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CLIMATE TECHNOLOGY PARTNERSHIPS: FORM, FUNCTION AND IMPACT

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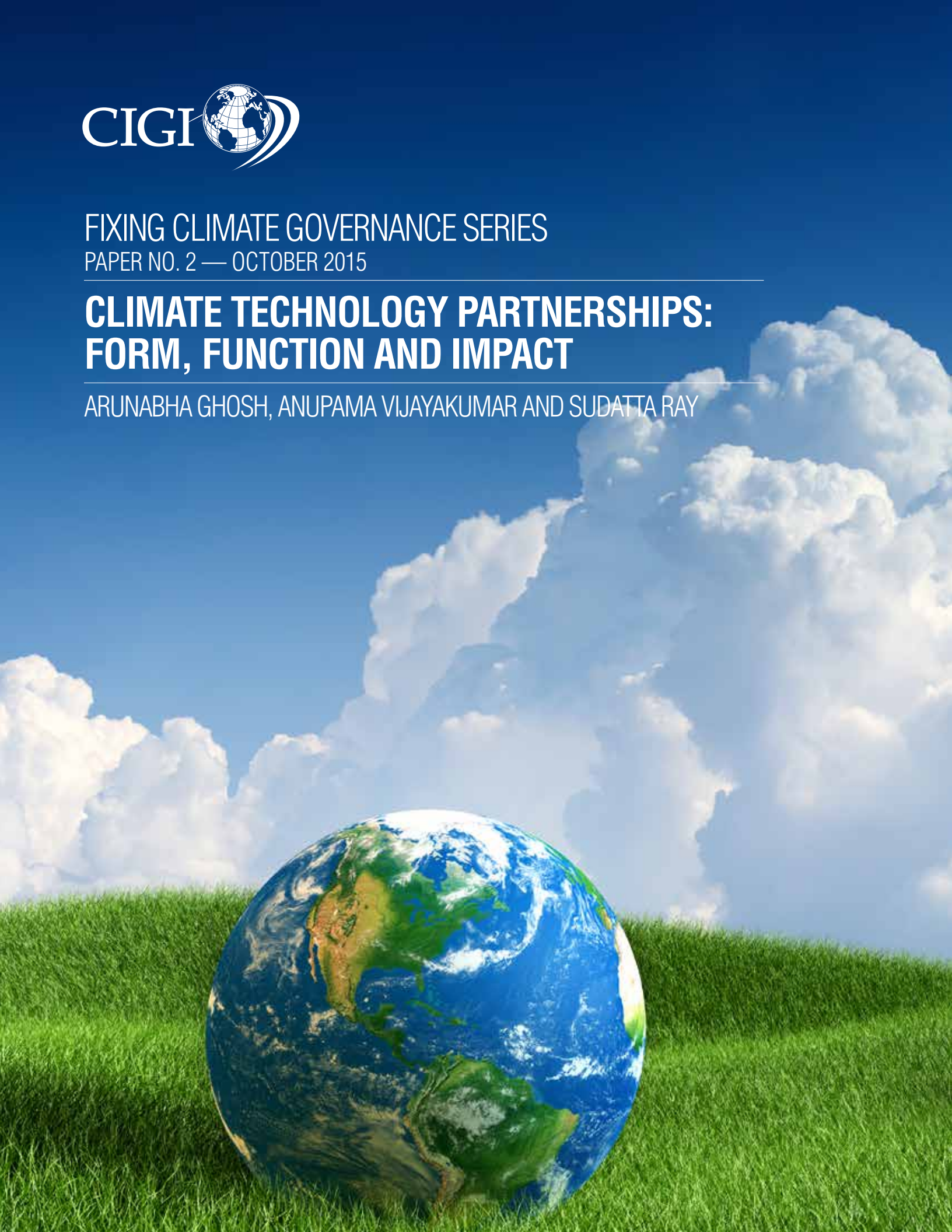

CLIMATE TECHNOLOGY PARTNERSHIPS: FORM, FUNCTION AND IMPACT

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ABOUT THE FIXING CLIMATE GOVERNANCE PROJECT

Project Leaders: **John Odell**, CIGI Senior Fellow and **David Runnalls**, CIGI Distinguished Fellow

Climate scientists agree that human activity has been changing our planet's climate over the long term. Without serious policy changes, scientists expect devastating consequences in many regions: inundation of coastal cities; greater risks to food production and, hence, malnutrition; unprecedented heat waves; greater risk of high-intensity cyclones; many climate refugees; and irreversible loss of biodiversity. Some international relations scholars expect increased risk of violent conflicts over scarce resources due to state breakdown.

Environmentalists have been campaigning for effective policy changes for more than two decades. The world's governments have been negotiating since 1995 as parties to the United Nations Framework Convention on Climate Change (UNFCCC). These talks have not yet produced agreements that are sufficiently effective in curbing greenhouse gas emissions or helping the world adapt to climate impacts. Some effort has shifted to partial measures by national governments, provinces, cities and private companies, which together, also fall far short of the need identified by science so far.

The Fixing Climate Governance project is designed to generate some fresh ideas. First, a public forum was held in November 2013. High-level workshops then developed a set of policy briefs and short papers written by experts. Several of these publications offer original concrete recommendations for making the UNFCCC more effective. Others make new proposals on such topics as how to reach agreements among smaller sets of countries, how to address the problems of delayed benefits from mitigation and concentrated political opposition, ways that China can exercise leadership in this arena and how world financial institutions can help mobilize climate finance from the private sector. These publications will all be published by CIGI in 2015.

ABOUT THE AUTHORS

Arunabha Ghosh is the CEO of the Council on Energy, Environment and Water (CEEW) (http://ceew.in), one of South Asia's leading think tanks. He has work experience in 36 countries and previously worked at Princeton, Oxford, the United Nations Development Programme (New York) and the World Trade Organization (Geneva). Widely published, Arunabha most recently co-authored *Climate Change: A Risk Assessment*, and the forthcoming *Human Development and Global Institutions*. He is a World Economic Forum Young Global Leader, founding board member of the Clean Energy Access Network, and board member of the International Centre for Trade and Sustainable Development (Geneva).

Anupama Vijaykumar is a post-graduate scholar at the Department of Geopolitics and International Relations, Manipal University. She was a climate change intern at CEEW during June–August 2015. Her areas of interest include the geopolitics of energy and climate change, domestic structures in environmental politics and intellectual property law. A law graduate, she aims to apply her knowledge to tackle issues related to climate governance, international law and the politics of negotiations.

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ACRONYMS

ASEAN	Association of South-East Asian Nations
CGIAR	Consultative Group on International Agricultural Research
COP	Conference of the Parties
EC	European Commission
GHGs	greenhouse gases
$GtCO_2eq.$	gigatonnes of carbon dioxide equivalent
HFCs	hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
IPRs	intellectual property rights
NOUs	National Ozone Units
ODS	ozone depleting substances
R&D	research and development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	UN Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization

EXECUTIVE SUMMARY

With halting progress in climate negotiations, there are growing calls for partnerships among self-selected pools of countries, in the expectation that they would facilitate consensus (among both developed and developing countries) and result in faster decision making. In critically examining such a claim, this paper asks: what kinds of partnerships could facilitate coordinated climate-related action across several countries? By focusing largely on technology partnerships (a key demand in climate negotiations), it examines characteristics of successful partnerships and the conditions under which they are created and sustained. While the motivations of existing partnerships are diverse, their functional scope has remained limited. A review of more than 30 initiatives reveals that very few had been designed to extend beyond sharing knowledge and some preliminary research and development (R&D) activities. Even fewer had enlarged functional focus on actual transfer of equipment, joint production or extensive deployment mandates.

The paper intensively analyzes the purpose, membership and governance of four partnerships: the Montreal Protocol; the Consultative Group on International Agricultural Research; the EC-ASEAN COGEN Programme;[1] and the C40 Cities Climate Leadership Group. These illustrative cases reflect how different design elements could facilitate effective technology diffusion and also reflect diversity across issues (agriculture and environment), regional focus (European Union and ASEAN) and levels of governance (C40 focus on cities). Drawing on their lessons, the paper identifies critical features — appropriate financing, leveraging capacity, flexible intellectual property rules and coordination across several institutions — which could become the foundation of new partnerships to deliver measurable action and possibly increase trust among negotiating parties.

INTRODUCTION

What kinds of partnerships could facilitate coordinated climate-related action across several countries? Every few years, climate negotiations go through peaks of anticipation followed by troughs of disappointment. Despite incremental progress in negotiations and with country-level actions, concentrations of greenhouse gases (GHGs) in the atmosphere remain at dangerous levels. This year, too, there is growing expectation that December's Conference of the Parties (COP) under the UN Framework Convention on Climate Change (UNFCCC) could deliver a new pathway for action on climate change that would involve all parties. There is also a concern that the sum total of the COP intended nationally determined contributions would not suffice to put a check on emissions to the extent required. Under the current policies and plans of the largest emitting countries and regions, global emissions will continue to rise for another few decades. The cumulative impact of this will result in a temperature rise well above the 2°C target that has informed the negotiations. The associated risks in terms of heat stress, water stress and crop failure will also exacerbate systemic stresses in terms of food crises, migration, state capacity for governance, and national and international security (King et al. 2015a). Is there a middle path between what countries could do unilaterally and an overarching climate agreement? Could groups of countries coordinate their actions on specific issues? Could such groups be flexible enough to include other countries or stakeholders? If so, what lessons could we draw from earlier attempts at technological partnerships within and outside the climate regime? Would such partnerships undermine multilateral climate agreements or bolster them?

This paper is driven by two motivations. The first is to examine the growing chorus of scholars and commentators suggesting that since climate negotiations have failed to deliver much in terms of action, negotiations and partnerships among smaller groups could offer a way

1 The EC-ASEAN COGEN Programme was an economic partnership dedicated to biomass cogeneration, initiated by the European Commission (EC) and Association of South-East Asian Nations (ASEAN), which ran from 1991 to 2005.

forward. The second is to examine the characteristics of successful partnerships and the conditions under which they are created and sustained. The paper argues that merely restricting group size may not be sufficient to deliver negotiated outcomes or eventual action on climate change. The purpose, membership and governance of any group matters. It also argues that there are certain desirable features of successful partnerships that could inform the design of new initiatives.

This paper largely (but not exclusively) focuses on technology partnerships because technology transfer (and associated financing) has been a key demand throughout the two decades of climate negotiations.[2] However, due to the prohibitive costs of technologies, intellectual property rights (IPRs) restrictions and continued lack of capacity for domestic R&D, among other reasons, there has been a persistent failure in facilitating the transfer of climate-friendly technologies. In response, smaller issue-focused technology partnerships have been proposed as an alternative and more effective route.

The first section of this paper discusses the strains on the climate regime and the kinds of negotiations that have not succeeded. In response, several scholars have suggested creating "climate clubs," but how feasible should we expect them to be? The next section identifies the range of climate-related partnerships that have emerged over the years. It finds that while the motivations for such partnerships are diverse, their functional scope has remained limited. The third section queries the form or design of partnerships, as often demanded in climate negotiations. It assesses four cases (including from outside the climate regime) — the Montreal Protocol, the Consultative Group on International Agricultural Research (CGIAR), the EC-ASEAN COGEN Programme, and the C40 Cities Climate Leadership Group — that were found to have delivered on one or more of these favoured design characteristics. This section also identifies the critical design and functional features that could form the foundation of new partnerships to deliver measurable action and possibly increase trust among negotiating countries.

THE QUEST FOR CONSENSUS: WHAT ARE THE ATTRACTIONS (AND FALSE TEMPTATIONS) OF CLUBS?

The international governance of climate change is being altered by new pressures and institutions. These have, in part, been a response to the questions that have been raised on the value of negotiating within a large group of countries. No doubt, 196 negotiating parties, each with a de jure, if not de facto, veto have made the difficult process of arriving at mutually agreeable outcomes unwieldy and glacial. Complex bargaining procedures involving countries with diverse interests and capabilities are bound to reach a gridlock (Victor 2015, 1). The regime complex of climate negotiations has become more obvious, with debates about decision making at the Group of Twenty, the role of the Montreal Protocol (for hydrofluorocarbons [HFCs], for instance), the Green Climate Fund's relationship with dozens of other climate-related funds, trade disputes at the World Trade Organization over promotion of clean energy, and so forth. Consequently, there is growing reliance on informal networks to break logjams in multilateral negotiations and develop consensus on policy issues, with concerns about their exclusivity.

If negotiating within large groups is a challenge, does the converse (small group negotiations) make it easier to promote international cooperation? William Nordhaus (2015, 1341) recommends climate clubs within which participants strive to achieve harmonious emissions reductions. Both state and non-state actors could constitute such clubs by working toward a common climate-related objective, such as energy access, energy efficiency or short-lived pollutants (Widerberg and Stenson 2013, xii; Ghosh 2014, 4). The idea is to focus on achievable targets using flexible mechanisms (Victor 2011a). The expectation is that cooperation through clubs could yield mutually advantageous outcomes, such as joint R&D in renewable energy technologies, or by linking emissions trading schemes among member countries/actors (Hovi et al. 2015, 10).

The real attraction of climate clubs is that they offer, in principle, a solution to the free-rider problem plaguing climate change.[3] Club membership entails incentives, such as access to goods, services or technologies that would not accrue to non-members. The idea is that club members would agree on a common goal, outline their contributions (conditional on others contributing as well) and put forward provisions to entice non-members or reluctant countries to join (Hovi et al. 2015, 3). The temptation for joining the clubs could be a result of both carrots (such as preferential market access) (Victor 2011b, 23) and sticks (tariffs and

2 Technology transfer and its various aspects, including transfer of knowledge, needs assessment and funding, are enshrined in Article 4 of the UNFCCC. Article 10 of the Kyoto Protocol also includes provision for transfer of technology from Annex I to Non-Annex I parties. Following COP 7, the Expert Group on Technology Transfer was established to implement the technology transfer framework under the UNFCCC. In 2007 at Bali, technology became one of the four pillars for what was then envisioned as the post-2012 agreement. Persistent failure in addressing the various challenges of technology transfer led to the creation of the Technology Mechanism in 2010. The mechanism includes two components: the Technical Executive Committee; and the Clean Technology Centre and Network. However, discord still exists between Annex I and Non-Annex I countries over the mechanism's design and mandate. There is also disagreement between the two groups whether the mechanism is responsible for technology diffusion or transfer, with Annex I countries favouring only the former.

3 Although some argue that this problem is overstated, its existence is undisputed. See Parson (2015).

countervailing duties imposed against non-members) (Nordhaus 2014).

Clubs can contribute to the overall climate regime in many ways. First, a willing coalition of a handful of large emitters could, in theory, be in line with the overall goal of stabilizing emissions in order to have a reasonable probability of staying within the 2°C limit. Second, the overall architecture of clubs and the benefits of membership could facilitate trust building and create the favourable national conditions to support a cooperative outcome at the Paris COP or in future (Ghosh 2014, 10). Third, clubs could play a pivotal role in operationalizing various specific initiatives discussed or approved under the UNFCCC, such as forest conservation via REDD+ (Reducing Emissions from Deforestation and Forest Degradation), or research in, and commercialization of, biofuels (Hovi et al. 2015, xix).

The purported advantages of climate clubs notwithstanding, there are at least three reasons to caution against excessive enthusiasm for small groups. The first is the temptation to build clubs around a small group of countries that might have substantial political, technological and financial resources. This approach assumes that other countries, without such resources, would have nothing to gain (if new technologies were developed) or lose (if trade barriers were imposed against non-members) (Ghosh 2010a). These countries would oppose initiatives that are perceived to be exclusionary. Second, it would be a mistake to ignore the fact that large developing-country emitters (which are often considered potential members of clubs) also have poor citizens for whom basic energy access is still a priority. These emerging economies have to balance the desire to be part of new technological initiatives (or to have a seat at the top table of negotiations) with core development imperatives, which still inform their political and economic priorities. Third, (artificial) coalitions of the willing will not work either. In recent years, an emphasis has been placed by developed countries on corralling small countries together to apply pressure on other large developing countries (for example, the Climate and Clean Air Coalition focused on short-lived climate pollutants). But without the membership of countries such as China or India, such coalitions would have little impact and, instead, serve to harden positions within formal negotiations. In short, the purpose, membership, design and governance of climate clubs would matter if they are to be successful.

THE QUEST FOR FUNCTION: WHAT KINDS OF CLIMATE PARTNERSHIPS HAVE EMERGED?

Partnerships in climate-related activities are not novel. Over the years, several technology partnerships and networks have been initiated. These partnerships were created as a result of wide-ranging motivations and were intended to perform diverse functions. These motivations range from the exchange of ideas and information through discussion to collaborative research, either of which may focus on a specific technology, region or governance level.

While the motivations for forming clubs might vary, technology itself is a spectrum of functions/outputs. Article 4 of the UNFCCC,[4] Article 10(c) of the Kyoto Protocol[5] and the 2000 edition of the special report by the Working Group III of the Intergovernmental Panel on Climate Change (IPCC)[6] all refer to the broad process of technology transfer in similar terms. These include the flows of know-how (or understanding), experience (or using the technologies) and equipment (replicating the technology) for mitigating and adapting to climate change. In order to evaluate the performance of existing partnerships in delivering technology transfer, we consider four specific activities or outputs: knowledge sharing and coordination; research, development and demonstration; technology transfer; and technology deployment mandates. Based on extant literature (de Coninck et al. 2007; Metz et al. 2007), the four activities have been defined as follows: knowledge sharing and co-ordination; research, development and demonstration; technology transfer; and technology deployment mandates.

Knowledge Sharing and Co-ordination

Knowledge-sharing forums primarily serve as common platforms for exchange of information. This exchange builds awareness about the opportunities, pros and cons of the technology in question (de Coninck et al. 2007). The participating entities may also take measures toward planning a common research agenda and/or harmonizing measurement standards toward facilitating technology transfer (ibid.).

Research, Development and Demonstration

This refers to collaborative research, which also often includes a joint funding mechanism and complementary arrangements that serve to enhance research outputs (ibid.). In the context of technology transfer, collaborative research, development and demonstration can be highly cost effective, help avoid duplication and usually addresses context specific issues and needs.

Technology Transfer

Technology transfer can broadly be classified into soft transfer and hard transfer. Soft transfer pertains to the transfer of know-how, information and skills, which

4 See UN (1992).

5 See UN (1998).

6 See Metz et al. (2000).

although similar to knowledge sharing and coordination is more tangible in the products delivered and often results in a trickle-down effect. Hard transfer, as the term suggests, involves the actual transfer of equipment and machinery, whether through imports or joint production (Dechêzlepretre, Glachant and Ménièr 2008).

Technology Deployment Mandates

Technology deployment mandates are aimed at facilitating faster diffusion of the technology. The mandates include, but are not limited to, performance standards, taxes and incentives in the form of subsidies (de Coninck et al. 2007).

The existing partnerships, on the basis of the above definitions, were analyzed to identify the range of outputs that each is designed to deliver (see Table 1).

As is evident from Table 1, very few partnerships have been designed to extend beyond knowledge sharing and a few R&D activities toward actual transfer of technology and/or eventual deployment. To the extent technology transfer is mandated within certain initiatives, very often they are associated with transfer of soft skills or establishing demonstration projects. Deeper experience in and understanding of what makes a technology partnership successful across the spectrum of expected deliverables is, as a result, lacking in many cases.

THE QUEST FOR FORM: WHAT DESIGN ELEMENTS ILLUSTRATE SUCCESSFUL PARTNERSHIPS?

As outlined above, despite the emergence of numerable climate partnerships, very few offer the prospect of genuine technology transfer, which is equitable and affordable and helps developing countries transition to clean technology. These deficiencies in the limited functions of climate partnerships are another reason why the urge to form climate clubs might not find easy takers from within developing countries. With rising emissions from the developing world, access to clean technology has never been more essential. But it is not merely access to technology that is demanded. Equally, there have been questions about the form or design of climate or technology partnerships.

The Group of 77 and China have, time and again, demanded a technology mechanism that would cater to the entire spectrum of outputs. But they have also outlined preferred design features in the partnerships, for greater technological and administrative effectiveness. A technology development fund to help strengthen global R&D, public-private partnerships on collaborative intellectual property systems, capacity development and knowledge platforms, technology transfer information systems and a clear management structure within the United Nations were the key elements of their 2013 submission on a technology facilitation mechanism.[7] The IPCC Working Group on Mitigation of Climate Change also envisaged international collaborative mechanisms for technology transfer along similar lines. The Working Group III in its 2007 report listed financial incentives for technology development, intellectual property rights and international collaboration on knowledge development and sharing as the key modes to strengthen technology-oriented partnerships (Metz et al. 2007).

If the aforementioned design elements were to be made operative, are there examples to draw on? Four case studies were chosen that embody several of these design elements: the Montreal Protocol; the Consultative Group on International Agricultural Research; the EC-ASEAN COGEN Programme; and the C40 initiative. These case studies were chosen because they reflect how the different design elements could facilitate effective technology diffusion in light of varying goals and different operating frameworks. To be sure, these are not the only examples of technology partnerships that have demonstrated elements of success. The cases are more illustrative, rather than comprehensive. But they also reflect diversity across issues (agriculture and environment), regional focus (European Union and ASEAN) and levels of governance (C40 focus on cities). The lessons drawn from the case studies could help formulate a skeletal design for new partnerships, which could be envisaged to break the climate gridlock.

Montreal Protocol: A Technology Fund That (Partially) Worked

Described by the former UN Secretary-General Kofi Annan as "the single most successful international agreement," the Montreal Protocol had a key role in the transfer of technologies to shift away from ozone depleting substances (ODS) (UN 2015). By December 2013, 453,771 tonnes of ODS had been phased out. Although not without flaws, the relative success of the protocol can, to a large extent, be attributed to the financial resources and governance structure of the Multilateral Fund for the Implementation of the Montreal Protocol (Green 2009). At the London Meeting of the Parties in 1990, an Interim Multilateral Fund was set up to assist developing countries whose ODS consumption was less than 0.3 kg per person per year; the Multilateral Fund was made permanent in 1994 (Multilateral Fund for the Implementation of the Montreal Protocol 2014b). As of November 2014, 45 countries had contributed more than US$3.26 billion to the fund. Since its inception, the fund has been replenished nine times over three-year time periods. The highest contributions were received in

7 See https://sustainabledevelopment.un.org/content/documents/1949Group77.pdf.

Table 1: Climate Partnerships — Motivations and Intentions

Partnership	Activity Type			
	Knowledge sharing and coordination	Research, development and demonstration	Technology transfer	Deployment mandates, standards and incentives
Forums for Discussion				
Clean Energy Ministerial	✓	×	×	×
Global Green Growth Forum (3GF)	✓	×	×	×
Major Economies Forum on Energy and Climate	✓	×	×	×
World Energy Council	✓	×	×	×
Forums for Research and Policy				
Asia-Pacific Partnership on Clean Development and Climate (concluded in April 2011)	✓	×	✓ (Project implementation)	×
Climate Technology Initiative under the International Energy Agency	✓	✓	✓ (Soft transfer)	×
Economic Community of West African States Centre for Renewable Energy and Energy Efficiency	✓	×	✓ (Soft transfer)	✓
Global Green Growth Institute	✓	×	×	×
International Renewable Energy Agency	✓	×	✓ (Soft transfer)	×
Renewable Energy Policy Network for the 21st Century	✓	×	✓ (Soft transfer)	×
Forums with a regional focus				
Asia-Pacific Economic Cooperation Energy Ministerial	✓	×	×	×
Baltic Sea Region Energy Cooperation	✓	×	✓	×
European Green Cities Network	✓	×	✓ (Demonstration)	×
Latin American Energy Organisation	✓	×	×	✓
Regional Centre for Renewable Energy and Energy Efficiency	✓	✓	×	✓
Renewable Energy Support Program for ASEAN	✓	×	×	×
US-Asia Pacific Comprehensive Energy Partnership	✓	✓	✓ (Soft transfer)	×
Forums for city-level action				
C40	✓	×	✓ (Soft transfer)	×
Cities Development Initiative for Asia	✓	×	×	×
Local Governments for Sustainability	✓	×	×	×
Forums with specific focus				
Carbon Sequestration Leadership Forum	✓	×	✓ (Soft transfer)	×
Clean Technology Fund of the World Bank	×	×	✓	×
Climate and Clean Air Coalition	✓	×	✓ (Soft transfer)	✓
Climate Technology Centres and Networks	✓	✓	✓ (Soft transfer)	×
EC-ASEAN COGEN Programme	×	×	✓ (Demonstration)	✓
Global Bio-energy Partnership	✓	×	✓ (Soft transfer)	×
International Framework on Nuclear Energy Partnership	×	✓	×	×
International Low Carbon Energy Technology Platform	×	✓	×	×
International Partnership for Energy Efficiency Cooperation	✓	×	×	✓
Renewable Energy and Energy Efficiency Partnership	✓	×	×	✓
UNFCCC Expert Group on Technology Transfer	✓	×	✓	✓

Source: Authors' analysis.

2003–2005 (US$474 million). It currently holds US$437 million for the 2015–2017 period (Multilateral Fund for the Implementation of the Montreal Protocol 2014d).

The governance structure of the Multilateral Fund strengthened its overall effectiveness. A 14-member executive committee ensured inclusivity by having equal representation from both developed and developing countries. The committee and the fund secretariat scrutinize the disbursement and reporting procedure, including project review, approval, disbursement, evaluation and review (Multilateral Fund for the Implementation of the Montreal Protocol 2014a).

However, one challenge has been the dependence on voluntary contributions to capitalize the fund, making it frequently prone to shortages. In fact, no party met its contribution requirements during 1994–2001 (Ghosh 2010b). Since the fund's executive committee lacks powers to impose sanctions for not meeting the contribution commitments, this remains a fundamental flaw with the Multilateral Fund (ibid.). There have been major disagreements between the developed countries and developing countries about the terms of funding. Where there was a possibility of financial returns from the investment projects, developed countries favoured conditional loans from the World Bank. Developing countries have opposed such moves, arguing for grants to cover the costs of transition (ibid.). The monitoring and evaluation system has also suffered from significant information gaps through delays in reporting and inflated project costs (ibid.).

Moreover, one of the fund's aims was to promote cooperation in research and development.[8] But the Montreal Protocol has not been entirely successful in creating collaborative intellectual property mechanisms. Since most of the research and development on ODS substitutes continues to be carried out by the private sector, many parties have faced significant challenges in gaining access to patented technologies (Chuffart 2013). The specific example of DuPont refusing to enter into commercial licensing agreements with domestic manufacturers in India and South Korea is a widely cited example illustrating the failure of the protocol in assisting with hard transfer of technology (Nanda 2009; United Nations Development Programme [UNDP] 2001).

The other key feature of the Montreal Protocol and the Multilateral Fund has been the coordination across several UN agencies. Four agencies, namely the UNEP, the UNDP, the United Nations Development Organization (UNIDO) and the World Bank, were designated as implementing agencies under the fund (Multilateral Fund for the Implementation of the Montreal Protocol 2014c). These agencies have, in turn, coordinated on specific tasks, including capacity building, knowledge sharing and supporting the national-level implementing agencies. The agencies with a global presence perform a handholding function, while filling the gaps in implementation of the procedures and compliance measures under the protocol. The implementing agencies also represent individual country interests at the executive committee meetings. And they assist countries with implementation, via capacity-building programs, assistance with policy making and formulation of country programs, and assistance with data reporting.

The implementing agencies also coordinate on knowledge transfer activities. The UNEP is responsible for soft technology transfer. It maintains an impressive repository of information on implementation of Montreal Protocol activities and scientific papers (UNEP Ozone Secretariat 2015). It has supported technology transfer through a combination of information exchange, networking, institutional strengthening, capacity building and training. The UNDP conducts feasibility studies, provides technical assistance and organizes demonstration and investment projects. UNIDO helps to "access, combine and sequence, different sources of environmental financing to meet compliance targets" (UNDP 2015). The actual transfer of technologies is done through investment projects and assistance through country programs (Multilateral Fund for the Implementation of the Montreal Protocol 2014c).

The National Ozone Units (NOUs), as the primary units of implementation, undertake activities at various stages of implementation such as designing public awareness campaigns and mobilizing support. Further, the NOUs are grouped together on a regional level. Networking among the NOUs serves as an effective vehicle for exchange of expertise and best practices, which helps improve domestic implementation of the protocol (UNEP 2014). Networking has also played a vital role in accelerating the ratification process, and with initial assistance for countries venturing into ozone legislation. The networks operate through the UNEP and are directly associated with the implementation processes under the protocol (Rasmusson 2002).

CGIAR: Balancing R&D and IPRs

CGIAR was founded in 1971 with assistance from the Ford and Rockefeller foundations. The group was put together in the wake of scientific concern regarding the looming global food crisis. The impetus came from stories of successful diffusion of high-yield variety seeds in Mexico, India and Pakistan. With the international community seeking to avert a possible food crisis, a network of research organizations was established with support from multilateral agencies, donor agencies and country governments. The network, which started out with four research centres (Correa 2009), has now

8 See United Nations Environment Programme (UNEP) Ozone Secretariat (2015, Article 10A).

expanded to 15 research centres[9] located across four continents addressing region-specific issues. The centres work in close collaboration with regional and national domestic institutions, farmer's collectives, academia and civil society organizations (CGIAR 2015a). The network of research centres further serves as an effective mechanism to cross-fertilize ideas and experiences. Through an effective interlocking of research, credit, finance, marketing and extension, the network managed to transfer technology and know-how to those who really needed it (Correa 2009).

The effectiveness of CGIAR is the result of its two core approaches: partnership and joint involvement in R&D; and striking a balance between generating international public goods and accommodating intellectual property concerns.

CGIAR has been at the forefront of creating international public goods in the field of agriculture, with a focus on easily accessible and globally available data. For instance, it maintains the world's largest collection of germplasm of all crops. The germplasm are maintained as a public good according to trust agreements signed with the Food and Agriculture Organization. These samples are made directly available to users for scientific research (CGIAR 2011).

Despite focusing initially on increasing food productivity, CGIAR has also evolved in its approach to R&D and intellectual property protection. It recognized that most of the technology and technical equipment for research on newer challenges, such as climate change, lay with the private sector, and was faced with the challenge of continuing to generate public goods while accommodating the intellectual property interests of its partners. Tapping into the interest shown by the private sector and academia to engage with it, CGIAR revised its defensive exclusive approach to patenting. The Intellectual Assets Policy adopted in 2013, outlines four means to restrict access to public goods generated by CGIAR centres.[10]

At the same time, CGIAR resorts to a number of innovative methods to lower intellectual property barriers, such as humanitarian use license. The Open Access Policy was adopted in 2013 to make information products[11] openly available. Thus, while a research centre can place restrictions on the purposes of developing and improving a product, the final output of the research would be available for use and public research. For instance, if a centre identifies a product, but has to approach a private sector player for further development, the centre may resort to a creative win-win arrangement such as exclusive marketing rights or time-limited ownership or marketing rights (CGIAR 2012).

Finally, the centres also often build upon patented processes or products. The owner of the IPR allows the centre to use the IPR on the condition that the use of the derived product is restricted. However, wherever possible, the product would ultimately contribute to improving food security and the restrictions are as limited as possible (ibid.). Further, in certain circumstances, a centre might itself file for the patent, so that it can assume the role of a licensor (ibid.). A centre might resort to charging fees in return for access. This is applicable to products, which are not held by the centre in trusts, under the International Treaty on Plant Genetic Sources for Food and Agriculture (ibid.).

EC-ASEAN COGEN Programme: From Knowledge to Demonstration to Policy

The EC-ASEAN COGEN Programme was an economic partnership dedicated to biomass cogeneration, which ran from 1991 to 2005. While the EC-ASEAN Programme was primarily intended to create a market for biomass equipment in the ASEAN countries, it also hoped to promote environmentally friendly technologies and reduce fossil fuel dependency (Lacrosse 2005). Through its phased approach, the main strength of the program was in building capacity, creating knowledge platforms, undertaking market needs assessments and facilitating policy frameworks for deployment and diffusion of environment-friendly technologies.

Phase 1 (1991–1994, known as COGEN 1) focused on assessing the potential for biomass cogeneration in the ASEAN countries. In light of the demand in the ASEAN market and the ability of European equipment suppliers to meet it, the program moved on to the demonstration phase. Under Phase 2 (1995–1998, known as COGEN 2), the program extended through to full-scale demonstration projects (EC 2006). These projects allowed the COGEN

9 Africa Rice Center, Biodiversity International, Centreo Internacional de Agricultura Tropical, Center for International Forestry Research, Centro Internacional de Mejoramiento de Maiz y Trigo, Centro Internacional de la Papa, International Center for Agricultural Research in Dry Areas, International Crops Research Institute for the Semi-Arid Tropics, International Food Policy Research Institute, International Institute of Tropical Agriculture, International Livestock Research Institute, International Rice Research Institute, International Water Management Institute, World Agroforestry Centre, World Fish Center (see CGIAR 2015b).

10 Under the CGIAR Intellectual Assets Policy, centres are able to: restrict access in order to improve research results or to assist with uptake and adoption; limit access to obtain third party products and services; register or allow third parties to register patent or plant variety rights protection on centre intellectual assets; and charge fees for providing access to intellectual assets (see CGIAR 2012).

11 Information products identified as: peer-reviewed journal articles; reports and other papers; books and book chapters; data and databases; data collection and analysis tools (e.g., models and survey tools); video, audio and images; computer software; web services (e.g., data portals, modelling online platforms); and metadata associated with the information products above (see CGIAR 2013).

Secretariat to choose the most feasible technologies, in terms of appropriateness, market relevance and presence of active companies in the region (Dewulf and Leelakulthanit 1997). On a case-by-case basis, chosen projects were given financial support up to 15 percent of the investment costs and plant operators were trained in Europe or ASEAN countries (ibid.). The last phase (2002–2005, known as COGEN 3) focused on accelerating implementation through joint ventures between Southeast Asian and European companies. An independent evaluation team regularly monitored the demonstration projects (ibid.).

The EC-ASEAN COGEN Programme also employed information dissemination as a strategic marketing and capacity-building tool. As a marketing tool, the program focused on collecting and disseminating any information, which would influence the decision making of investors and companies. The information databases were maintained at the regional level (ASEAN countries and Europe), as well as at the national level. Information was made accessible through other regularly updated means such as monthly newsletters and other business publications (ibid. 1997). Seminars, training and workshops were organized in ASEAN countries and a number of European countries: about 3,800 people, including NGO representatives, researchers, suppliers and officials benefitted (EC 2006).

The program also influenced, at least indirectly, a policy shift in favour of renewable energy in Thailand, Malaysia, Singapore and the Philippines (ibid.). Thailand instituted a renewable energy policy, the Philippines introduced a draft renewable energy bill and Singapore started work on its energy efficiency legislation. Smaller impact could be noted in Malaysia and Cambodia.

Despite the successful shift of policies, some failures plagued the program. Agro-industry-based demonstration projects were developed in only three countries; in other countries, projects failed to meet the COGEN deadline (ibid.). Even though the program was meant for the entire region, most of the resources were used in Thailand, Malaysia, Singapore, Indonesia and the Philippines (ibid.). Both COGEN 1 and 2 focused heavily on these countries leading up to smooth implementation of COGEN 3. Direct impacts generated by the program were also mostly focused on Thailand, Malaysia and Singapore, as there were ready investments available in these countries (ibid.). COGEN, however, successfully created a demand for biomass cogeneration equipment in ASEAN countries, resulting in significant environmental benefits.

C40: Networking for Results

The C40 Cities Initiative is one example of an issue-based climate partnership, which pulls together stakeholders from beyond the national government level. It is a consortium of mayors taking part in a collective effort to fight climate change at the level of cities. C40 started off as C20, a collective of 18 cities in 2005, at a conference of mayors convened by then mayor of London, Ken Livingston. Within a year of its inception, the network expanded to include about 40 cities, becoming the C40 (C40 Cities 2015b); the network currently includes 75 cities (C40 Cities 2015a). Network membership is envisaged at three levels on the basis of size, capability and level of involvement: megacities;[12] innovator cities;[13] and those granted observer status.[14]

Cities occupy about two percent of the global landmass, consume about two-thirds of the world's energy resources and account for about 70 percent of GHG emissions (C40 Cities Climate Leadership Group 2014). In many cities, mayors have a strong influence over key policies including building energy standards, urban planning and public transportation among others. The network, therefore, builds itself on the significant potential at the subnational level to take up action against climate change. A C40 report estimated that actions taken at the urban level could potentially reduce GHG emissions by 3.7 gigatonnes of carbon dioxide equivalent ($GtCO_2eq.$) below what national actions intend to achieve until 2030 and by 8.0 $GtCO_2eq.$ in 2050. These include efforts to build energy-efficient infrastructure, personal urban transport, waste management, and urban road freight transport (Bloomberg 2014). So far, 15 C40 cities have made public commitments to reduce GHG emissions by 80 percent by 2020 (ibid.). In short, the initiative focuses on local efforts that produce immediate results. The impact is subject to verification against measuring tools developed by the C40, which provide a solid basis for proceeding with further actions (C40 Cities Climate Leadership Group 2014).

C40 makes effective use of networking as a tool for information sharing and knowledge sharing (Lee 2014). The successful initiatives are tested and implemented at the local level and transmitted from city to city, through network and subnetwork connections (C40 Cities Climate Leadership Group 2014). Networking takes place at various levels among cities, between network and subnetworks, between businesses and networks, between networks and governments and so on (Hodson and Marvin 2010).

12 Addis Ababa, Athens, Bangkok, Berlin, Bogotá, Buenos Aires, Cairo, Caracas, Chicago, Delhi NCT, Dhaka, Hanoi, Ho Chi Minh City, Houston, Hong Kong, Istanbul, Jakarta, Johannesburg, Karachi, Lagos, Lima, London, Los Angeles, Madrid, Melbourne, Mexico City, Moscow, Mumbai, New York, Paris, Philadelphia, Rio de Janeiro, Rome, Sao Paulo, Seoul, Sydney, Tokyo, Toronto, Warsaw and Washington, DC.

13 Amsterdam, Austin, Barcelona, Basel, Changwon, Copenhagen, Curitiba, Heidelberg, Milan, New Orleans, Portland, Rotterdam, San Francisco, Santiago, Seattle, Stockholm, Vancouver and Yokohoma. For instance, Copenhagen acquired innovator city status when it initiated the Climate Action Plan for Carbon Neutrality, 2025.

14 Beijing, Oslo, Venice, Republic of Singapore, Nairobi, Dar es Salaam, Cape Town and Shanghai.

Cities are grouped together in subnetworks after the identification of priority areas with the greatest potential for emission abatement and climate action. There are seven issue-based subnetworks envisioned under the C40.[15] The subnetworks collect specific information and develop actions within their respective initiatives (C40 Cities Climate Leadership Group 2014). Subnetworking has facilitated division of labour and has averted the risk of the network collapsing under the burden of multiple challenges. Further, the structure including subdivisions enables tackling simultaneous challenges, which yield relatively quick solutions (ibid.). The network serves to transmit ideas and solutions where success stories from individual cities get adopted in other cities within the network. For instance, as of 2013, there were more than 170 bus rapid transport systems in the world, with significant emissions reduction potential. The first one, introduced in Bogota, is alone responsible for a reduction of a quarter of a million metric tonnes of carbon annually (Abdallah et al. 2013).

Despite its successes in a relatively short time span, there is definitely room for improvement with respect to inclusiveness within the C40 network (Bouteligier 2013). Even though the C40 involved an equitable and horizontal structure, benefits in the form of knowledge were not equally distributed among its members. Collaboration within the network was dependent on similar regional interests and climate change policy track record. Hence, the benefits were only accessible to a small section of the global urban populace (Lee 2014). Smaller cities in the periphery were often left out. While it is on the agenda for the network to assist developing cities with futuristic planning (C40 Cities Climate Leadership Group 2014), creative strategies such as subnetworking (Lee 2014) (on the basis of regions or level of policy development) and venues for collaboration between the various levels of membership need to inform the next stage of the C40's evolution to ensure that a broader range of cities can participate.

Key Lessons for Building New Partnerships

How could the attractions of clubs, the range of functional activities and the desirable forms of climate partnerships help in designing new initiatives? For one, any new initiative must be inclusive in membership, recognize the needs of poor countries and the poor within emerging economies, and involve a critical mass of relevant economies or actors on a particular issue, in order not to add to the atmosphere of mistrust in climate discussions. Moreover, the most effective partnerships are those that are not only restricted to knowledge sharing or limited R&D, but extend their functional scope to include (soft or hard) technology transfer and wider deployment and diffusion of improved technologies.

Furthermore, each of the cases discussed above demonstrates one or more of the preferred design features, as demanded by developing countries. But it is in their deficiencies that we can find ways to improve the designs. At least four lessons can be drawn to improve the form and design of climate partnerships.

First, even a relatively successful mechanism, such as the Montreal Protocol's Multilateral Fund, underscores the need for upfront funding commitments and results-based disbursement. Without certainty that the needed funds would be available, no country or business would wish to invest in deploying new technologies. Reliance on voluntary contributions creates uncertainty, but insistence on paid-up commitments might restrict the number of donors willing to make such promises. In other words, financial needs assessments would be as important as technical needs assessments.

Second, the cases demonstrated that flexibility in intellection property provisions helps to protect private innovators, but also allows for partnerships to evolve and respond to changing technological needs over time. For instance, while the original Montreal Protocol sought to promote the shift away from chlorofluorocarbons to HFCs and hydrochlorofluorocarbons, the latter set of chemicals has high global warming potential. Several countries have proposed amendments to the protocol to phase out HFCs by replacing them with entirely new sets of chemical alternatives. Unless the IPR provisions evolve alongside, it would be difficult to secure support among many member states, who might argue against purchasing new chemicals whose side effects might be also unknown.

Third, capacity development and contributions to technology partnerships go hand-in-hand. In many cases, it is observed that much of technology or investments in demonstration projects go to a subset of members. To be inclusive and effective, partnerships have to invest in the capacity of their weaker members. Also, members need not have to contribute in hard currency terms alone. In-kind contributions of research staff, facilities, land for demonstration projects, and so forth, could be ways in which the contributions of all members are recognized and duly rewarded. A simple rule of thumb, say, contributions toward the technological effort as a known share of GDP, would be both inclusive and progressive in the amounts of funds or other contributions raised. For instance, the Global Apollo Program (aimed at increasing energy R&D investments in specific areas, such as storage) envisages a funding mechanism where participating governments in the consortium pledge an annual average of 0.02 percent of their GDP as public expenditure on the program from 2016 to 2025, to be spent according to each country's own discretion (King et al. 2015b, 8).

15 These are: Adaptation and Water; Energy; Finance and Economic Development; Measurement and Planning; Solid Waste Management; Sustainable Communities; and Transportation.

Fourth, in a world characterized by a regime complex of climate-related institutions, coordination among various networks and official UN agencies is paramount. The Montreal Protocol is a good example of a clear division of labour between four implementing agencies. The lesson from both the EC-ASEAN COGEN Programme and the C40 initiative is that networks are likely to have more impact when they support their weaker members to gain access to knowledge, experience, know-how and technology. In future, it is unlikely that technology partnerships will be solely driven by UN agencies or informal networks. It will be important to design partnerships in such a manner that the most important assets and resources of different actors and institutions are made available for the group's benefit.

CONCLUSION

Process matters in international negotiations. Countries need to believe that they have a meaningful role and are not being asked to merely rubber stamp a deal struck elsewhere. For issues to be linked and partnerships formed, negotiators and their principals need to learn about their counterparts' interests. Small group negotiations could offer the forum for such deliberation but they need to be open-ended and inclusive enough so that opportunities for linkages with other countries are not missed.

This paper has argued that fixing climate governance through technology partnerships requires understanding the solutions and challenges in the quest for consensus (among group members), the quest for function (so that members derive genuine value from the partnership) and the quest for form (so that the design of any initiative has the elements to raise confidence that it can deliver on the promised activities and outcomes). The paper recognizes that the urgency of climate change means there is also a quest for action across several countries and other stakeholders, which could draw on these lessons of membership and consensus building, of function and of form. It has proposed and offered basic design elements that should be followed by any new partnership in order to have meaningful impact.[16]

16 Two new partnerships — on energy access and energy storage — are proposed in Ghosh and Ray (2015, forthcoming).

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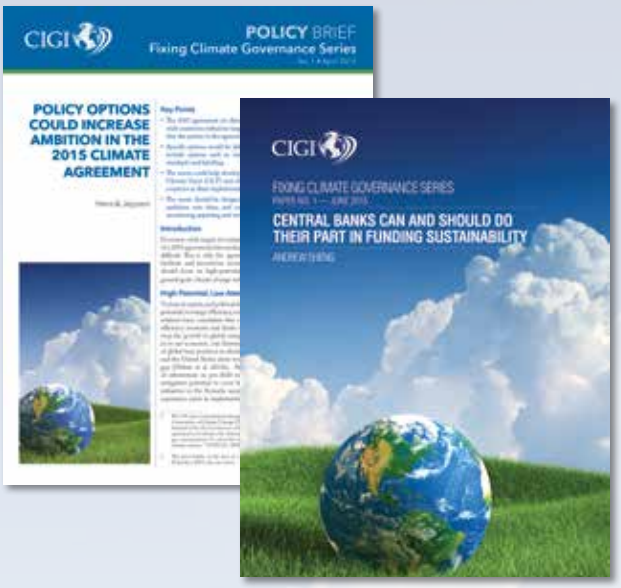
Fixing Climate Governance Series



The Fixing Climate Governance project is designed to generate some fresh ideas. First, a public forum was held in November 2013. High-level workshops then developed a set of policy briefs and short papers written by experts. Several of these publications offer original concrete recommendations for making the UNFCCC more effective. Others make new proposals on such topics as how to reach agreements among smaller sets of countries, how to address the problems of delayed benefits from mitigation and concentrated political opposition, ways that China can exercise leadership in this arena and how world financial institutions can help mobilize climate finance from the private sector. These publications will all be published by CIGI in 2015.

Policy Options Could Increase Ambition in the 2015 Agreement

Fixing Climate Governance Policy Brief No. 1
Henrik Jepsen

Economy-wide targets for emissions reductions will be an indispensable element of a 2015 agreement, but reaching agreement on ambitious targets is notoriously difficult. It needs to include a mechanism that can facilitate and incentivize increased ambition over time, and which focuses on high-potential policy options that contribute to the same general goal: climate change mitigation.

Conducting Global Climate Change Negotiations: Harnessing the Power of Process

Fixing Climate Governance Policy Brief No. 2
Kai Monheim

Process itself — over and above the issues at stake — is a key determinant of negotiation success across all levels of climate change negotiation groups in the United Nations Framework Convention on Climate Change. The author offers six axioms for chairs of negotiation groups that may lead to finding common ground and avoiding deadlocks: brokering compromise while remaining as transparent and inclusive as possible; enhancing influence by acting impartially and recognizing cultural differences; managing the agenda to create momentum while clustering, prioritizing and linking issues; focusing debate using the chair's information advantage; steering individual negotiation sessions in a time-efficient way; and building trust by creating sheltered negotiation spaces that allow for frank and constructive dialogue.

Available as free downloads at www.cigionline.org

Six Ways to Make Climate Negotiations More Effective

Fixing Climate Governance Policy Brief No. 3
Pamela Chasek, Lynn Wagner and I. William Zartman

This policy brief proposes six changes that could improve the negotiating process and facilitate consensual outcomes. These include using a single negotiating text; discontinuing "on-screen" negotiations; eliminating the norm that "nothing is agreed until everything is agreed" and dividing the climate change problem into pieces that may be more readily acceptable; giving negotiating roles to ministries besides foreign affairs; establishing a group of states to play the "regime-builder" role; and employing the leadership skills necessary to make this all happen.

Focus Less on Collective Action, More on Delayed Benefits and Concentrated Opponents

Fixing Climate Governance Policy Brief No. 4
Edward A. (Ted) Parson

Controlling climate change has significant collective-action aspects, but the importance of these has been exaggerated and efforts misdirected as a result — particularly regarding the feasibility and impact of leading actions to pursue large emission cuts by individual nations or subgroups. Serious climate action must confront other challenges, most importantly, delayed benefits and concentrated opponents. This policy brief sketches several specific approaches to addressing these challenges, which can be pursued nationally or internationally.

Central Banks Can and Should Do Their Part in Funding Sustainability

Fixing Climate Governance Paper No. 1
Andrew Sheng

Central banks, when purchasing financial assets, should consider selecting assets that will promote sustainability, including climate change mitigation and adaptation. Central banks not yet ready to factor social objectives into their decisions should at least incentivize bankers and asset managers to invest in climate mitigation activities and low-emission growth, as well as support a financial transaction tax to fund a new or established global fund for climate mitigation.

CIGI PUBLICATIONS
ADVANCING POLICY IDEAS AND DEBATE

Growth, Innovation and Trade in Environmental Goods

CIGI Policy Brief No. 67
Céline Bak

Reporting on global trade in environmental goods would provide a comprehensive lens into diversification that will be needed for the transition to low-carbon economies, help countries benchmark the shorter- and longer-term impact of policies such as regulation and fiscal stimulus targeted at green growth, as well as innovation, and strengthen the G20 leaders' commitment to inclusive and sustainable growth by providing visibility into the pace of investments to address climate change.

The Environmental Goods Agreement: A Piece of the Puzzle

CIGI Papers No. 72
Patricia M. Goff

Can a trade agreement help achieve environmental goals? This paper explores the potential of the Environmental Goods Agreement (EGA) to produce a more positive outcome than previous attempts at environmental chapters within trade agreements. The EGA, while met with challenges, is an important piece of a complex environmental governance puzzle. The question is not whether the EGA will have an impact, but how much of an impact.

Global Treaty or Subnational Innovation? Canada's Path Forward on Climate Policy

CIGI Policy Brief No. 66
Sarah Burch

Canada's position on climate change is deeply contentious and constantly evolving, and presents a challenge of multi-level governance (across sectors, civil society and multiple levels of government). This policy brief describes examples of innovative climate change policy at the subnational level, articulates the roles played by different levels of government, and provides a series of recommendations on pathways to carbon-neutral, resilient communities.

Development of Sustainability and Green Banking Regulations

CIGI Papers No. 65
Adeboye Oyegunle and Olaf Weber

Interest in sustainable and green financial regulations has grown in recent years due in part to increasing climate-change risks for the financial sector alongside a need to integrate this sector into the green economy. This paper recalls sustainability's course from fringe issue to central concern, and examines seven countries, all emerging and developing, where regulatory approaches have been implemented successfully.

The Impact of Financial Sector Sustainability Regulations on Banks

CIGI Papers No. 77
Olaf Weber and Olawuwo Oni

This paper analyzes the impact of three financial sector sustainability regulations: the Chinese green credit guidelines, the Nigerian Sustainable Banking Principles and the Bangladesh Environmental Risk Management Guidelines. All three address the connection between financial sector activities and sustainable development, and develop guidelines for sustainable banking policies, strategies, practices, products and services.

Submission to Ontario's Climate Change Discussion Paper 2015

Special Report

The International Law Research Program (ILRP) of the Centre for International Governance Innovation (CIGI) responds to select questions from Ontario's Climate Change Discussion Paper 2015, as part of a province-wide public consultation process by the Ministry of the Environment and Climate Change.

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The Centre for International Governance Innovation is an independent, non-partisan think tank on international governance. Led by experienced practitioners and distinguished academics, CIGI supports research, forms networks, advances policy debate and generates ideas for multilateral governance improvements. Conducting an active agenda of research, events and publications, CIGI's interdisciplinary work includes collaboration with policy, business and academic communities around the world.

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Le CIGI a été fondé en 2001 par Jim Balsillie, qui était alors co-chef de la direction de Research In Motion (BlackBerry). Il collabore avec de nombreux partenaires stratégiques et exprime sa reconnaissance du soutien reçu de ceux-ci, notamment de l'appui reçu du gouvernement du Canada et de celui du gouvernement de l'Ontario.

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