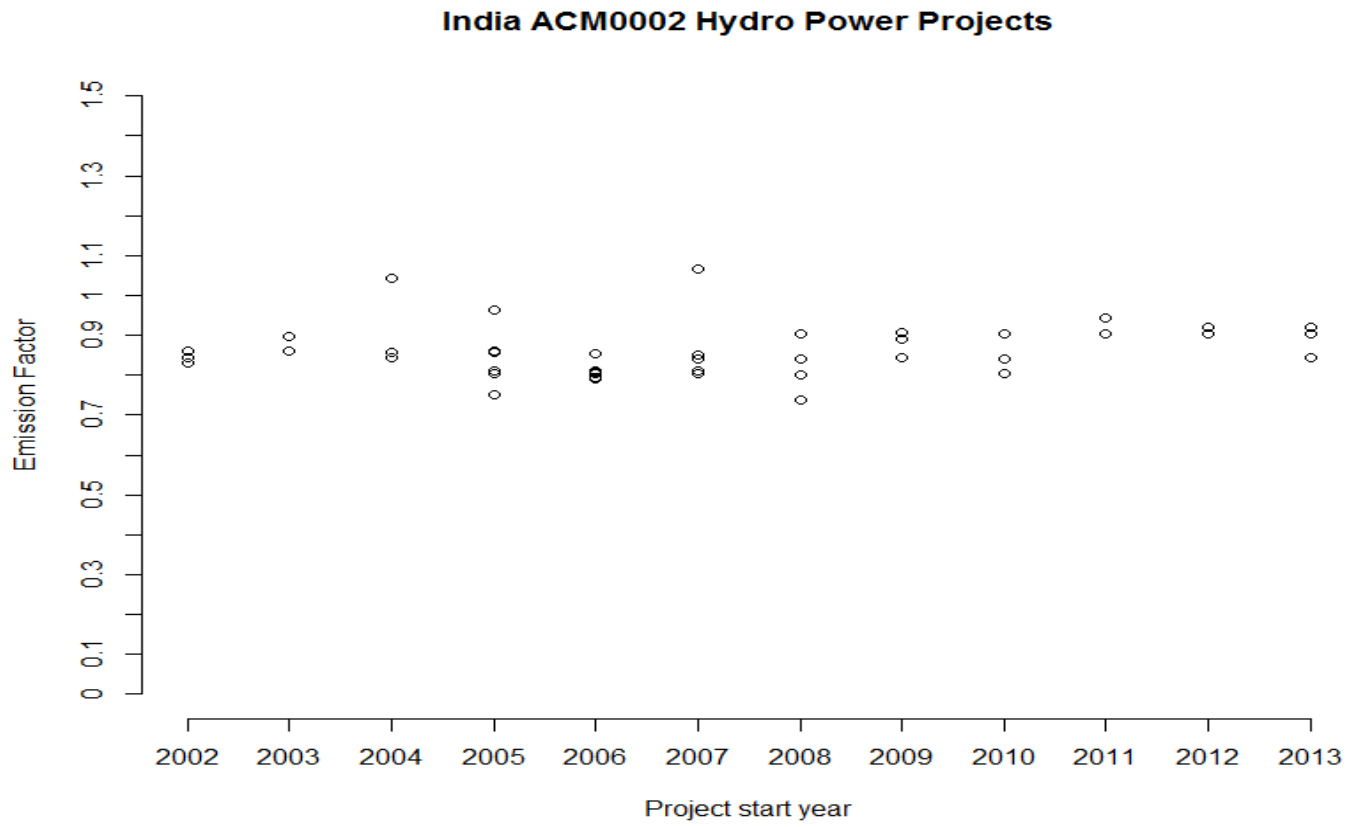
Hydro projects using ACM0002 (Vintage) - Brazil



Hydro projects using ACM0002 (Vintage) - China



Hydro projects using ACM0002 (Vintage) - India



Ex-ante vs Ex-post GEF values

CHINA	100 MW Hydro Project				
	394200 MWh				
North China Grid				tCO_2	
Year	**OM**	**BM**	**CM**	**Ex-ante Fixed**	**Ex-Post**
2007	0.7802	1.0069	0.89355	352,237	352,237
2008	0.7495	0.9914	0.87045		343,131
2009	0.6426	0.9803	0.81145		319,874
2010	0.594	1.0021	0.79805		314,591
2012	0.541	1.058	0.7995		315,163
					7% variation

Ex-ante vs Ex-post GEF values

INDIA	100 MW Hydro Project				
	394200 MWh				
NEWNE Grid				tCO_2	
Year	OM	BM	CM	Ex-ante Fixed	Ex-Post
2007	1.01	0.60	0.81	319,302	319,302
2008	1.02	0.68	0.85		335,070
2009	0.99	0.81	0.90		354,780
2010	0.98	0.86	0.92		362,664
2012	0.98	0.92	0.95		374,490

Factors that impact the GEF value

- **Impact of delineation of the electricity system**
- **BM Data (past vs future)**
- **Inclusion of off-grid data**
- **Data availability and their quality**
- **Challenges with application of time-varying marginal emissions rates to the time-varying output of a CDM project (e.g. dispatch data analysis)**
- **Peak vs baseload plants : more accurate for peak-load reducing projects where peak-load generation is particularly carbon-intensive**

Discussion points

- **Selection of a method depends country circumstances (in this case, power sector situation).**
- **Number of offsets/emission reductions generated is not an issue unless selection of meth linked to say, poor data.**
- **Bringing parity (if one wishes) to tCO_2 generated in different countries might be challenging even if 'common standard principles' are applied (as seen in CDM).**
- **Rating/discounting can be applied if one wants to account accuracy of GEF and account all factors mentioned previously: ex-ante vs ex-post**
- **More work is needed to assess the impact with ex-post monitoring of GEF**

Mitigation Action Assessment Protocol: Concept, prototype and pilot application

Marcos Castro, GCCCF
mcastrorodriguez@worldbank.org

MAAP developed by DNV Kema (commissioned by CF-Assist).
Pilot application facilitated by consortium DNV-UNEP/DTU-SNV Peru (under PMR Peru project).
Slides sourced from reports & presentations prepared under these project activities.

Outline

1. **Introduction, objectives, process**
2. **Overview of Mitigation Action Assessment Protocol: key considerations, structure**
3. **Road-testing in Peru: customization and ex-ante program-level assessment of mitigation actions**
4. **Conclusions**

Objectives of the Mitigation Action Assessment Protocol

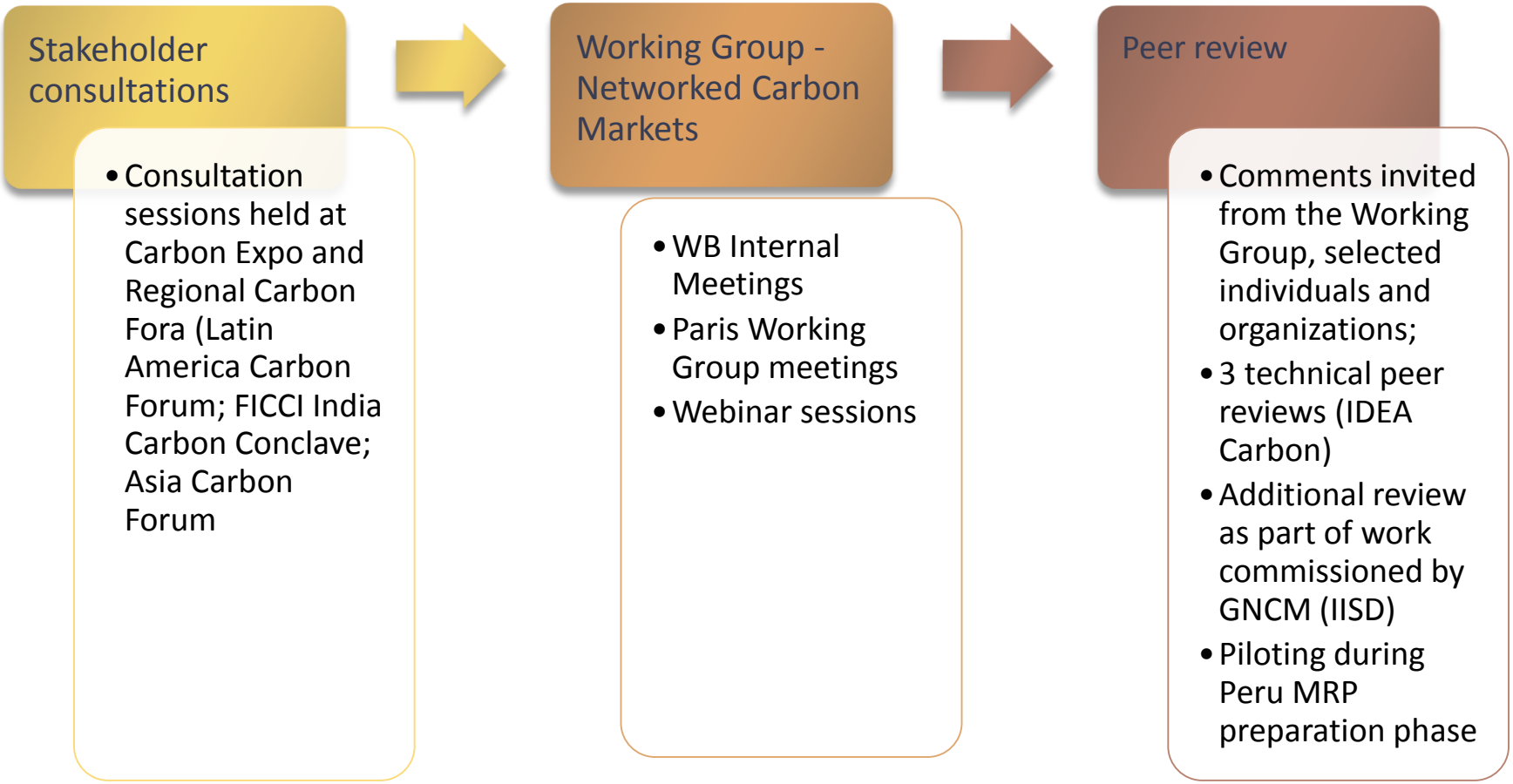
1. Provide confidence to investors on the viability and level of risk of different carbon assets ensuring environmental integrity.

2. Develop a mechanism to compare different assets and their mitigation value

3. Establish a framework to evaluate exchangeability of different carbon assets.

4. Facilitate benchmark and improvement

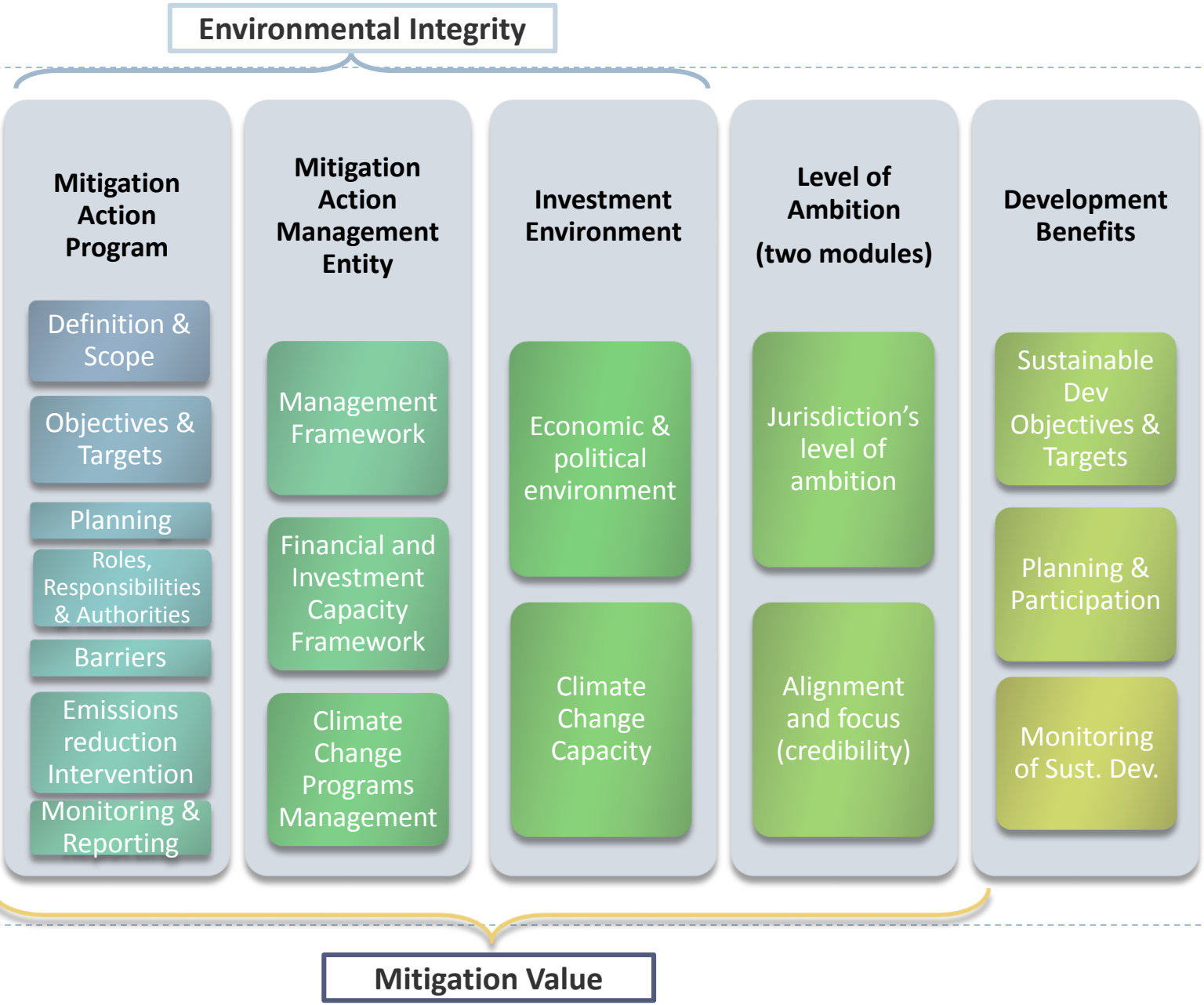
Consultation Process



Goals and rating structure - key considerations

- Applicable to a range of environmental assets. Initial focus on carbon assets and mitigation programs/NAMAs.
- Rating framework based on different risk categories.
- User (investor, jurisdiction, etc.) decides weight of each risk category.
- Ex ante/ex post rating: at the design and after implementation.
- Rating leads to a range of outputs reflecting a level of risk for a group of assessment attributes.
  - So far: ER validation/verification is a yes/no process.

Mitigation Actions Assessment Protocol- rating modules & areas

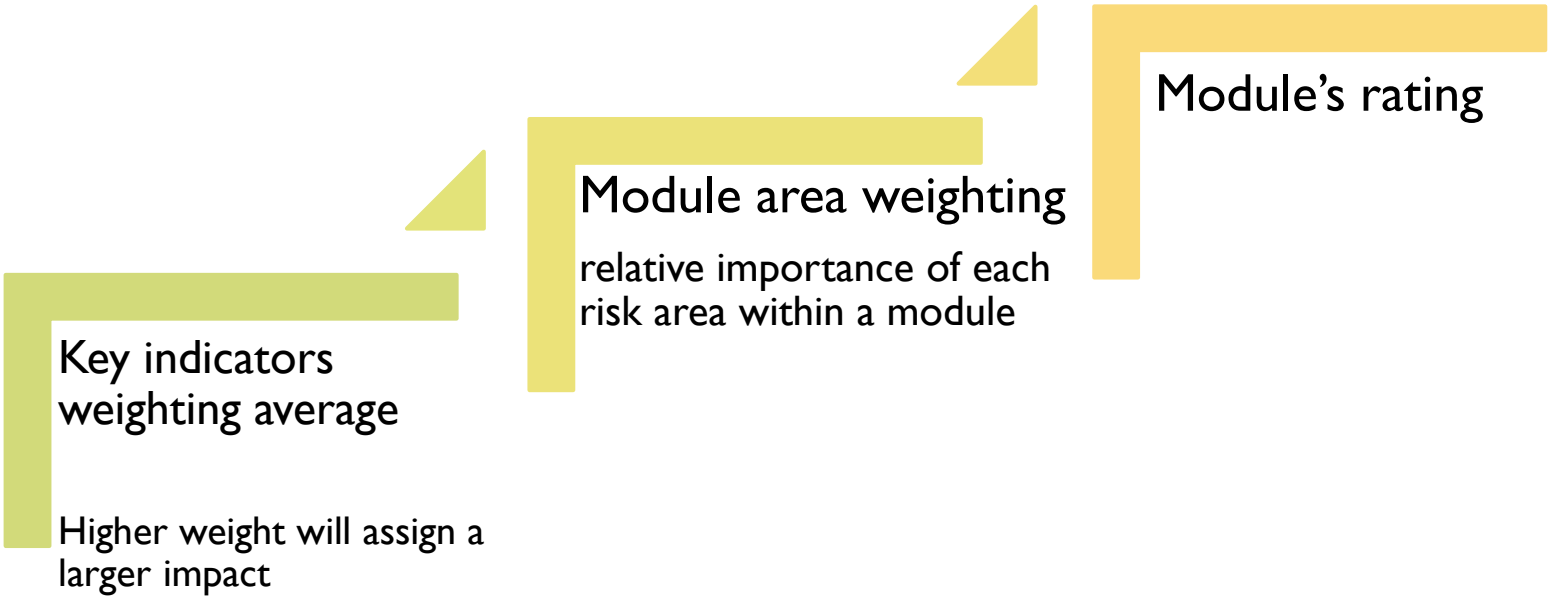


Module	Rating Area	Weight	Indicators
1. Mitigation Action Program	Definition & Scope	14%	5
	Objectives & Targets	20%	4
	Planning	22%	7
	Roles, Responsibilities & Authorities	7%	5
	Barriers	7%	1
	Emissions Reductions from Interventions	20%	7
	Monitoring & Reporting	10%	3
2. Mitigation Action Management Entity	Management Framework	30%	2
	Financial & Investment Capacity Framework	33%	3
	Climate Change Program Management	37%	3
3. Investment Environment	Internationally Recognized Country Ratings	45%	4
	Climate change infrastructure at the program level	55%	4
4. Development Benefits	Sustainable Dev. Objectives & Targets	35%	7
	Planning and Participation	45%	8
	Monitoring of Sustainable Dev	20%	6

Mitigation Action Assessment Protocol - Example

Module	Module Area	Area Weighting	Key Indicator	KI Weighting		Score Range	KI Score Range	Over-ride Score	Level of Confidence	Over-ride Justification	KI Score
Program Design	Definition and scope of the NAMA	20%	Scope of the NAMA and its contributions to Sustainable Development.	20%	The scope of the NAMA is clearly defined and documented.	60-100	40-60		high		10.00
					The scope of the NAMA is defined but it is not consistent along the documentation of the program.	40-60					
					The scope of the NAMA is neither clearly defined nor documented.	0-40					
			Alignment with National priorities.	20%	The scope of the NAMA is aligned itself with the country climate change mitigation priorities as defined by the Government	60-100	0-40	30	low	even when the NAMA addresses cc mitigation and other benefits, it is taking place in a sector that is not a focus sector for the country as outlined in the National Climate Change Program	6.00
					The NAMA contributes to climate change mitigation but does not outline how it aligns itself with the National priorities on climate change mitigation as defined by the Government	40-60					
					The NAMA does not demonstrate how the scope is aligned with the country climate change mitigation priorities as defined by the Government	0-40					
			NAMA approval by relevant authorities	10%	The NAMAs have been developed and implemented with the approval of the relevant national authorities. (Approver in the UNFCCC NAMA Registry)	60-100	60-100		high		8.00
					The approval of the relevant national authorities has been requested but is still pending	40-60					
					There is no evidence of the approval of the relevant national authorities.	0-40					
			Starting date, milestones and length duration of the Program	20%	The starting date of the NAMA is clearly defined and justified in terms of when the emissions reduction can be attributed to the NAMA. Milestones are included to allow progress and effectiveness to be reviewed.	60-100	0-40		high		4.00
					The starting date is defined but it is not possible to conclude that the starting date is linked to the accounting of ER due to the NAMA implementation.	40-60					
					The starting date is not clearly defined, is unjustified or is inconsistent across the NAMA documentation.	0-40					
			Boundaries for the Program in terms of a geographical area of implementation	30%	The geographical boundary of the Program is defined in accordance to the jurisdiction authority of the NAMA Implementation Entity (NIE). The boundaries analysis includes the evaluation of possible double counting risk with other ongoing programs and jurisdictions	60-100	40-60	40.00	high	the geographical boundaries are defined. For the proposed interventions, the NAMA identifies other possible jurisdiction that can be impacted. Nevertheless, the NAMA does not adress how those cross effects in ER can be quantified.	12.00
					The geographical boundary of the Program is defined but there is no justification of how it can interact with the jurisdiction authority of the NAMA Implementation Entity (NIE) and do not take into account possible double counting risk with other ongoing programs and jurisdictions.	40-60					
					The geographical boundary of the Program is not clearly defined.	0-40					

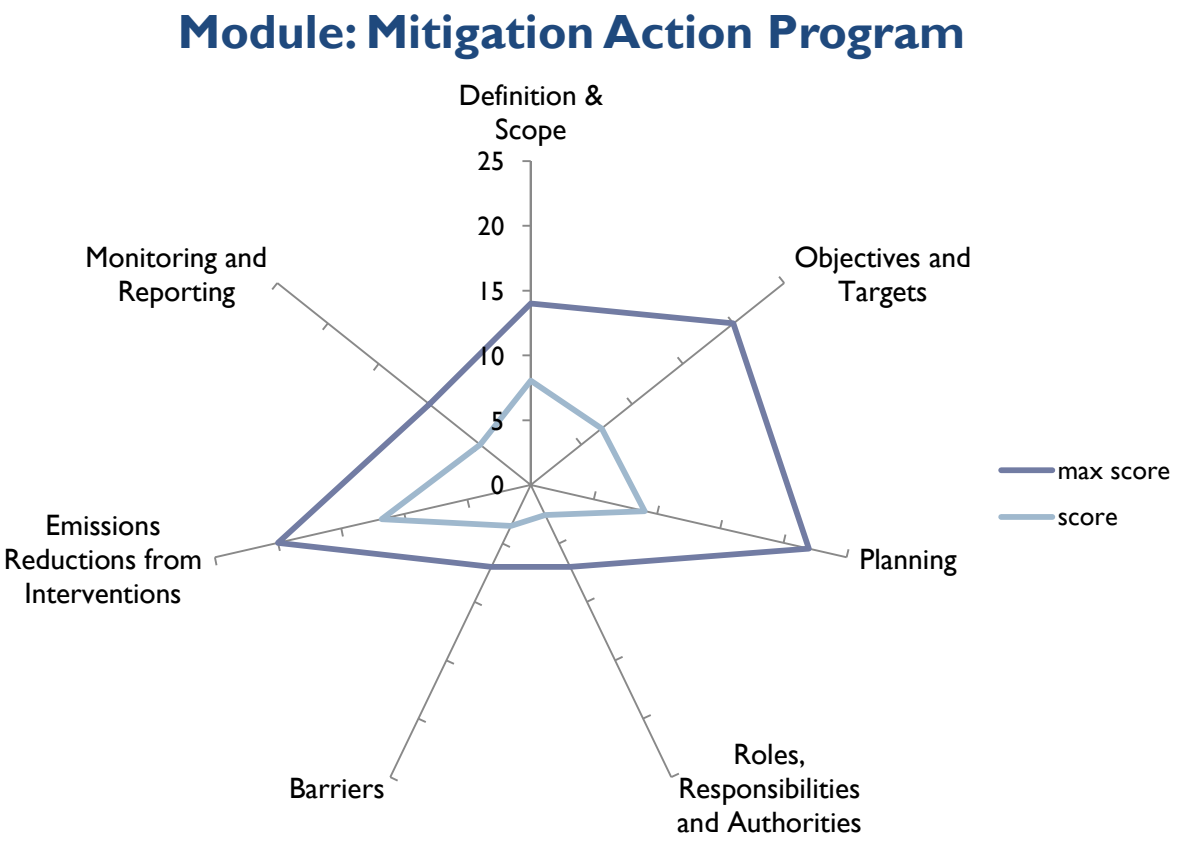
Rating Structure



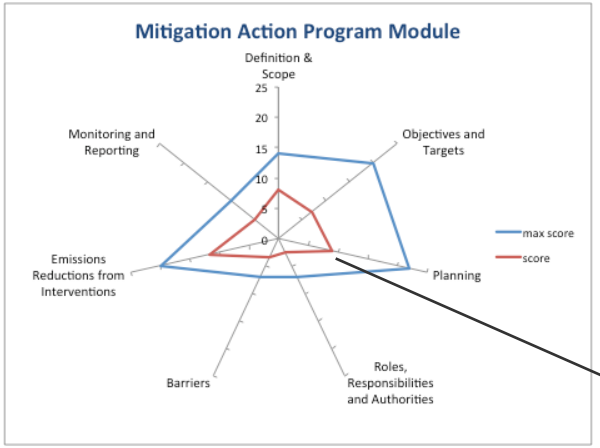
Key Indicators scoring:

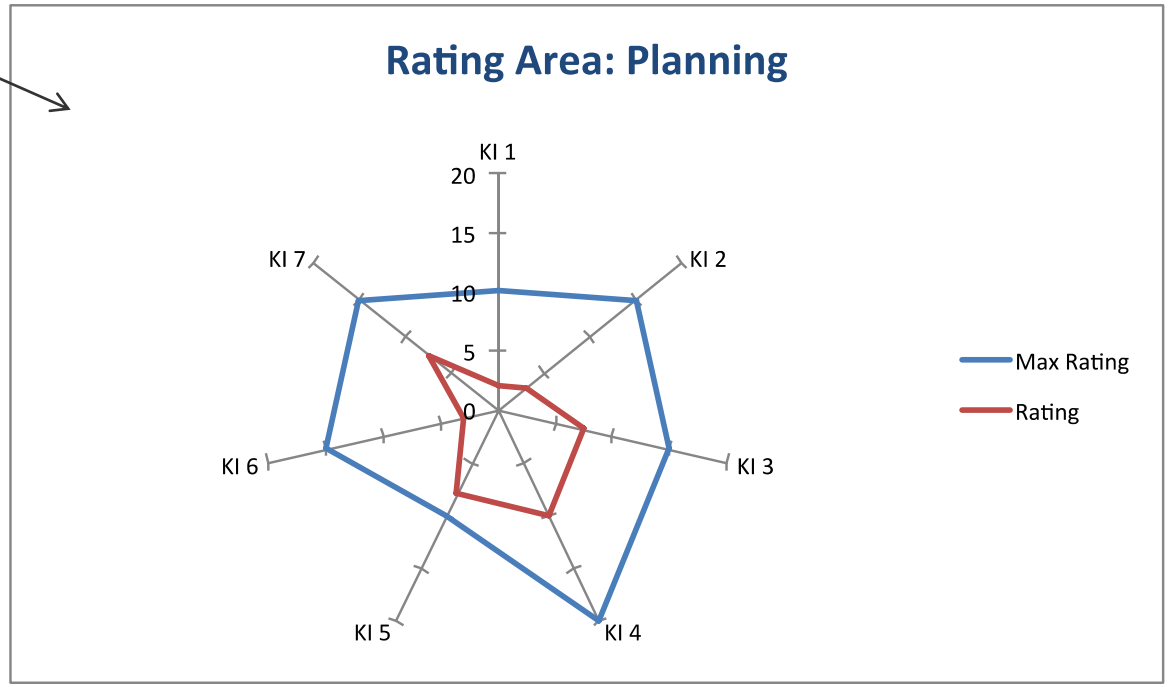
- Score range for each level of development
  - Default
  - Override score
- Level of confidence

Mitigation Actions Assessment Protocol - Example

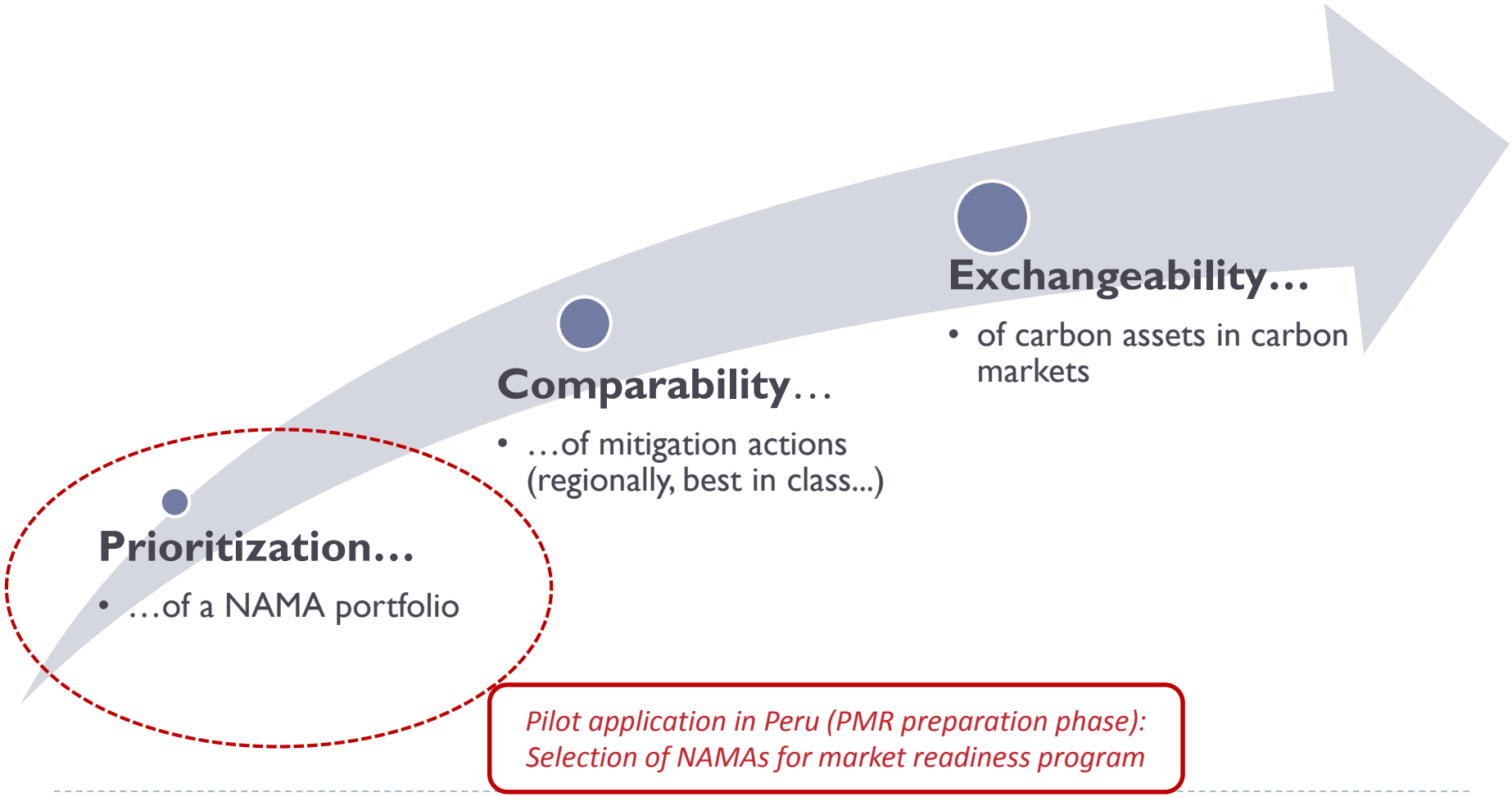


Mitigation Actions Assessment Protocol- Example





Evolution of the system



Pilot application of program-level assessment in Peru

Peru MRP elaboration: selection of 3 NAMAs for development of crediting instrument

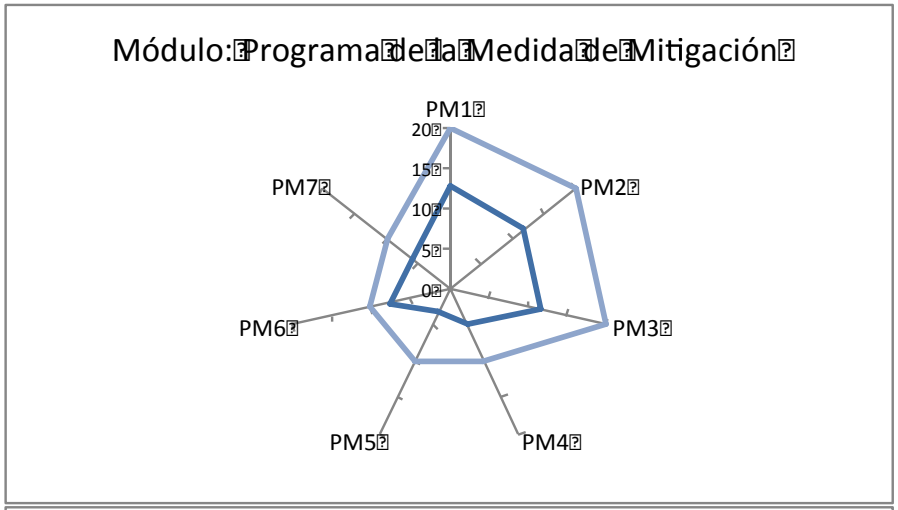
- Shortlisting of mitigation actions for ex ante assessment
  - Core criteria set by MoF and MinEnv
  - Review of 80+ mitigation actions: Peru LEDS, NAMA pipeline, etc.
- Customization of Mitigation Action Assessment Framework
  - Protocol developers (> evaluators) and national expert group
  - For each module: definition & weightings of areas / indicators / verifiers;
  - New module on compatibility with 'results-based budgeting system'.
- Ex-ante assessment of 10 prioritized mitigation actions
  - Consultations/interviews with NAMA developers/sponsors;
  - Supplemented by desk review of program documentation

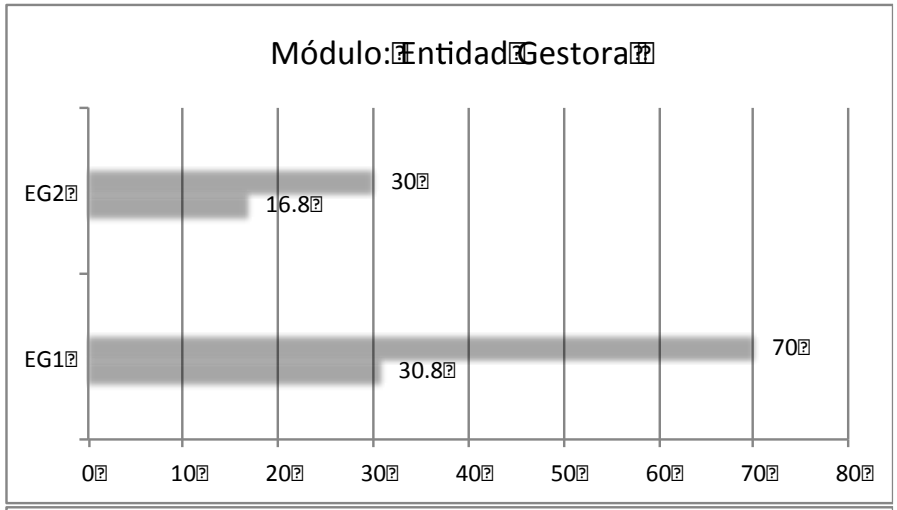
Peru Mitigation Action Assessment Protocol – overview & weightings for program-level assessment

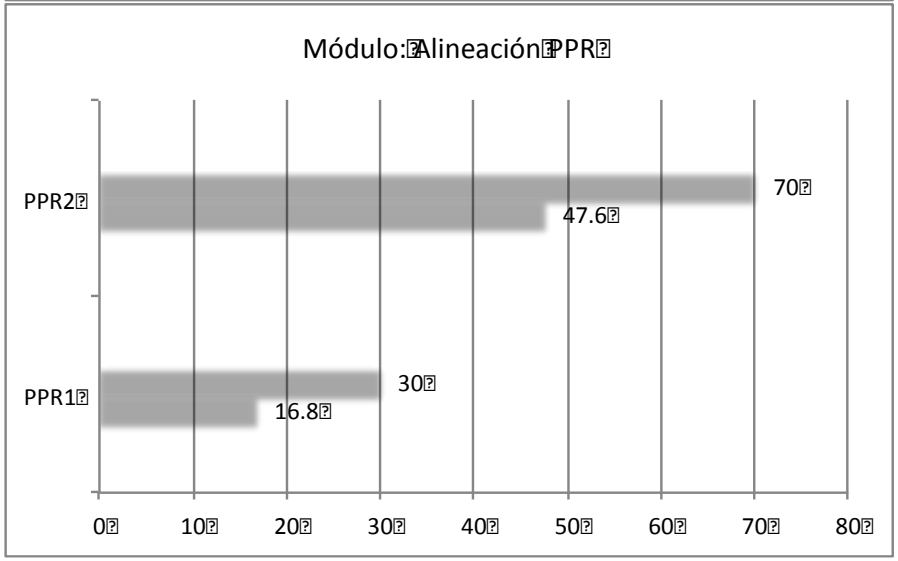
Módulo	Área de Evaluación		Importancia Relativa
Programa de Medida de Mitigación	PM1	PM1. Definición y alcance de la medida de mitigación	20%
	PM2	PM2. Objetivos y metas	20%
	PM3	PM3. Planificación	20%
	PM4	PM4. Recursos disponibles, roles, responsabilidades y autoridades	10%
	PM5	PM5. Documentos, control de documentos y registros	10%
	PM6	PM6 reducción de emisiones de intervenciones	10%
	PM7	PM7 monitoreo y reporte	10%
Entidad Gestora	EG1	EG1 Marco de Gestión	70%
	EG2	EG2 Gestión de programas del Cambio Climático.	30%
Alineación con Prioridades Presupuestarias	PPR1	PPR 1 Medida de Mitigación en el contexto PPR	30%
	PPR2	PPR2 Sector y gestion del PPR	70%
Contribución al Desarrollo Sostenible	BD1	BD1 Alcance, Objetivos y Metas para la Contribución al Desarrollo Sostenible	40%
	BD2	BD 2 Planificación y Paticipación hacia un Desarrollo Sostenible	30%
	BD3	BD 3 Seguimiento de la Contribución al Desarrollo Sostenible	30%

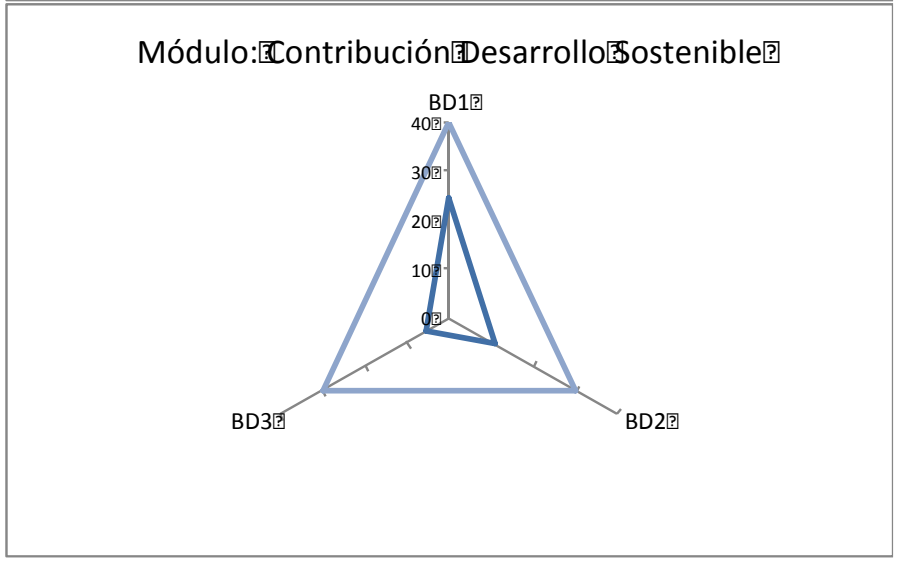
< Subset of key indicators for each area

Peru Waste Management NAMA – overview: ex-ante assessment









Some conclusions…

- This work aimed at exploring the use of ratings of carbon assets and specifically, the development of a rating framework for Mitigation Actions.
- The final goal is to provide confidence to investors and clarity to users. Promote comparability and ultimately exchangeability of carbon assets.
- The system aims at rewarding ambitious targets at the national level, and alignment between individual actions and national commitments/'INDCs'.
- Protocol applicable to different carbon assets. Mitigation Actions and NAMAs were selected as a first case.
- At the current status of the market, it will help to define the components of a sound mitigation action/NAMA, identify areas of improvement (> priorities for market readiness activities), and compare NAMAs among themselves.
- Participatory process involving multiple stakeholders and consultations has been essential for the evolution of this assessment framework.

TRANSACTION SCENARIOS AND TRADING RULES FOR NETWORKED CARBON MARKETS

Presentations by:

- ***Jennifer Austin***, Harvard Kennedy School
- ***Justin Macinante,*** Legal Division, FirstClimate (via Webex)

Networked Carbon Markets Initiative

– Concept Development –

Using Mitigation Value to Guide Design of Trading Rules

By: Jennifer Austin,
Harvard Kennedy School 2015
STC, World Bank

Nov 12, 2015

Using MV to Design Trading Rules

Suggestion

- Creates political public pressure to increase ambition
- Like voluntary market may drive some demand

Shared Guidance

- MV could be anchor value which could be further adjusted based on other discretionary factors
- CV could be required to be within certain range of assessed MV.

Binding Rules

- Abiding by rules based on assessed MV is requirement for participation in Global market, or club network ($MV=CV_{all}$)

Trade Rules Scenarios: 3 Representative Countries

- Each with domestic Cap and Trade program
- Mitigation values assessed:
  - Country A MV = 1
  - Country B MV = 0.8
  - Country C MV = 0.6

Trading Rule Options:

- Universal Exchange Rates
- Variety of Discount Rate Scenarios

Universal Exchange Rates: In country A (highest rated)

$MV_A = 1.0$

$MV_B = 0.8$

$MV_C = 0.6$

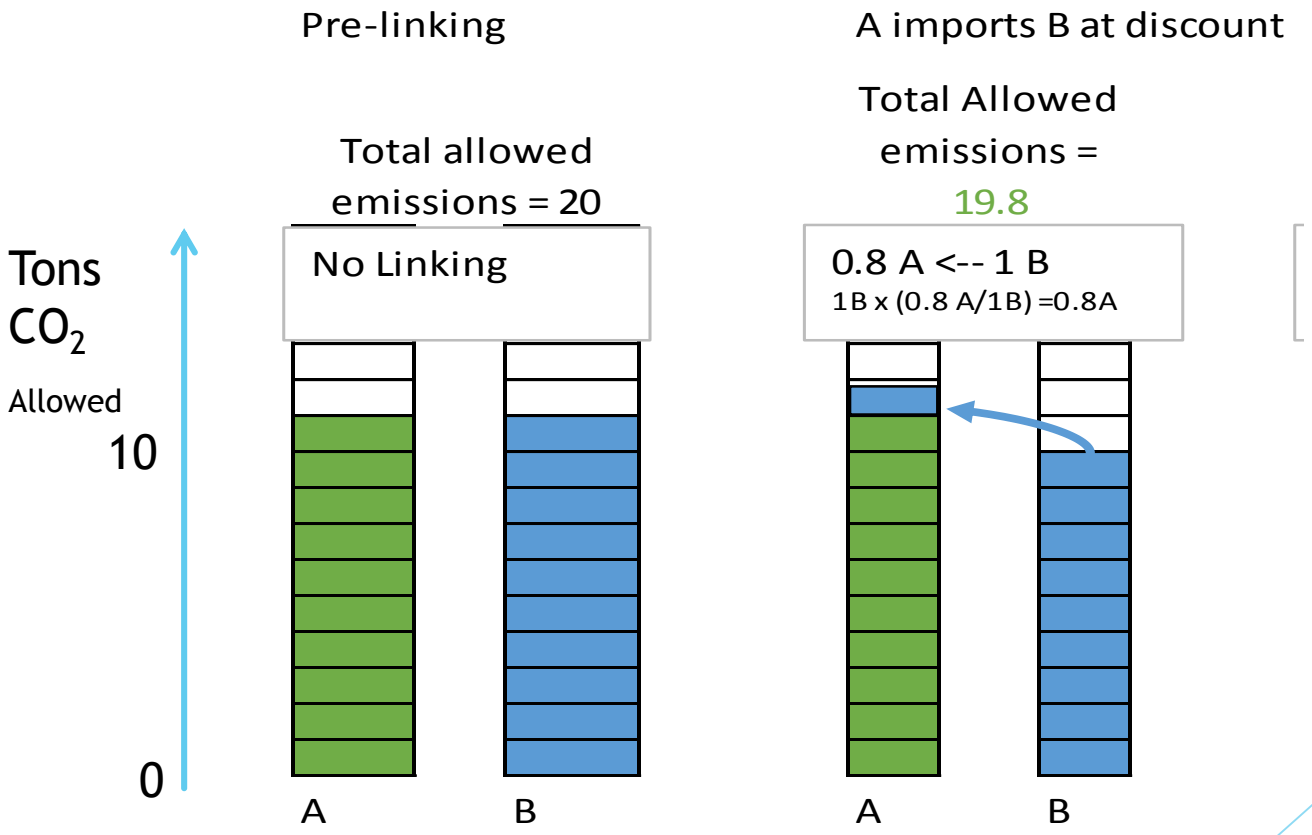
Polluter emitting 1 ton CO_2 in Country A owes:

1.0 A allowance *or*
1.25 B Allowances *or*
1.67 C Allowances

$MV_A / MV_B = 1.0/0.8 = 1.25$
$MV_A / MV_C = 1.0/0.6 = 1.67$

→ Cost savings
→ Reduced overall emissions if lower rated allowances are imported to Country A at a reduced CV.

Direction of Trade and Total Emissions



Universal Exchange Rates
In country B (mid-rated)

$MV_A = 1.0$

$MV_B = 0.8$

$MV_C = 0.6$

Polluter emitting 1 ton CO_2 in Country B owes:

1.0 B allowance (*assumed*) *or*

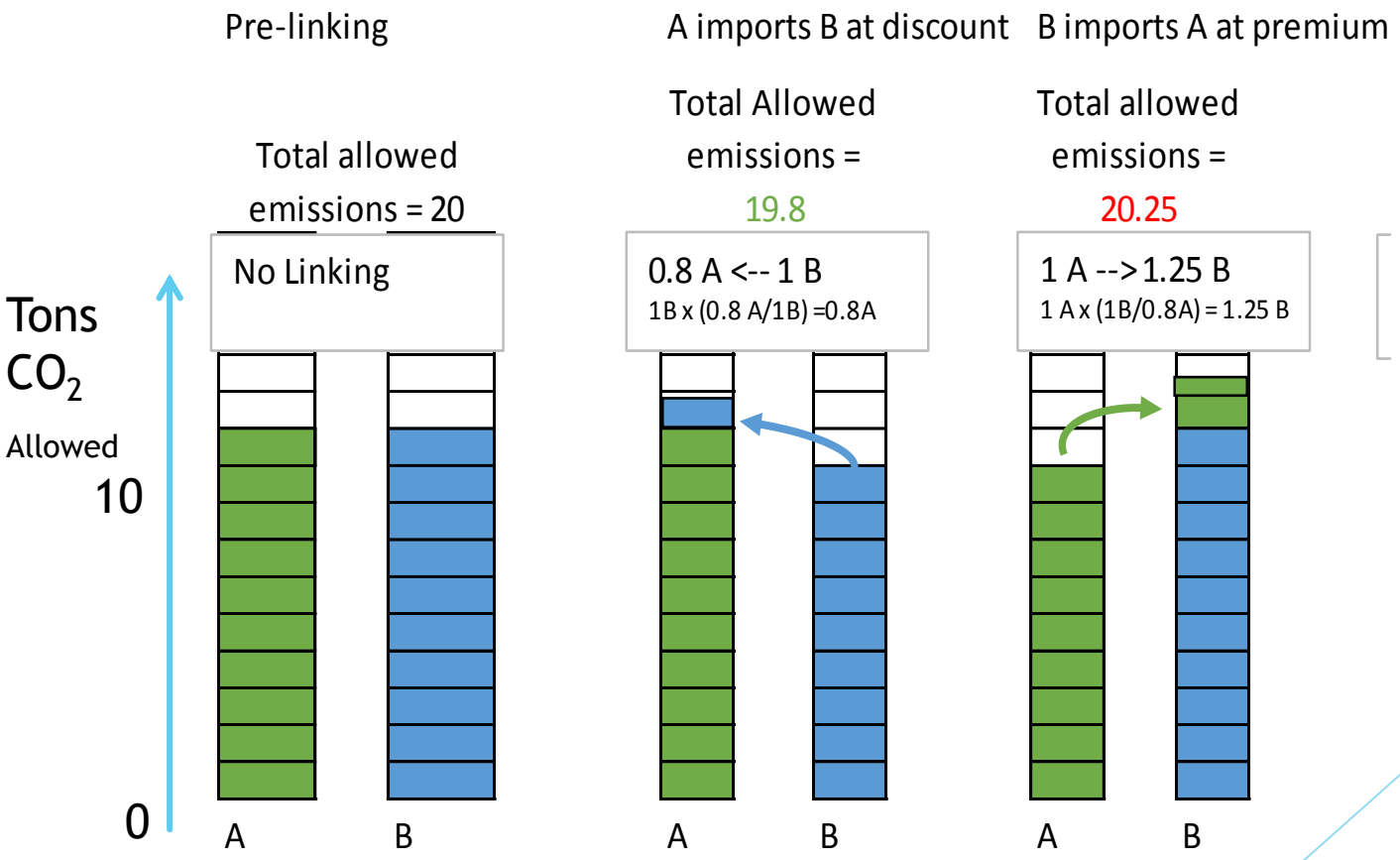
???

0.8 A Allowances??
1.33 C Allowances??

$MV_B / MV_A = 0.8/1.0 = 0.8$
$MV_B / MV_C = 0.8/0.6 = 1.33$

→ Increased overall emissions if A allowances are imported into Country B at an increased CV.
→ Decrease in overall emissions if C allowances are imported into Country B at a decreased CV.

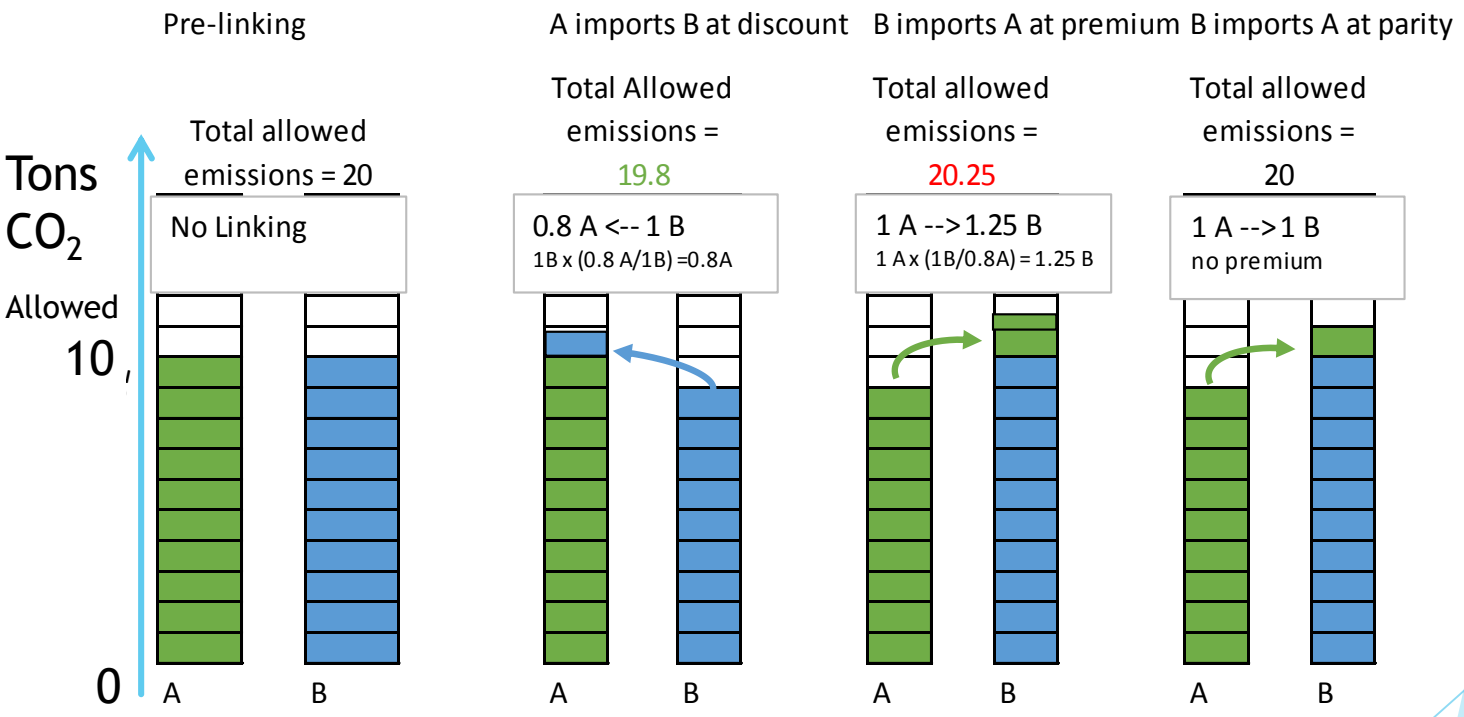
Direction of Trade and Total Emissions



Guarding Against Increased Total Emissions

- Ask Country B to say CV = MV
- **All countries agree CV is always ≤ 1**
  - **Or CV of imported allowance is always ≤ CV or that allowance at point of origin (Discounting only)**
  - (Caveat: even harder if problem is enforcement, rather than ambition differences)

Total Emissions Recap



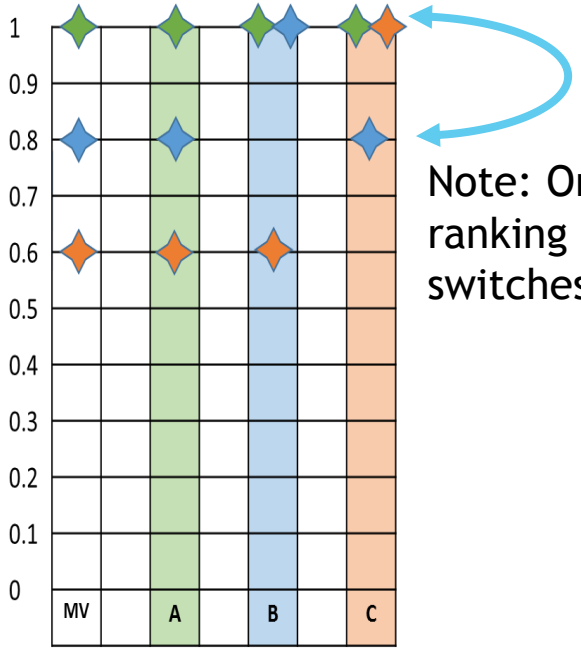
MV Based Discount Options:

Assume Domestic CV =1, and say foreign CV ≤ 1

1. Full MV discounting – all foreign allowances discounted by assessed MV
2. Relative MV discounting – all foreign allowances discounted according to assessed MV relative to domestic MV
3. MV Minimum required discount – all foreign allowances discounted by at least MV
4. Discount rates fall within certain ranges of MV

Discount Options Compared

Full MV Discount



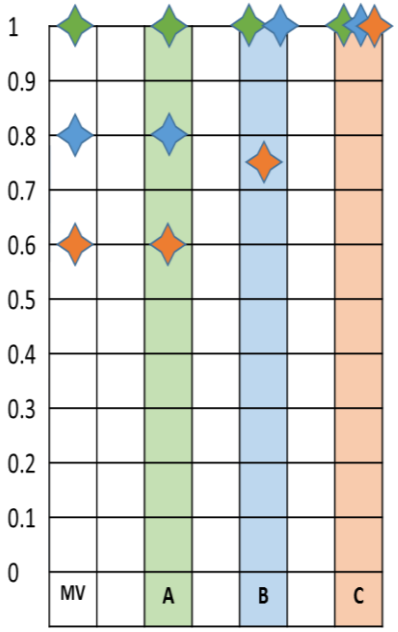
Note: Order of ranking of C and B switches

$MV_A = 1$

$MV_B = 0.8$

$MV_C = 0.6$

Relative MV Discount



Discount Options Takeaways and Open Questions

- If CV of allowance in foreign jurisdiction is always less than or equal to CV of that allowance at origin, then carbon emissions will not increase from trade (caveat: enforcement problems)

Questions:

- Will domestic CV =1 always?
- Price and liquidity impacts of different discounting frameworks?
- Opportunities for arbitrage?

Conclusions

- Assigning MV does not itself guarantee environmental integrity of trade, but can provide a common metric around which to design trade rules
- Actual impacts on total emissions depends on trade rules and direction of trade, which depends on prices
- Additional analysis needed to understand trade flows and pricing impacts of various design options
- Insights into emissions impact of different trade rules scenarios could inform efforts to define MV itself

Networked Carbon Markets

Mini-seminar 12 November 2015

'TRANSACTION SCENARIOS'

JUSTIN MACINANTE

Transaction Scenarios

Form of transactions can affect the way key elements – MV, CV, FV interact

Illustrate by running through three scenarios

i. Foreign unit converted model
ii. Foreign unit imported model
iii. ITU “transaction currency” model

Next Steps: propose a simulation exercise in 2016

Transaction Scenarios

In these scenarios, units from the scheme in Jurisdiction A (A units) are being sold by Seller A to Buyer B, who has compliance obligations in Jurisdiction B, which trades B units

All transactions will need to be settled and cleared, so it is reasonable to assume that there will be such an intermediary in all transactions providing settlement and clearing

Transaction Scenarios

(i) Foreign Unit converted Model

Jurisdiction A	Jurisdiction B
MV = A	MV = B
Trades A units	Trades B units
Compliance entity A wishes to sell 12000 A units to Compliance entity B	Compliance entity B wishes to buy 12000 A units from Compliance entity A
On xx/yy/zz date:	On xx/yy/zz date:
e.g., MV A/B translates into an exchange rate of 1.5 (that is, 1.5 A units = 1 B unit)	e.g., MV A/B translates into an exchange rate of 1.5 (that is, 1.5 A units = 1 B unit)
12,000 A units debited Compliance entity A's account in A registry	8,000 B units credited Compliance entity B's account in B registry

The applicable exchange rate, on the date of the transaction, determines the number of carbon units that are credited to the buyer's account in the buyer's registry in the carbon units of the buyer's jurisdiction: the regulator/scheme administrator in Jurisdiction B cancels the 12000 A units received in the registry account and issues in their place 8000 B units

The transacted number of seller's carbon units are debited from the seller's account in the seller's registry: regulator/scheme administrator in Jurisdiction A doesn't need to do anything after the 12000 A units have been transferred out of the A registry account

Transaction Scenarios

(ii) Foreign Unit imported Model

Jurisdiction A	Jurisdiction B
MV = A	MV = B
Trades A units	Trades B units
Compliance entity A wishes to sell 12000 A units to Compliance entity B	Compliance entity B wishes to buy 12000 A units from Compliance entity A
On xx/yy/zz date:	On xx/yy/zz date:
e.g., MV A/B translates into an exchange rate of 1.5 (that is, 1.5 A units = 1 B unit)	e.g., MV A/B translates into an exchange rate of 1.5 (that is, 1.5 A units = 1 B unit)
12,000 A units debited Compliance entity A's account in A registry	12,000 A units credited Compliance entity B's account in B registry
The respective MVs of the two jurisdictions translate into an exchange rate between them (how this is worked out will be critical, but assume for purpose of this example it can be). The counterparties agree how many of the seller's carbon units they wish to transact The applicable exchange rate, on the date of the transaction, is immaterial to the transaction as the number of carbon units that are credited to the buyer's account in the buyer's registry are the same as the number debited from the seller's account in the seller's registry: the regulator/scheme administrator in Jurisdiction B by agreement with Jurisdiction A, accepts A units and credits the 12000 A units received in the registry account to Compliance entity (buyer) B The transacted number of seller's carbon units are debited from the seller's account in the seller's registry: regulator/scheme administrator in Jurisdiction A doesn't need to do anything after the 12000 A units have been transferred out of the A registry account	

Transaction Scenarios

(iii) ITU "transaction currency" Model

Jurisdiction A		Jurisdiction B
MV = A	**Index ('II')** based on e.g., all MVs of trading jurisdictions; Index has notional International Transaction Units (ITU)	MV = B
Trades A units		Trades B units
Compliance entity A wishes to sell 12000 A units to Compliance entity B		Compliance entity B wishes to buy 12000 A units from Compliance entity A
On xx/yy/zz date:	On xx/yy/zz date:	On xx/yy/zz date:
e.g., MV A/II translates into an exchange rate of 0.67 (that is, 1.5 A units = 1 ITU)	e.g., MV A/II translates into an exchange rate of 0.67 (that is, 1.5 A units = 1 ITU)	e.g., MV A/II translates into an exchange rate of 0.67 (that is, 1.5 A units = 1 ITU)
12,000 A units debited Seller A's account in registry A	8,000 ITUs held in Seller A's pending account on International Settlement Platform	
	8,000 ITUs transferred from Seller A's account to Buyer B's pending account	
e.g., MV II/B translates into an exchange rate 0.8 (that is, 0.8 ITUs = 1 B unit)	e.g., MV II/B translates into an exchange rate 0.8 (that is, 0.8 ITUs = 1 B unit)	e.g., MV II/B translates into an exchange rate 0.8 (that is, 0.8 ITUs = 1 B unit)
		10,000 B units credited Buyer B's account in registry B

The applicable exchange rate A/II, on the date of the transaction, determines the number of ITUs that are credited to the Seller A's pending account on the International Settlement Platform;
On financial settlement, the ITUs in Seller A's pending account are transferred to Buyer B's pending account;
The applicable exchange rate II/B, on the date of transaction (or on whichever date Buyer B decides to move them from its International Settlement Platform pending account to its account in registry B), determines the number of B units that are credited to the Buyer B's account in registry B.

Transaction Scenarios

Summary

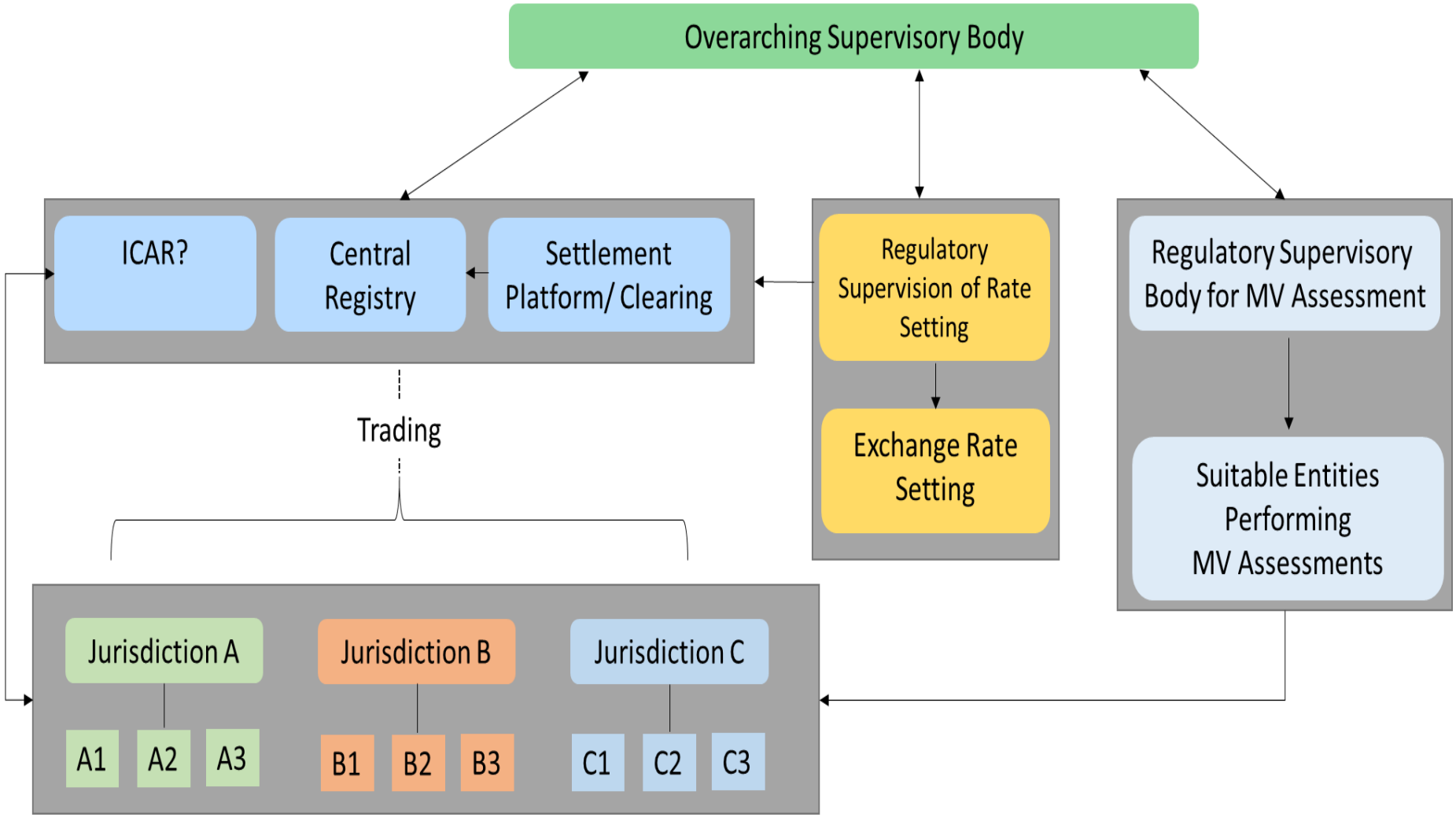
Scenario	*Price*	*No. of units on trade occurring*	*CV in Buyer's scheme*	*Administration*
(i) Foreign unit converted	Depends on market, but exchange rate relevant	Depends on exchange rate	CV=1 as only domestic units credited	Decentralized and more complex
(ii) Foreign unit imported	Depends on market, exchange rate less relevant due to non-conversion and CV uncertainty	No conversion on contract date, so same number of foreign units as per contract	CV depends on buyer's scheme administrator. Risk for Buyer	Decentralized and more complex
(iii) International Transaction Unit transaction currency	Depends on market, but exchange rate relevant	Depends on exchange rate	CV=1 as only domestic units credited	Centralized

Next Steps

Simulation proposal for 2016

Purpose:

- (a) drawing together the various strands of NCM work; and
- (b) providing a tangible focus for meetings with partner organizations in the finance sector


Overarching Supervisory Body
ICAR?
Central Registry
Settlement Platform/ Clearing
Regulatory Supervision of Rate Setting
Exchange Rate Setting
Regulatory Supervisory Body for MV Assessment
Suitable Entities Performing MV Assessments
Trading
Jurisdiction A
Jurisdiction B
Jurisdiction C
A1
A2
A3
B1
B2
B3
C1
C2
C3

Next Steps

From the diagram, it can be seen that there are ten different institutions or groups of entities that may be involved in NCM. They are:

- Jurisdictions
- Entities trading under the ETS of those jurisdictions
- ‘Suitable entities’ performing MV Assessments
- Regulatory Supervisory Body for MV Assessments
- Settlement Platform/clearing arrangements
- Central Registry
- Exchange Rate setting entity
- Regulatory Supervisory Body for exchange rate setting
- ICAR
- Overarching Supervisory Body

Next Steps

Simulation proposal for 2016

Objectives:

- Learning experience and knowledge building
- Design testing
- Inform policymakers
- Research specific ideas
- Engagement and outreach
- Practice round

INSTITUTIONS AND GOVERNANCE STRUCTURES TO SUPPORT NETWORKED CARBON MARKETS

Presentations by:

- ***Juerg Fuessler***, INFRAS consulting and ***Luca Taschini***, Grantham Research Institute of the London School of Economics (via Webex)
- ***Henry Derwent,*** Senior Advisor, Climate Strategies
- ***Pierre Guigon***, GCCCF, World Bank Group (discussion only)

Juerg Fuessler (INFRAS), Luca Taschini (LSE)

ICAR Prototypes

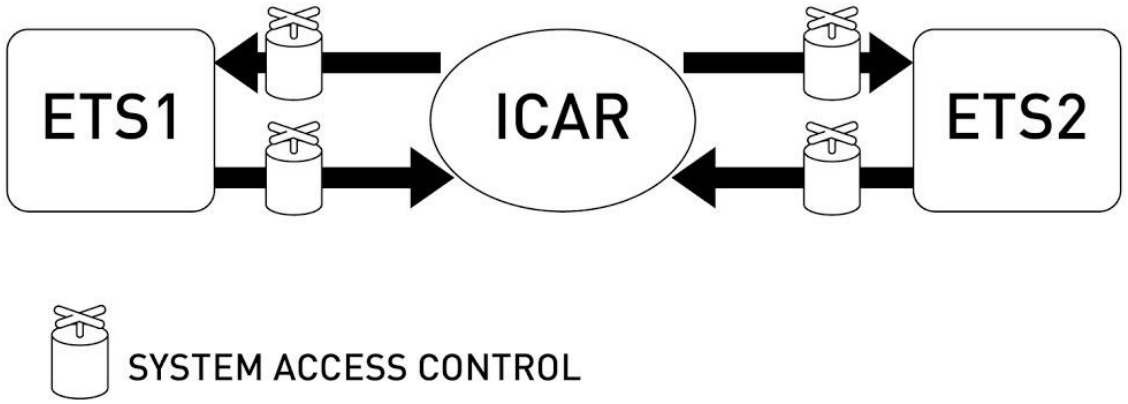
World Bank NCM Seminar 12.11.2015

Three ICAR prototypes for discussion

Element	**1 «Platform»**	**2 «Central bank»**	**3 «Gateway»**
Approach	«Hands off»	«Hands on»	«Facilitator»
ICAR Service	Platform for trading	Marketmaker and risk mitigator	Gateway for transfer of offsets Insurance services
Units	Local Units	International Units	International Units
Reserve	No	Yes	Yes
Formerly	*ICAR-M*	*ICAR-MP & ICAR-R*	*Insurance function*

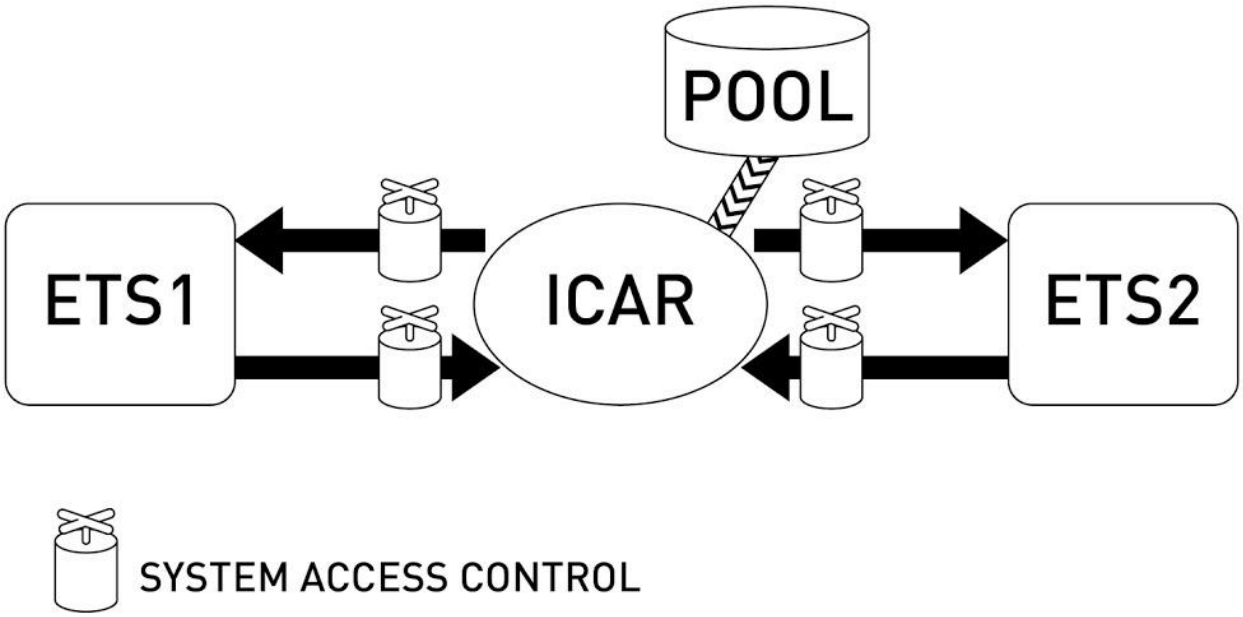
1 ICAR «Platform»

- Provide a platform for open trading among member jurisdictions and facilitate matchmaking.
- Buyers import non-domestic allowances and sellers export domestic allowances.
- Jurisdiction retaining partial system control.



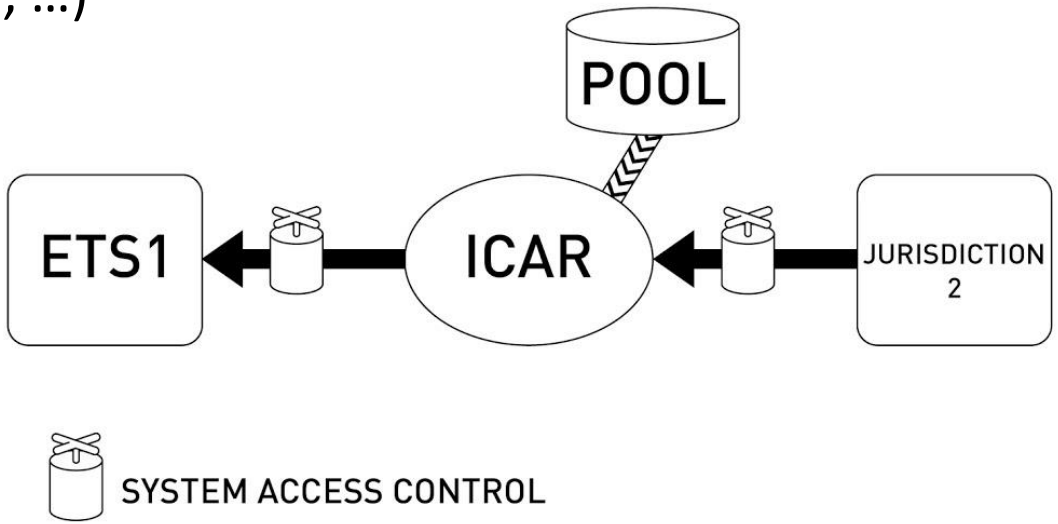
2 ICAR «Central bank»

- Provide a platform for centralized trading of International Units among member jurisdictions
- Transfer of allowances to/from ICAR is rules-based
- ICAR is a repository/pool of International Units



3 ICAR «Gateway and insurance»

- «Facilitator» for rules-based one-way transfer of International Units
- Helps buyer ETS to access guaranteed offset units
- Helps seller carbon instrument (ETS, offsetting, FIT, …) with guaranteed off-taking and insurance services
- Pool of units/fund for risk mitigation
- Insurance services for key mitigation action risks (issuance, reversal, …)



Thank you!

Contact

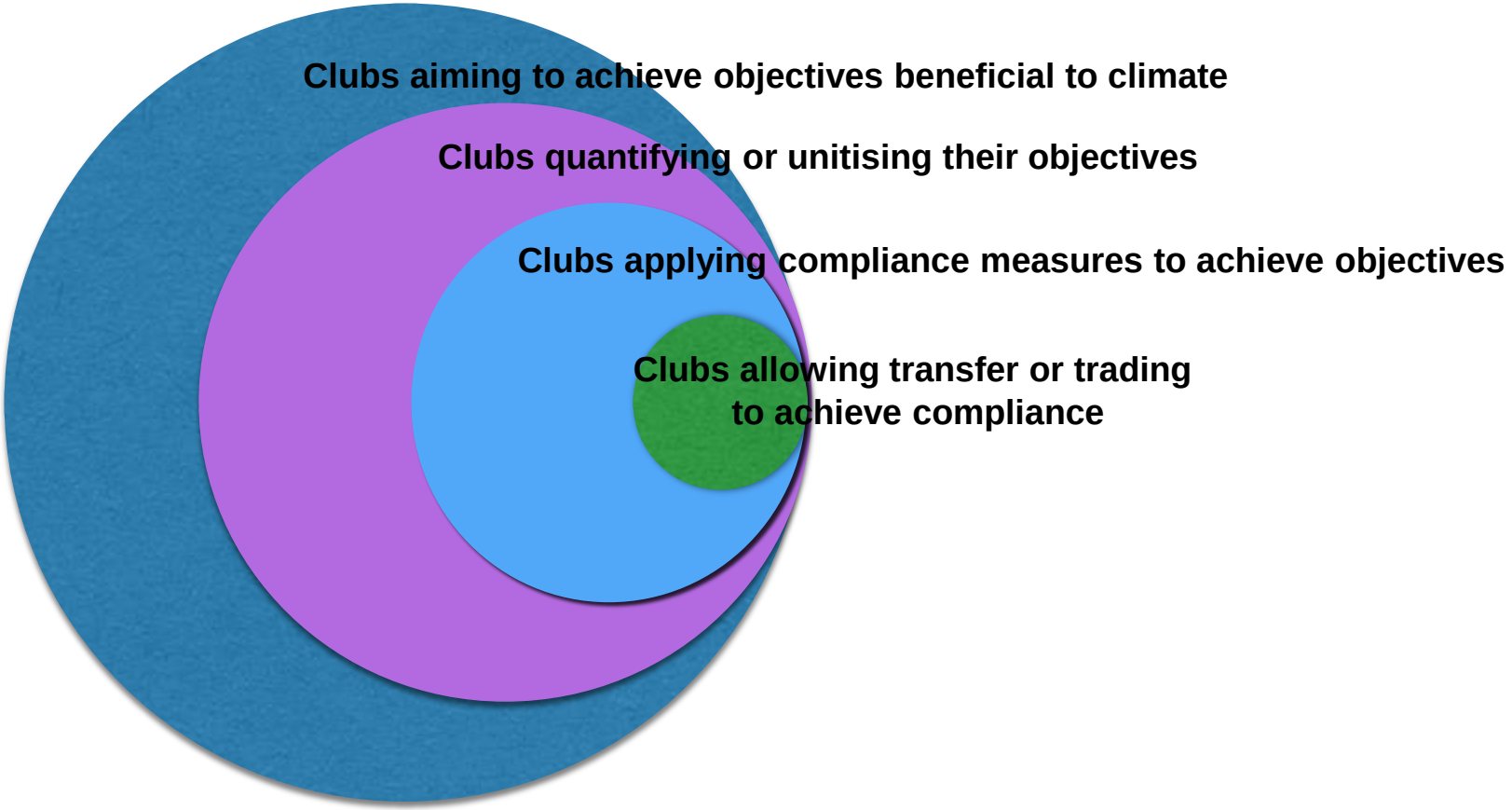
Juerg Fuessler
INFRAS AG
juerg.fuessler@infras.ch

Luca Taschini
London School of Economics
L.Taschini1@lse.ac.uk

Compatibility and Synergy between NCM and Climate Clubs

Main Purposes of Climate Clubs

- knowledge sharing and coordination
- technology transfer
- technology deployment, standards and incentives
- research, development and demonstration
- increasing trade in climate-relevant goods and services
- joint or aggregate carbon emissions reduction, absolute or relative
- similar reductions in other pollutants or energy use, with ancillary carbon consequences
- investment facilitation



Filtering the Climate Clubs to get closer to pricing

Impact of NCM Systems and Services on Clubs compared to single jurisdictions

- NCM offers ETS elements more technically difficult or expensive in transaction cost terms for a club than a single jurisdiction to create
- types of club only likely to proceed to using a trading system if clear to members that significant elements of a trading system could be taken more or less off-the-shelf
- NCM eases passage to agreement between club members, or otherwise aids club decision-making, by its independence and “third-party” status
- NCM’s approach to defining a common currency for links between jurisdictions opens up entirely new opportunities for clubs-with-trading