

Comparing Mitigation Effort in INDCs

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Next Steps for Intended Nationally Determined Contributions

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Approaches to Comparing Effort

- Role of Transparency
- Role of Comparability
- Implications for Negotiations

Role of Transparency

Uncertainty

- Uncertainty in credibility of commitments
 - Will countries implement policies to deliver on commitments?
 - Can a country's performance be observed?
- Exogenous Shocks
 - Economic growth shocks, energy system shocks may affect incentives for participation/compliance

Signaling

- Transparency and publicity of a commitment and outcomes enhances credibility (Schelling 1956)
- Publicity requires information structures created by rules of international institutions
- “Naming and shaming” and prospect of adverse reputational consequences may promote compliance

Incentives to Monitor

- Incentives for countries to defect from an agreement (free-ride) creates incentives for others to monitor
- Probability of detecting defection increases with transparency of regime
 - Reassure those predisposed to comply
 - Deter those considering defection

Building Credibility and Trust

- Repeated nature of climate negotiations allows for transparency to inform future talks
 - Countries unlikely to agree on subsequent round if they differ in understanding of previous round
- Sustaining cooperation requires effective monitoring
- Facilitates reciprocity that can accelerate ambition over time

Lessons from Policy Surveillance in Non-Climate Agreements

- Reviewed IMF, WTO, OECD, Montreal Protocol, CITES, and arms control agreements
- Key lessons
 - Credibility of information
 - Engaging peers
 - Learning
 - Implementing surveillance
 - Role of civil society

Role of Comparability

Why Compare Mitigation Effort?

- Normative / ethical approaches for burden-sharing
- Facilitative—supporting cooperation and future ambition
 - “Individuals tend to react to the positive actions of others with positive responses and the negative actions of others with negative responses.” Ostrom (1998)
 - How might parties judge positive or negative action?
 - Different parties and constituents judge differently?

Principles for Metrics of Comparability

- Comprehensive: captures the notion of “effort” in the widest possible sense. Similar countries ought to exhibit similar values in a “fair” agreement
- Measurable and replicable: directly observable or based on transparent analysis
- Universal: can be applied to efforts by a broad set of countries

Metrics I: Emissions (and other physical measures)

- Potential metrics
 - Relative to base year or forecast level
 - Relative to population or economic activity, absolute or change over time
- Pros/Cons
 - Associated with environmental outcome (+)
 - Measurable relative to history (+)
 - Choice of base year / index will give different countries an advantage (+/-)
 - Relative to forecast may be best notion of “effort” but less measurable (-)

Metrics II: Prices

- Potential metrics
 - Carbon dioxide or energy prices
 - Taxes / carbon price or net price of energy
 - Absolute levels or change over time
- Pros/Cons
 - Carbon price reflects policy effort (+)
 - Market prices are observable (+)
 - Reflect long-term investment incentives (+)
 - Exchange rates can be problematic (-)
 - Does not easily capture non-price policies (-)

Metrics III: Costs

- Potential metrics
 - Absolute or relative to GDP
 - Estimate for actual policies or least cost alternative
- Pros/Cons
 - Most closely reflects “effort” (+)
 - Not observed; requires modeling (-)
 - Actual policy costs could reward costly but ineffective policies (-)

Conclusions Regarding Metrics

- No single metric satisfies all three criteria
- Individual countries may prefer specific metrics that reflect their interests, resulting in lack of consensus among all parties to UNFCCC
- Recommend consideration of a suite of metrics
 - Analogous to use of a set of economic indicators for evaluating macroeconomic health

Illustration of Metrics, Ex Ante Review

		China 2030 emission peak	EU 1990 -40% by 2030	United States 2005 -26 to -28% by 2025
Emissions	versus historic base year	<requires modeling>	<requires modeling>	<directly observed>
	versus BAU future year	<requires modeling>	<requires modeling>	<requires forecast>
	Target year GHG/GDP	<requires modeling>	<requires modeling>	<requires forecast>
	$\Delta(\text{GHG}/\text{GDP})$ 2015-2025	<requires modeling>	<requires modeling>	<requires forecast>
	$\Delta(\text{GHG}/\text{GDP})$ 2015-2030	<requires modeling>	<requires modeling>	<requires forecast>
Price	CO ₂	<requires modeling>	<requires modeling>	<requires modeling>
	Fossil energy	<requires modeling>	<requires modeling>	<requires modeling>
	Electricity	<requires modeling>	<requires modeling>	<requires modeling>
Cost	cost versus BAU	<requires modeling>	<requires modeling>	<requires modeling>
	cost/GDP	<requires modeling>	<requires modeling>	<requires modeling>

Illustration of Metrics, Ex Post Review

		China 2030 emission peak	EU 1990 -40% by 2030	United States 2005 -26 to -28% by 2025
Emissions	versus historic base year		<directly observed>	
	versus BAU future year		<requires modeling>	
	Target year GHG/GDP		<directly observed>	
	$\Delta(\text{GHG/GDP})$ 2015-2025		<directly observed>	
	$\Delta(\text{GHG/GDP})$ 2015-2030		<directly observed>	
Price	CO ₂		<requires modeling>	
	Fossil energy		<directly observed>	
	Electricity		<directly observed>	
Cost	cost versus BAU		<requires modeling>	
	cost/GDP		<requires modeling>	

Planning for Ex Post Review

- Identify ex ante the data and analytic needs for ex post review
 - Implement data collection protocols
- Promote advanced transparency of ex post review process so that countries and stakeholders can assess interim progress
- Identify ways to implement policies that facilitate causal inference

Implications for Negotiations

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- Opportunities in voluntary information provision
 - Variation in INDCs could facilitate learning
 - Non-governmental experts can assess INDCs
- How do we transition to a rigorous, systematic approach to transparency?
 - Integration of ex ante/ex post analysis over time?
- Benchmarks for comparability?

Papers and Contact Information

Comparability of Effort in International Climate Policy Architecture, with W.A. Pizer, forthcoming, *Review of Environmental Economics and Policy*
<http://tinyurl.com/py2nuzr>

Comparing Emissions Mitigation Efforts across Countries, with W.A. Pizer and K. Akimoto, RFF Discussion paper, 2015, <http://tinyurl.com/pexqpk3>

The Crucial Role of Policy Surveillance in International Climate Policy. *Climatic Change* 126(3-4): 279-292, 2014, <http://tinyurl.com/p57avgx>

Policy Surveillance in the G-20 Fossil Fuel Subsidies Agreement: Lessons for Climate Policy, forthcoming, *Climatic Change*, <http://tinyurl.com/qd2olo3>

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