

DIW Weekly Report

A policy bulletin from the German Institute for Economic Research

32²⁰²¹

Economy. Politics. Science.

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229 Report by Heiner von Lüpke, Charlotte Aebischer, and Karsten Neuhoff

Collective action: new guiding principles for International Climate Finance

- International Climate Finance should follow principles of global cooperation
- Donor countries should combine financial support with own climate actions
- Technical cooperation and knowledge exchange can increase trust

LEGAL AND EDITORIAL DETAILS



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Volume 11 August 13, 2021

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Layout

Roman Wilhelm, Stefanie Reeg, DIW Berlin

Cover design

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Composition

Satz-Rechen-Zentrum Hartmann + Heenemann GmbH & Co. KG, Berlin

ISSN 2568-7697

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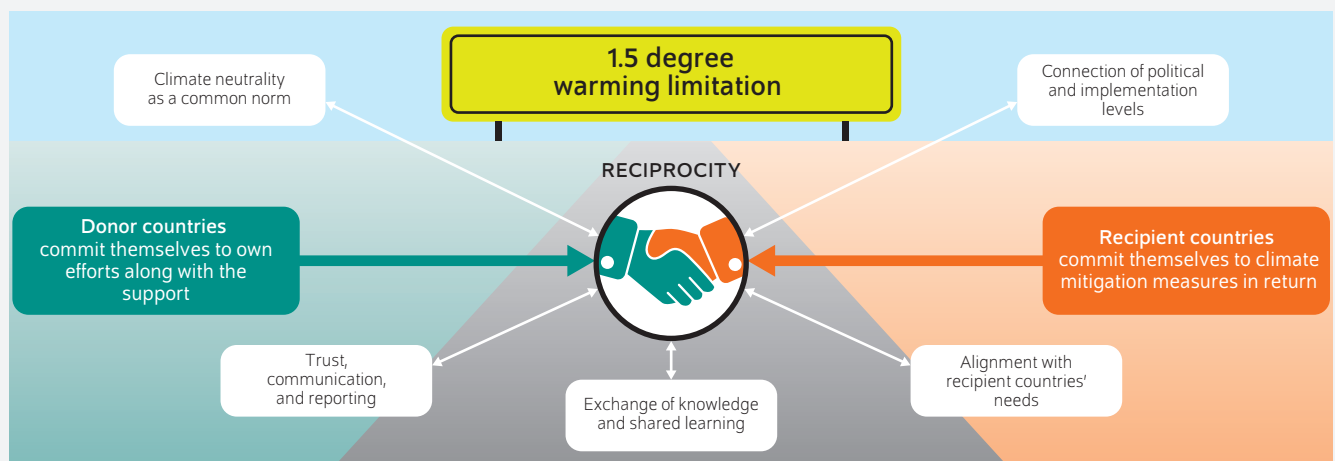
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Collective action: new guiding principles for International Climate Finance

By Heiner von Lüpke, Charlotte Aebischer, and Karsten Neuhoﬀ

- International financial support for developing countries is necessary to achieve climate targets
- Expert interviews show strength and weaknesses of different International Climate Finance concepts
- International Climate Finance should adhere to the principles of global cooperation in the climate commons instead of on purely incentive-based measures
- Reciprocity should be of central importance: donor and recipient countries should combine financial support with own climate actions
- Trust between donor and recipient countries can be increased by knowledge exchange and technical cooperation

On the path to climate neutrality: recommendations for improving International Climate Finance



Source: Authors' own depiction.

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FROM THE AUTHORS

"Climate change requires the international community to design support systems for developing countries more efficiently. If reciprocity of climate contributions, knowledge exchange, and a focus on the needs of the partner country are at the core of this support, it can accelerate the transition to climate neutrality."

— Heiner von Lüpke —

MEDIA



Audio Interview with Heiner von Lüpke (in German)
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Collective action: new guiding principles for International Climate Finance

By Heiner von Lüpke, Charlotte Aebischer, and Karsten Neuhoﬀ

ABSTRACT

To limit global warming to 1.5 degrees Celsius, it is necessary for industrialized countries to support developing countries financially. The channels and mechanisms under which this support would be provided are known as International Climate Finance. Building upon expert interviews with a focus on the industrial sector, this report analyses the different areas of International Climate Finance and suggests ways for increasing its efficiency. International Climate Finance currently strongly builds on traditions of development cooperation and aims at creating incentives and providing support for greenhouse gas mitigation efforts in recipient countries. This report suggests modifying International Climate Finance on the basis of Elinor Ostrom's principles of global cooperation. One of these principles is reciprocity of mitigation efforts: donor countries combine their financial support of recipient countries with domestic climate policy goals. Knowledge exchange and technical cooperation could strengthen mutual trust and increase social consciousness in donor and recipient countries. Were International Climate Finance instruments to be redesigned according to these principles, they could legitimize stronger national steps to CO₂ mitigation and support an international dynamic that could accelerate the transition to climate neutrality.

With a newly elected Biden administration in the United States, opportunities to strengthen climate cooperation sustainably at the 2021 United Nations Climate Change Conference in Glasgow are emerging. At the G7 and G20 summits this year, the member countries reinforced their Paris Agreement pledges, which include funding commitments of 100 billion USD per year by 2020 for developing countries. Germany and the United Kingdom announced an additional several hundred million euros to alleviate the impact of climate change in developing countries.¹ The United Kingdom holds the presidency of the 2021 UN Climate Change Conference in Glasgow and has set the goal of raising international climate finance pledges to the level needed to achieve global carbon neutrality.²

Although the pledges made in the first half of 2021 represent an important step, there are still major deficits in the area of International Climate Finance (ICF) with regard to the effectiveness, transparency, and reliability of financial pledges for mitigation as well as adaptation.

While frequently cited statistics show increasing payments (Figure 1), representatives of developing countries, non-governmental organizations, and academics criticize the high proportion of loans as well as a lack of agreement on definitions and indicators.³

The important role of ICF raises the question of whether current approaches to climate finance, which are mainly based on development cooperation mechanisms, are consistent with the principles for global climate change cooperation in Ostrom's sense of collective action.

¹ "G7 summit: Leaders pledge climate action but disappoint activists," *BBC*, June 13, 2021 (available online; accessed July 28, 2021; this applies to all other online sources in this report unless stated otherwise).

² Cf. Information on the website of the Glasgow conference (available online).

³ J. Timmons Roberts et al., "Rebooting a failed promise of climate finance," *Nature Climate Change* 11 (2021): 180–182.

Approaches and controversies in International Climate Cooperation

Approaches to international climate cooperation date back to the early stages of international climate policy and were already reflected in the 1992 United Nations Framework Convention on Climate Change (UNFCCC). These approaches include the idea of carrying out efforts to mitigate climate change not only unilaterally, but in cooperation with other countries as well. In addition, there was the obligation for industrialized countries to support developing countries through financial, technological, and capacity-building measures.⁴

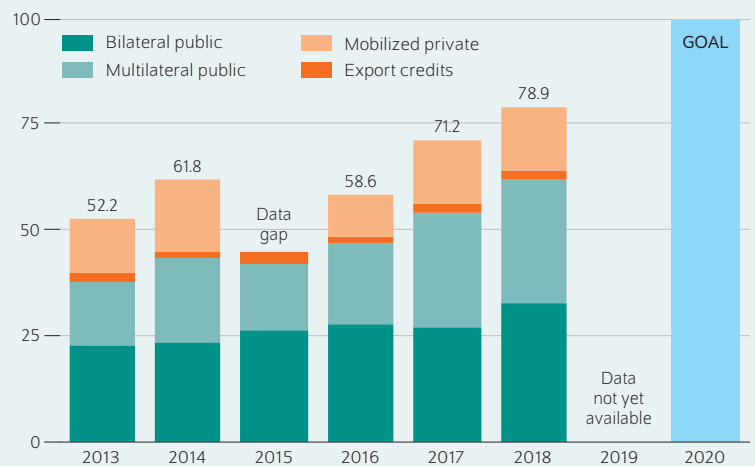
With the adoption of the Kyoto Protocol in 2006, the first approach evolved into a system of international emissions trading, whereby the Clean Development Mechanism (CDM) enabled industrialized countries to count greenhouse gas emission reduction projects in developing countries toward their own climate targets. While the 2015 Paris Agreement provides for a continuation of the CDM as a “mechanism to avoid greenhouse gas emissions and stimulate sustainable development,” this mechanism may lead to conflicts of interest with national policies and the development of national climate targets,⁵ which is why no international implementation methods have yet been agreed upon.⁶

In addition to the established cooperation mechanisms, there were also suggestions for sector approaches in the form of cross-border cooperation focusing on certain sectors.⁷ Along those lines, transnational agreements at a sector level—for example, the steel or cement sectors—should create conditions for increased cooperation on emissions reduction. However, these approaches focused mainly on CO₂ pricing agreements involving minimum prices or joint emissions trading. The motivation was often to improve the national implementation of such policies to minimize the risk of displacing production and jobs.⁸

Taking an economic perspective, such approaches were further developed into climate clubs.⁹ In the negotiations on the United Nations Framework Convention on Climate Change (UNFCCC), however, such minilateralist top-down

Figure 1

Climate finance provided and mobilized (2013 to 2018) In billion USD



Source: OECD.

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Since 2013, financial support for climate policies and measures in developing countries has increased steadily, but has not yet reached the target level

approaches have not yet succeeded.¹⁰ For one thing, countries differ in their economic situation. Thus, they each have different ideas on appropriate CO₂ price levels and climate policy must be weighed differently in each case, as well as in regard to market-based approaches in the policy mix. Furthermore, there is no institutional framework for a common design for CO₂ pricing on an international level. The necessity of such frameworks is shown by the challenges that even the comparably strong EU institutions face when attempting to make clear political decisions on the European Emissions Trading System. Against this background, designing CO₂ pricing should be considered as a national (or EU) regulation in the medium term;¹¹ this would enable progress in other fields of global climate policy unburdened by the complexities of CO₂ pricing.

The second approach, the idea that industrialized countries provide support for developing countries, has played a major role in the negotiations on the global climate agreement since 2007. While developing countries had not assumed responsibility for their own mitigation actions under the Kyoto Protocol, the principle of common but differentiated responsibility for mitigation actions guided future agreements: beginning in 2020, industrialized countries are to provide 100 billion USD annually to support developing countries in mitigation and adaptation actions. This

⁴ Cf. information on the website of the United Nations Framework Convention on Climate Change (available online).

⁵ First, a country will announce as few emission reductions as possible of its own accord if it can “sell” additional emission reductions internationally. A CDM thus torpedoes the process of gradually tightening climate targets worldwide. Second, climate neutrality can only be achieved when emissions in all regions are largely avoided and not just offset by a CDM.

⁶ Kelley Kizzier, Kelly Levin, and Mandy Rambharos, *What You Need to Know About Article 6 of the Paris Agreement. Commentary* (World Resources Institute: 2019) (available online).

⁷ Jake Schmidt, Ned Helme, Jin Lee, and Mark Houdashelt, “Sector-based approach to the post-2012 climate change policy architecture,” *Climate Policy* 8, no. 5 (2008): 494–515.

⁸ Ian Perry, Simon Black, and James Roaf, “Proposal for an International Carbon Price Floor Among Large Emitters,” IMF Staff Climate Note, June 18, 2021 (available online).

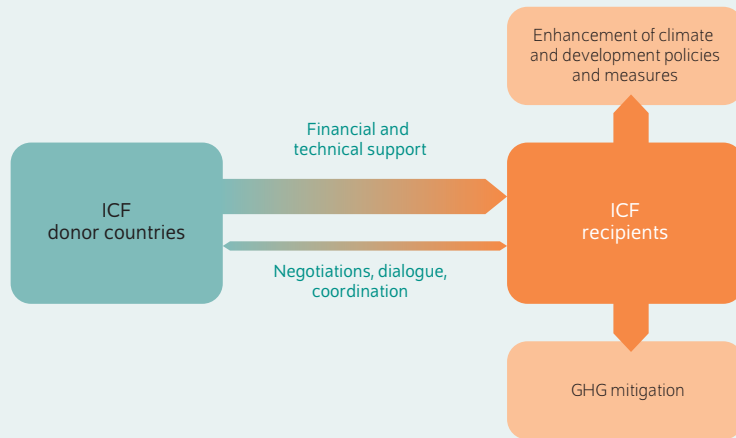
⁹ Climate clubs are coalitions of countries that work together to achieve the goal of decarbonization by establishing club rules, a mix of punishments for members who do not adhere to the rules and benefits for those who do. Cf. William Nordhaus, “Climate Clubs: Overcoming Free Riding in International Climate Policy,” *American Economic Review* 105, no. 4 (2015): 1339–1370.

¹⁰ Minilateral approaches only include subgroups of countries that participate in the UNFCCC process. In the case of climate clubs, these are countries with similar political interests.

¹¹ For potential design options, please see Karsten Neuhoff et al., “Closing the Green Deal for Industry—what design of a border carbon adjustment mechanism ensures an inclusive transition to climate neutrality,” *Climate Strategies Position Paper* (2021) (available online).

Figure 2

Present system of unilateral climate finance support from donor countries to recipient countries



Source: Authors' own depiction.

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Currently, the ICF system is oriented according to the principles of development cooperation.

is also reflected in most developing countries' Nationally Determined Contributions (NDCs), in which these countries declare their willingness to increase their climate change targets beyond pledged levels provided they receive support from industrialized countries to do so. In this context, it was always a core concern of the developing countries to receive support not only for mitigation, but also for climate adaptation measures, as the industrialized countries have historically been responsible for the major bulk of emissions and

for the related negative consequences for developing countries (Figure 2).¹²

This support is mostly implemented according to the principles of international development cooperation, meaning it is demand driven and serves to provide direct technical and financial support for climate policy measures in the recipient countries.¹³ Central to this are principles such as national ownership over the nature and objectives of the measures in the recipient country and the alignment of donor and recipient countries' systems, policies, and institutions. These transfers of support are characterized by the bottom-up principle. The question is, however, whether these established principles of development cooperation are also suitable to address the greatest challenge of international climate cooperation, to enhance collective action in the climate commons: without common rules, there is little incentive for individual countries to conserve the common resource of the world's climate at their own expense.

Reciprocity and trust as a new approach for International Climate Finance

Nobel Prize winner Elinor Ostrom analyzed the factors which can contribute to overcoming the "tragedy of the commons" in the context of international climate policy.¹⁴ These factors were combined with more recent findings from the research approach she initiated.¹⁵

The factors include the reciprocity of climate change contributions by states, trust, communication, international learning communities, and transparency. They are supplemented by an international multi-level approach, the creation of norms, and an agreement on a fair set of rules.¹⁶ Together, they provide the basis for cooperation in combating climate change (Table 1). An analysis framework was constructed to evaluate the existing approaches using the factors for global cooperation (Figure 3). Data for this analysis were collected through a literature review and sixteen semi-structured expert interviews.

Table

International cooperation factors for protecting the climate as a global common good

Factor for global cooperation	Description
Development of norms and soft forms of sanctions	Norms as central factor for the decisions of actors. Non-compliance can result in social sanctions.
Reciprocity	Participating states contribute to the international climate in an appropriate manner: this can be done most effectively when governments trust that their climate actions will be mirrored by corresponding actions of other governments.
Trust, rules, and transparency	These factors are considered the basis for the emergence of trusting interstate relations, which in turn can lead to cooperation.
Facilitation of experimentation and learning	International learning and policy diffusion are important in solving complex environmental problems. Experimenting supports learning and creating solutions.
Multi-level approach and orientation according to national conditions	International top-down approaches have proven to be ineffective. Bottom-up approaches with a minimum of top-down control are more effective. In this way, countries retain a certain minimum level of national responsibility.

Source: Authors' own research.

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¹² Lisa Schipper, "Conceptual History of Adaptation to Climate Change under the UNFCCC," *Review of European Community and International and Environmental Law* 15, no. 1 (2006): 82–92; Harald Winkler, Brian Mantlana, and Thapelo Letete, "Transparency of action and support in the Paris Agreement," *Climate Policy* 17, no. 7 (2017): 853–872.

¹³ Sāni Ye Zou and Stephanie Ockenden, "What Enables Effective International Climate Finance in the Context of Development Co-operation?" OECD Development Co-operation Working Papers 28, 2016.

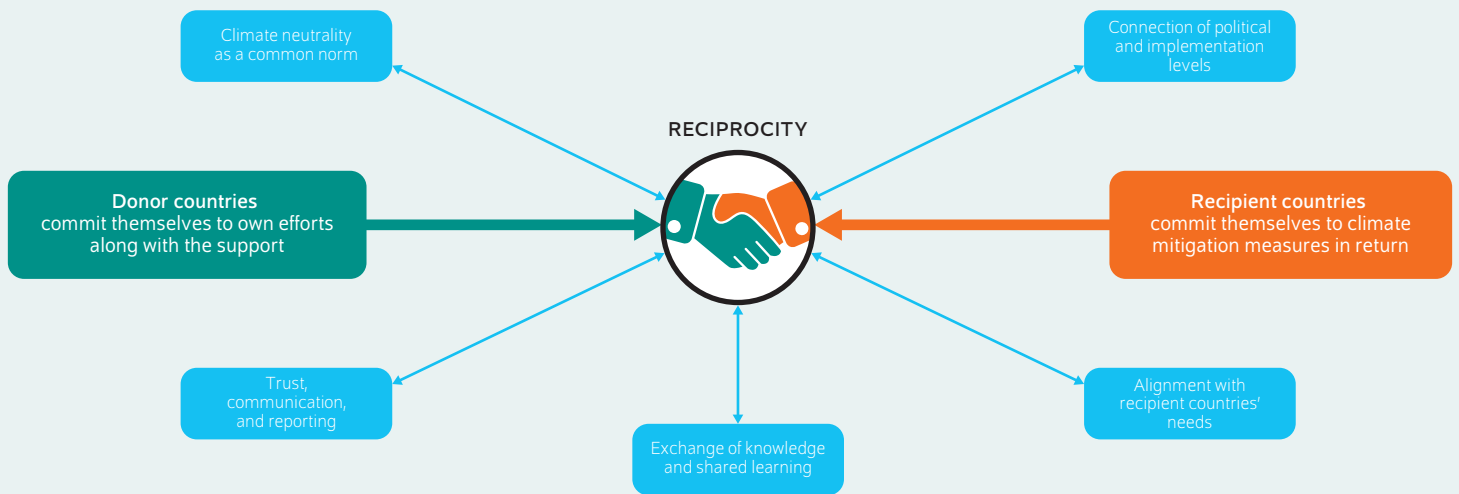
¹⁴ Elinor Ostrom, "A General Framework for Analyzing Sustainability of Socio-Ecological Systems," *Science* 325, no. 5939 (2009): 419–422; Elinor Ostrom, "Polycentric systems for coping with collective action and global environmental change," *Global Environmental Change* 20, no. 4 (2010): 550–557.

¹⁵ For example, Stefano Carattini, Simon Levin, and Alessandro Tavoni, "Cooperation in the Climate Commons," *Review of Environmental Economics and Politics* 13, no. 2 (2019): 227–247; Maximilian Högl, "Enabling Factors for Cooperation in the Climate Negotiations: a Comparative Analysis of Copenhagen 2009 and Paris 2015," *Deutsches Institut für Entwicklungspolitik Discussion Paper* 14 (2018).

¹⁶ Marcel J. Dorsch and Christian Flachsland, "A Polycentric Approach to Global Climate Governance," *Global Environmental Politics* 17 (2017): 45–64.

Figure 3

Elements for a reform of International Climate Finance



Source: Authors' own research.

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When oriented according to the principles of global cooperation, the reciprocity of climate contributions, trust, transparency, and common norms are at the center of International Climate Finance.

From the results of the analysis, a qualitative approach was chosen to build a narrative explaining how addressing the factors of global cooperation on climate change can lead to greater effectiveness of ICF approaches.

Steel sector so far not sufficiently included in climate change

The steel sector accurately illustrates the cooperation opportunities described above. The steel industry, which is responsible for seven to nine percent of global carbon emissions,¹⁷ is primarily characterized by capital-intensive production as well as a transnational orientation.¹⁸ In addition, there is intense competition and a great many suppliers within the sector. A climate-neutral design for the steel sector includes switching to climate-neutral production processes, using steel more efficiently, and further improving recycling processes. However, climate-neutral production processes incur higher costs, also in the medium term, compared to conventional production processes.¹⁹ Thus, effective policy frameworks, as are currently being discussed intensively at the German and EU level, are needed for the transition to climate neutrality.

The analyses of the steel sectors in India, South Africa, and the EU²⁰ have shown that previous technological advances, as well as a major share of research on climate-neutral production, have taken place within the EU.²¹ Multinational companies such as ArcelorMittal or Tata Steel focus their decarbonization efforts on respective European production sites. In India and in South Africa, TataSteel India and ArcelorMittal South Africa make their efforts dependent on the further development of national climate policies and the support of the European company division. Other domestic Indian firms set lower targets, by, for example, not aiming for climate neutrality at all.²²

At a political level it can be observed in all of the countries that steel (and industry²³ as a whole) has not been sufficiently involved in determining nationally appropriate climate contributions.²⁴ Although India introduced a certain number of measures (such as Pat-and-Trade (PAT)), South Africa implemented a carbon tax for industry, and the EU presented the EU Green Deal and a new industrial strategy

²⁰ India, South Africa, and the EU were chosen due to the project within which this study was written. Furthermore, these three cases provide an interesting basis of comparison regarding the implementation of carbon mitigating measures. An analysis of China's steel sector would be a logical addition for further research.

²¹ Valentin Vogl et al., *Green Steel Tracker* (2021) (available online).

²² Tamiksha Singh et al., "Transitioning India's Steel and Cement Industries to Low Carbon Pathways," SNAPFI country study, 2020 (available online).

²³ Industry here refers to the World Bank definition and includes mining and quarrying, manufacturing, construction, and public utilities (electricity, gas, and water).

²⁴ Zoha Shawoo and Oliver Johnson, *Industry transitions: a critical gap in national climate commitments* (Stockholm Environment Institute: 2019) (available online).

¹⁷ World Steel Association, "Steel's Contribution to a Low Carbon Future and Climate Resilient Societies." Worldsteel Position Paper, 2020 (available online).

¹⁸ World Steel Association, *World Steel in Figures* (2020) (available online).

¹⁹ Material Economics, *Industrial Transformation 2050—Pathways to Net-Zero Emissions from EU Heavy Industry* (2019) (available online).

in 2020, the incentives and framework for the steel industry remain insufficient for achieving climate-neutral production. International Climate Finance can provide significant assistance here.

International Climate Finance can become more effective by following global cooperation principles

International Climate Finance needs common norms

The commonly agreed goal in the Paris Agreement to limit global warming to 1.5 degrees Celsius is an essential prerequisite for increasing global cooperation through climate finance. Unlike the Kyoto Protocol, its predecessor, the Paris Agreement creates a global reference system that gives the signatory countries a target within which they can formulate and implement appropriate national contributions to counteract global climate change. The Paris Agreement thus relies on soft forms of control and sanctions, such as social and economic pressure on actors who continue contributing to climate change.²⁵ The increasing number of climate neutrality declarations (Figure 4) are an important building block for further entrenching this global norm in society and business.²⁶

This norm is an important common basis and political legitimization for developing and emerging countries to take national steps toward climate neutrality.²⁷

Donor countries should combine support with their own climate action

Reciprocity can be reflected in International Climate Finance by taking into account a mutuality of donor and recipient country contributions when designing and implementing climate policies.²⁸ This means that countries intending to provide financial support to other countries interlink this aid with the design and implementation of their own climate policies.²⁹ Following the principle of reciprocity would also eliminate controversies over unilateral conditionality that arise when donor countries unilaterally demand that recipient countries commit to higher climate change targets and measures. If *both* sides were to commit to higher climate change targets, an international build-up to climate neutrality would arise, embedded in the Paris Agreement's system of global stocktake. This would make it possible to link the political decision-making level for climate change targets

(typically the duty of heads of state and ministers) and the technical implementation level.

Reciprocity is based on the idea that society and policymakers in donor and recipient countries agree that transition efforts and international contributions are appropriate to the circumstances of both countries. The international discussions in the context of the Bali Action Plan have shown how difficult it is to define a method to assess the comparability of measures.³⁰ However, if the goal is not to establish a global comparative assessment as the basis of an agreement, but rather to provide information for national social and political processes, then a variety of elements can work together to create a robust source of information. In this regard, the biennial transparency reports provided for in the Paris Agreement, technical assessment reports, and peer reviews can serve as the basis for such information. Thus, the advantages of multilateral processes in safeguarding the interests of small countries can be combined with the advantages of additional flexibility and accuracy of fit in bilateral processes.

Trust, rules, and transparency as basis for mutual contributions

In the decarbonization process of industry, there are at least two key areas in which the buildup of trust can play a role. First, mutual trust can be achieved through a steady and reliable implementation process of International Climate Finance itself, in which donor and recipient countries are engaged in a continuous exchange. Second, trustful working relationships of political actors can be fostered when no covert political influence is exerted on partner countries. This can provide a basis for preparing and making decisions about international climate change contributions from the industrial sector on both sides, in donor and recipient countries.

The factors of common rules and transparency are closely related.³¹ When establishing new rules, it is particularly helpful to draw upon existing structures that are already familiar to both actors and, for example, to further develop the Enhanced Transparency Framework of the Paris Agreement.

Knowledge exchange strengthens national efforts

Reciprocity of contributions requires a broader awareness and understanding of the need for international cooperation among policymakers and businesses. Efforts for national climate and industrial policy become more effective when this need is not only understood unilaterally, but also understood in other countries and thus leads to measures. In the process, international peer learning makes it easier to implement climate policies, as the industrial sector interviews showed.

²⁵ Dieter Rucht, "Faszinosum Fridays for Future," *Aus Politik und Zeitgeschichte* 47–48 (2019); "Shell: Netherlands court orders oil giant to cut emissions," *BBC*, May 26, 2021 (available online).

²⁶ See, for example, the IEA's Net Zero Report (available online).

²⁷ Simon Sharpe and Timothy M. Lenton, "Upward-scaling tipping cascades to meet climate goals: plausible grounds for hope," *Climate Policy* 21, no. 4 (2021): 421–433.

²⁸ Elinor Ostrom, "Collective action and the evolution of social norms," *Journal of Economic Perspectives* 14, no. 3 (2000): 137–58.

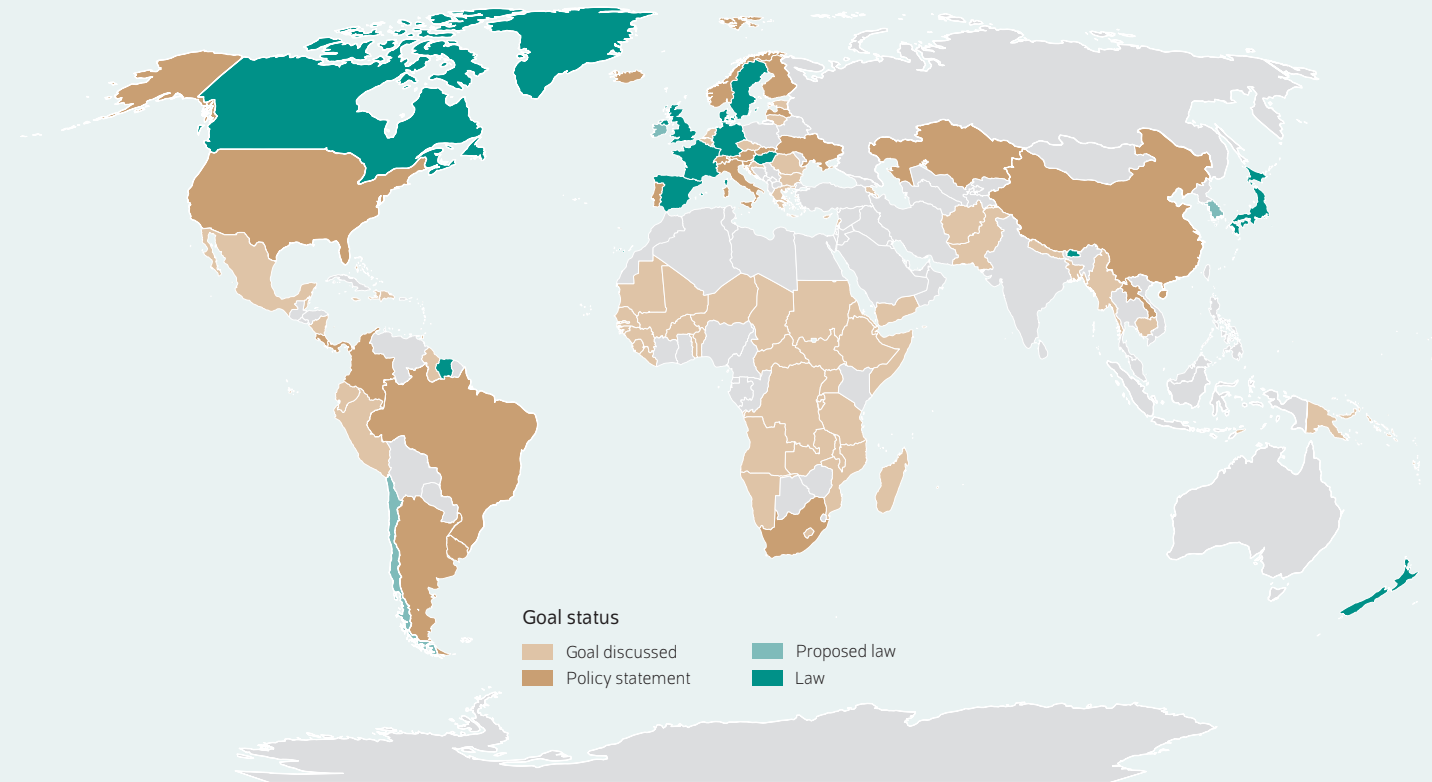
²⁹ Willem Pieter Pauw et al., "Conditional nationally determined contributions in the Paris Agreement: foothold for equity or Achilles heel?" *Climate Policy* 20, no. 4 (2020): 468–484.

³⁰ Mary Jane Mace, "Comparability of efforts' among developed country parties and the post-2012 compliance system," in *Promoting Compliance in an Evolving Climate Regime*, eds. Jutta Brunnée, Meinhard Doelle, and Lavanya Rajamani (Cambridge: 2012): 286–316.

³¹ Romain Weikmans, Harro van Asselt, and J. Timmons Roberts, "Transparency requirements under the Paris Agreement and their (un)likely impact on strengthening the ambition of nationally determined contributions (NDCs)," *Climate Policy* 20, no. 4 (2020): 511–526.

Figure 4

Current state of climate neutrality goals: an international overview



Source: Energy & Climate Intelligence Unit.

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More and more countries are pledging, legally or through various statements of intent, to achieve climate neutrality.

Research identifies such processes of policy diffusion as a more important driver of climate policy in large economies than the joint negotiating and signing of an international treaty or the hosting a UNFCCC conference.³² Such policy diffusion processes could be facilitated by International Climate Finance by supporting or enabling the development of and access to expert networks. Provided that mutual understanding already exists, technical cooperation can also help improve the use of policy diffusion processes and make relevant knowledge available to policymakers and industries.³³

Thus, International Climate Finance in the form of technical support can contribute to cooperation by functioning as a communication and information channel. It can promote the understanding that global cooperation is necessary,

for example through the international exchange of political actors and experts.

As climate finance is typically demand-oriented, this type of communication between donors and recipients is extremely important for both sides to understand what is in demand.

Common reference systems can support the transition process

International Climate Finance can support the international multi-level approach as defined by the Paris Agreement through its characteristic orientation along the needs and circumstances of recipient countries. In this way, international cooperation can support the coordinating role of policy for society, the real economy, and the financial sector in the transition to climate neutrality. At the same time, the respective cooperation partners establish a reference system for evaluating their own mitigation measures and the mitigation measures of partner countries. The respective areas of climate finance cooperation are generally individually designed by donors and recipients, reflecting the country and sector requirements of each. It is important that

32 Sam Fankhauser, Caterina Gennaioli, and Murray Collins, "Do international factors influence the passage of climate change legislation?" *Climate Policy* 16, no. 3 (2015): 318–331; Gabriela Iacobuta et al., "National climate change mitigation legislation, strategy and targets: a global update," *Climate Policy* 18, no. 9 (2018): 1114–1132.

33 For example, through communities of practice such as the Green Growth Knowledge Platform as a potential partner, and/or relevant international policy conferences.

a connection to the emerging international reference system of climate neutrality as well as to the rules of the Paris Agreement exists. In this way, International Climate Finance can contribute to a polycentric system as Ostrom envisioned it: nation states as responsible actors combined with a minimum of higher-level, international governance.

Conclusion: International Climate Finance can improve global cooperation

This analysis shows that International Climate Finance can play an impactful role for improved cooperation in industry if certain design features are modified. These modifications are based primarily on five principles:

First, International Climate Finance should be designed as a part of the common effort to transition to climate neutrality in donor and recipient countries, thus, second, allowing climate contribution reciprocity to be strengthened. To this end, the industrial sector should be integrated more comprehensively into all countries' nationally appropriate climate contributions to contribute to a consistent climate policy framework at the national level.³⁴ Just and inclusive transitions should be considered.³⁵

Third, International Climate Finance ought to serve to build transparency and trust between donor and recipient countries. The design of monitoring, reporting, and reviewing processes has long been a controversial topic in international climate negotiations. However, if these results were no longer to be used as a basis for international financial transfers in the context of emissions trading, but were instead to support shared learning about the effectiveness of climate policies, the acceptance of transparency mechanisms and the

willingness to disclose relevant information promptly and in detail could increase.

For the industrial sector, the most important developments for a successful transition to climate neutrality could thus be reported not only on how the emissions from conventional production processes have developed, but also on how large the share of recycling for different materials is, how the efficiency in material use has developed, and what progress has been made in achieving climate-neutral production processes.

Fourth, countries should strive for common learning, supported by close technical cooperation at a policy, societal, and private sector level. In this way, well-funded decisions about higher climate contributions can be made, which in turn contribute to more effective implementation and thus strengthen reciprocity. The developing countries' access to the technological and regulatory advances of the donor countries must be improved for common learning and technical cooperation to succeed, for example through international expert exchange or joint projects and programs.

Fifth, it is recommended that respective ICF contributions be embedded in joint political agreements on the transition to climate neutrality of the partner countries. Building on a growing understanding of the necessary framework for a transition to climate neutrality, donors should continue orientating themselves according to the needs of the partner countries. To this end, support for the industrial sector must be increased, for example in preparation for the 2021 United Nations Climate Change Conference.

Due to the growing number of declarations of intent on climate neutrality from developing and industrialized countries, there is now a new momentum and thus increased confidence to discuss accelerating the transition to climate neutrality. This should include a discussion of aligning International Climate Finance with the principles of global cooperation on climate change.

³⁴ Zoha Shawoo and Oliver Johnson, *Industry transitions: a critical gap in national climate commitments* (Stockholm Environment Institute: 2019) (available online).

³⁵ David Victor, Frank Geels, and Simon Sharpe, *Accelerating the low carbon transition: the case for stronger, more targeted and coordinated international action* (Energy Transition: 2019) (available online).

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Keywords: collective action, international climate finance, industry climate neutrality