From Governance Experiments to Low-Carbon Transformations:

The Political Institutionalization of Climate Change Mitigation in Emerging Economies

1. State of the Art and Preliminary Work

This project aims to analyze the processes and conditions of political institutionalization of climate change mitigation in the high-carbon intensive sectors of agriculture and energy in emerging economies. We depart from two findings that stand out in the literature: First, we witness the emergence of numerous **governance experiments** that are aimed at reducing *greenhouse gas* (GHG) emissions (e.g. Bulkeley & Castán Broto 2013; Hildén et al. 2017; Hoffmann 2011; Turnheim et al. 2018). These experiments are undertaken by a variety of state and non-state actors as an "*approach to governing*" (Huitema et al. 2018, 144) with the objective of learning and policy adaptation (Fuhr & Lederer 2009; Fuhr et al. 2018; Hickmann 2013, 2017; Hildén et al. 2017; Hoffmann 2011; Huitema et al. 2018). Second, various authors describe the need for ambitious, inter-sectoral and all-encompassing, societal **low-carbon transformations** to maintain the economic and social development within planetary boundaries (Jackson 2011; Lederer et al. 2019 ; Leggewie & Welzer 2010; Scoones et al. 2015; WBGU 2011). From these literatures, we know who does what and why and, to some extent, how successful governance experiments have been. We also have a clear understanding of what is needed to reach low-carbon transformation. However, what we do not know is under which conditions we can close the gap between governance experiments and low-carbon transformations.

In **our own research**, we have focused for a long time on carbon governance arrangements in the Global South (Fuhr & Lederer 2009; Fuhr et al. 2018; Lederer 2014 2015; Lederer et al. 2018; Lederer et al. 2019). In a **previous DFG project** (Reference Numbers: FU 274/11-1 and LE 2644/4-1; Project Number: 270088441) we have analyzed the evolution and impact of two important climate governance experiments – *Reducing Emissions from Deforestation and Forest Degradation* (REDD+) initiated in a top-down fashion, and *Transnational City Networks* resulting from bottom-up activities – in Brazil, India, South Africa, and Indonesia. In particular, we investigated how these initiatives are reconfiguring public authority through recentralization or decentralization (Hickmann et al. 2017; Höhne et al. 2018), and what kind of organizational and policy changes are being triggered in the respective policy fields (Lederer et al. Forthcoming; Lederer & Höhne under review; Stehle et al. 2019). We found that governance experiments were taken up very differently across countries, sectors, and even within countries and sectors, and that there was a high variation in terms of the political institutionalization, particularly at the subnational level (Elsässer et al. 2018; Hickmann et al. 2017; Höhne 2018; Lederer et al. Forthcoming; Stehle et al. 2019). We found that various interesting developments are occurring, regarding both policies and organizations (e.g. the establishment of REDD+ agencies at the national and provincial level in Indonesia and East Kalimantan, the moratorium on new forest concessions in Indonesia, and the launch of the Green India Mission as a domestic substitute for REDD+ in India). While some policy makers initiated highly ambitious projects (e.g. the Corridors of Freedom Project in Johannesburg or the Forest Carbon Partnership Facility Project on REDD+ in East Kalimantan), other initiatives showed very little progress (e.g. C40 engagement in Indian cities, such as Bangalore or New Delhi or Curitiba in Brazil), became stuck or even collapsed once the government changed (e.g. Central Kalimantan on REDD+ or increasing GHG emission trends despite existing climate policies in Sao Paolo).

Hence, we witness a **micro-macro paradox** similar to that of reform processes in international development cooperation (Andrews 2013; Andrews et al. 2017; particularly in state reform, see Campbell & Fuhr 2004; Grindle 2007; Levy 2015; OECD 2018) and we are thus interested in understanding the conditions under

which governments move towards low-carbon transformations. Some authors claim that governance experiments scale up and are being entrenched in political dynamics (Bernstein & Hoffmann 2018) or by the diffusion of new policy instruments (Jordan & Huitema 2014). However, these literatures stay rather vague on the necessary or sufficient conditions for such processes to take place. As we will elaborate further below, we assume that **political institutionalization is the missing link** in overcoming "political aspects of carbon lock-in" (Bernstein & Hoffmann 2018, 194). Interestingly, this coincides with our own findings, namely that single governance experiments rarely resulted in disruptive developments towards transformation. Instead, we found that context mattered crucially, and that we need to look for more fundamental political dynamics to understand (non-)institutionalization of climate change mitigation (Lederer et al. Forthcoming; Lederer & Höhne under review; Stehle et al. 2019).

The institutional change literature **defines institutions** as "a set of rules, formal or informal, that actors generally follow, whether for normative, cognitive, or material reasons, and organizations as durable entities with formally recognized members, whose rules also contribute to the institutions of the political economy" (Hall & Soskice 2001, 9; see also North 1990). **Institutionalization** is thus the process of developing formal and informal rules (including organizations) and changing previous existing formal and informal rules (including organizations) (see Pasquini & Shearing 2014, 287 for a similar perspective). Institutionalization can occur inside the political system (i.e. in terms of polity, politics, and policy) and outside of it in the broader society (i.e. in terms of social and economic structures, processes and content). In the following, we focus only on institutionalization in the political (and administrative) system, as political dynamics are decisive (Bernstein & Hoffmann 2018).

Institutionalization is **different from policy integration** insofar as the latter focuses predominantly on the coordination and collaboration between silo-administrative structures. Some authors assume that better policy integration leads to better performance, even though evidence on this is scarce (Candel & Biesbroek 2016; for an exception see Persson et al. 2016; Tosun & Lang 2017). By contrast, our focus is less on procedural aspects, but rather on the **conditions** that lead to the outcome of institutionalization as the very substance of (non-)change. As we will explain below, we borrow from the literature on structure (i.e. geography, markets, political-administrative set-up, and normative orders), agency (state and non-state leadership), and multi-level politics (i.e. inter-/transnational and domestic politics) (see *Section 2* for further details). We thereby follow the argument recently raised in the literature on policy integration, which has acknowledged that more fundamental political aspects preclude transformational change (Ravikumar et al. 2018).

The **(global) environmental politics literature** so far knows very little about the conditions under which entire policy fields can be transformed, particularly when it comes to climate change mitigation in the respective policy fields (for notable exceptions, see Rüdinger et al. 2018; van der Heijden 2013). Previous research has primarily focused on analyzing the level of domestic climate change ambitions (Burck et al. 2018; Climate Action Tracker 2017; Rüdinger et al. 2018), indicating that progress in formulating rigorous climate policies has always been highly uneven across countries (e.g. Bernauer & Böhmelt 2013; Tobin 2017). This body of literature has neither explained the conditions for success and failure (for a first attempt to evaluate the credibility of ambitions, see Averchenkova & Matikainen 2016) nor the observable differences *within* countries, namely between subnational jurisdictions or across policy fields. Furthermore, scholars dealing with climate governance experiments have neither included issues of timing and sequencing in their research (Rüdinger et al. 2018), nor have policy sciences included "insights into how experiments affect […] policy change" (Huitema et al. 2018, 156). By contrast, research on societal and economic transitions has highlighted that innovations emerge in specific niches, and that economic and technological aspects have to come together to foster change (Geels 2011). But these literatures have left

governance issues and the role of governments largely at the margin (Meadowcroft 2011). Moreover, most explanations for 'radical climate policy change' are based on policy models that essentially reflect the domestic structures and lessons from the US, and are limited in their application to the global North (Carter & Jacobs 2014). Furthermore, most of these case studies do not integrate global governance developments sufficiently (Lederer 2015; Purdon 2015) and only a few focus on particular aspects of climate change institutionalization in the Global South in a comparative manner (Held et al. 2013; Urban & Sumner 2012; Urban 2014). Our project will contribute to filling this gap by providing new insights into the conditions that are necessary and sufficient for political institutionalization to set us on a path towards low-carbon transformations.

Project-Related Publications

Elsässer, J, Hickmann, T, Stehle, F (2018) The Role of Cities in South Africa's Energy Gridlock. *Case Studies in the Environment* 2, 1-7.

Fuhr, H, Hickmann, T, Kern, K (2018) The role of cities in multi-level climate governance: local climate policies and the 1.5 °C target. *Current Opinion in Environmental Sustainability* 30, 1-6.

Hickmann, T, Fuhr, H, Höhne, C, Lederer, M, Stehle, F (2017) Carbon Governance Arrangements and the Nation-State: The Reconfiguration of Public Authority in Developing Countries. *Public Administration and Development* 37 (5), 331-343.

Hickmann, T, Stehle, F (2019) The Embeddedness of Urban Climate Politics: A Case Study of South Africa's Major Cities. *Journal of Environment & Development* 28 (1), 54-77.

Höhne, C (2018) From "Talking the Talk" to "Walking the Walk"?: Multi-Level Global Governance of the Anthropocene in Indonesia. In: Hickmann, T, Partzsch, L, Pattberg, P, Weiland, S (eds) *The Anthropocene Debate and Political Science,* 124-145. Research Series in Global Environmental Governance, Routledge, London.

Höhne, C, Fuhr, H, Hickmann, T, Lederer, M, Stehle, F (2018) REDD+ and the Reconfiguration of Public Authority in the Forest Sector: A Comparative Case Study of Indonesia and Brazil. In: Nuesiri, EO (ed.), *Global Forest Governance and Climate Change: Interrogating Representation, Participation, and Decentralization,* 203-241. Palgrave Studies in Natural Resource Management, Palgrave Macmillan.

Lederer, M (2015) Global Governance and Climate Change. In: Bäckstrand, K, Lövbrand, E (eds) *Research Handbook on Climate Governance,* 3-13. Edward Elgar, Cheltenham.

Lederer, M (2017) Who Gets What, When, and How? *Global Environmental Politics* 17 (3), 134-140.

Stehle, F, Höhne, C, Hickmann, T, Lederer, M (2019) The Effects of Transnational Municipal Networks on Urban Climate Politics in the Global South. In: Van der Heijden, J, Bulkeley, H, Certomà, C (eds) *Urban Climate Politics. Agency and Empowerment,* 210-230. Cambridge University Press, Cambridge.

Turnhout, E, Gupta, A, Weatherley-Singh, J, Vijge, M, de Koning, J, Visseren-Hamakers, I, Herold, M, Lederer, M (2017) Envisioning REDD+ in a post-Paris era: between evolving expectations and current practice. *Wiley Interdisciplinary Reviews: Climate Change* 8 (1).

2. Objectives and Work Program

2.1 Duration of the Project

This project will be implemented over a period of 36 months from October 2019 to September 2022.

2.2. Objectives

The project's **objective** is to explain why the political institutionalization of climate change mitigation advances at different speeds, and why in some instances there has been little progress or even a reversal of former achievements. Our **research question** is: Under what conditions does climate change mitigation become politically institutionalized in the high-carbon intensive sectors of energy and agriculture at the subnational governmental level of democratic emerging economies? This focus is of **theoretical relevance**, as our research project contributes to the literature on domestic political institutionalization (outome/ dependent variable) in the field of global policy-making (for similar approaches, see Bernstein & Hoffmann 2018; Rüdinger et al. 2018) and brings it together with the literature on agency, structural impediments as well as multi-level politics (conditions/ independent variable). It is therefore potentially relevant beyond

the field of global climate politics. **Empirically**, we go beyond the existing literatures on governance experimentation and low-carbon transformations by focusing on the processes through which climate change mitigation becomes gradually institutionalized at a defined governmental level, and within a certain high carbon-intensive sector. **Methodologically**, our research project is innovative as we will use QCA (*qualitative comparative analysis)* that will enable us to investigate sets of necessary and sufficient conditions.

The dependent variable**,** or the **outcome** we are interested in, is the (non-)existence of the political institutionalization of climate change mitigation in two high-carbon intensive sectors at the subnational level: energy and agriculture. More specifically, we are interested in the advancement of solar energy (as part of renewable energy) and forest-related climate smart conservation agriculture (as part of climate smart agriculture) as they present specific sector solutions for moving towards low-carbon societal transformations. We scrutinize subnational polities within four democratic emerging economies (Brazil, India, Indonesia, and South Africa) and focus on the period between 2005 and 2021.

In the **agricultural sector** we focus on the **promotion of forest-related climate smart conservation agriculture**. REDD+ projects and policies are massively influenced by domestic pressure groups in the agricultural sector (Lederer et al. Forthcoming; Solymosi et al. 2013), and they can only succeed within a broader inter-sectoral approach that holistically understands forestry as part of a broader landscape (Lederer 2012; Turnhout et al. 2017). This is now being conceptualized as *climate smart agriculture* (CSA) (Arakelyan et al. 2017; FAO 2018; Harvey et al. 2014; Totin et al. 2018).[1] We will focus on the political institutionalization of forest-related conservation agriculture (Harvey et al. 2014) as one specific form of CSA, as it refers to practices that also relate to the protection of tropical forests, which is critical for most rainforest nations at the agricultural-forest-frontier in the Global South. In the **energy sector**, we investigate the **promotion of solar energy**. This sector has a huge potential in the Global South and will be of crucial importance for low-carbon transformations. Solar energy is very promising and less environmentally harmful than hydropower and bio-fuel (Edenhofer et al. 2012; Gibson et al. 2017; Pimentel 2008). In our previous research project, which also analyzed the role of transnational city networks, we found that transnational efforts to promote renewable energy (RE) were hampered by institutional structures within nation-states, particularly by the overall lack of competences and resources of city governments and vested business interests (Elsässer et al. 2018; Hickmann et al. 2017). Revenue and expenditure authorities often resided exclusively with higher levels of government, such as provinces or states, limiting the range of local climate action. However, some initiatives succeeded and progressively attempted to broaden their scope – and are thus likely to provide interesting evidence for our research.

2.3 Operationalization

We **operationalize the political institutionalization of climate change mitigation** through four different types of changes which relate to the formal and informal rules in respective sectors under investigation: (i) rhetorical and discursive changes, (ii) organizational changes, (iii) policy changes, and (iv) changes in implementation (see *Table 1*).

Political institutionalization does not only represent a process. It is also a specific outcome that can be measured at the end of the investigation period by tracking the changes in rhetoric, organizations, policies and implementation that have occurred since the starting point (Bernstein & Hoffmann 2018 speak of scale up and entrenchment which is certainly close to what we have in mind, but we believe institutionalization is the better term). All four types can be understood along a continuum that ranges at one end from no

[1] CSA aims at "transform[ing] and reorient[ing] agricultural systems [...by] sustainably increasing agricultural productivity and incomes; adapting and building resilience to climate change; and reducing and/or removing greenhouse gas emissions" (FAO 2018).

change to small and major change, and finally to radical change at the other end (Capano 2009; Hall 1993). This draws on the results of our previous research where we analyzed reconfigurations of authority focusing on the build-up of capacities as well as on the initial signs of policy changes for urban climate change issues and forestry (Lederer et al. Forthcoming; Lederer & Höhne under review; Stehle et al. 2019). However, as we are focusing on institutionalization and lock-in effects over time, we include rhetorical change as a very initial phase, and implementation plus roll-out as a highly advanced phase of political institutionalization. Rhetorical changes can be important signals to societal actors for shifting towards low-carbon transformation, e.g. investing in solar energy or moving towards forest-related climate smart conservation agriculture.

Table 1: Operationalization of Political Institutionalization of Climate Change Mitigation in High-Carbon Intensive Sectors

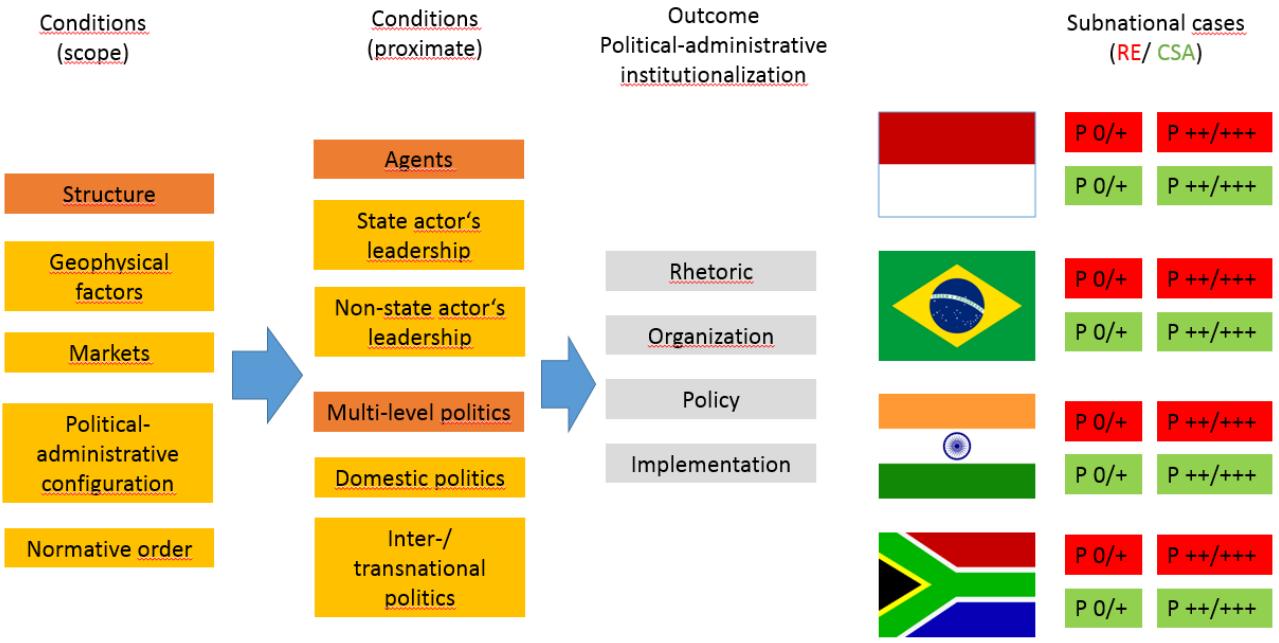
Type of Change	Operationalization	No change (0)	Small Change (0.3)	Major Change (0.7)	Radical Change (1)	Reversal
Rhetoric	Evolvement over time of discourse by actors on climate change mitigation	Rhetorical rejection	Only few actors argue in favor of climate change mitigation	Statements are divided with regard to climate change mitigation	Rhetorical statements are fully aligned with regard to climate change mitigation	Backsliding to former political positions in statements with regard to climate change mitigation
Policy	Set-up of laws, regulations, and development plans	Policy rejection	Change of level of a policy instrument	Change of policy instruments	Change of hierarchy of goals of a policy	Backsliding to former political positions in policies
Organi–zation	Set-up and changes in bureaucracies and capacities within a sector	Organi-zational rejection	Few people work on the issue	Small units set-up	Large department set-up	Backsliding to former organizational structure
Implemen–tation	Implementation orders, resource provision, and enforcement	Implemen tation rejection	Small amount of funding allocated and disbursed; policy change mostly un-enforced	Medium amount of funding allocated and disbursed and policy change mostly enforced	Large amount of funding allocated and disbursed; policy change completely enforced	Backsliding to former political implementation status

Source: Own Compilation based on policy literature (Capano 2009; Hall 1993) and own research (Höhne 2018; Lederer et al. Forthcoming; Lederer & Höhne under review; Stehle et al. 2019).

We will adopt a **two-step approach**. First, we will undertake **a cross-country comparison** analyzing variation at the subnational level in four democratic emerging economies (Brazil, India, Indonesia, and South Africa). In each country, there are subnational jurisdictions with differing degrees of political institutionalization of climate change mitigation in the sectors of energy and agriculture. For each policy field and each country, we analyze two subnational jurisdictions. Altogether, we scrutinize 16 subnational jurisdictions and compare them with each other (see below our criteria for case selection and how we will use QCA methodology). Second, we will undertake **in-depth case studies** focusing on the causal mechanisms within the configurations and solution pathways identified in the first step.

When it comes to the **conditions** that enable or hinder institutionalization, out of the many possible variables we focus on **eight key conditions** within the following three clusters: (i) agency, (ii) structure and (iii) multi-level politics. They are based on two complementary sources: First, on our own research, in which we have found evidence for their relevance (Elsässer et al. 2018; Höhne 2018; Höhne et al. 2018; Lederer et al. Forthcoming; Lederer & Höhne under review; Stehle et al. 2019). Second, on the literatures that have stressed the importance of (i) agency through state and non-state leadership (Finnemore & Sikkink 1998; Keck & Sikkink 1998; Liefferink & Wurzel 2017; Mintrom & Luetjens 2017); (ii) structures through markets, political-administrative configurations, normative orders, and geophysical conditions (Checkel 1999; Risse et al. 2013; Smoke 2015); and (iii) multi-level politics through domestic and international support or

constraints (Hooghe & Marks 2001, 2003; Weibust & Meadowcroft 2014). The latter has also been shown in the literature on the Global South's dual transitions towards democratic market economies (Haggard & Kaufman 1995; Merkel 2010; Nelson 1989) and in the norm literature on human rights (Keck & Sikkink 1998; Risse et al. 1999; Schapper 2017). We argue that these eight conditions are most likely to play a role in specific configurations and thus we do not formulate mutually exclusive hypotheses. In short, our research design is represented in the following graph:



Explanation: RE = renewable energy (solar energy) / CSA = climate smart agriculture (forest-related conservation agriculture); P = Province/subnational state; P 0/+ = Province/subnational state with no or small change; P ++/+++ = Province with major or radical change; progress, stagnation or reversal of institutionalization can occur in any case over the period of investigation.

Structures are often assumed to be very important for policy change. First, geographic conditions matter. They affect the development of solar energy or instruments for forest-related climate smart conservation agriculture. However, we know not only from Germany but, for example, also from the roll-out of wind energy in India, that natural factors cannot explain the differences in performance at the subnational level (Benecke 2009). Second, we consider domestic market development, which determines the prices of available technology and the relative market prices of low carbon solutions (e.g. solar energy, forest-related climate smart conservation agriculture) in comparison to high carbon solutions (e.g. coal energy and conventional agriculture) (Kern et al. 2014). Third, we analyze the existing political-administrative configuration of subnational governments. Subnational governments that lack meaningful powers, financial resources or capacities in a specific sector will not be able to take meaningful action towards institutionalizing climate change mitigation (Stehle et al. 2019). Capacity is a particularly important factor for countries of the Global South, since it tends to be low in subnational administrations (Fuhr 1999, Bersch et al. 2017; Risse et al. 2013). Finally, we scrutinize the normative order of the respective domestic political economy. This includes their shared norms and ideas regarding the way of economic development (Blyth 2002). New normative understandings need to resonate with preexisting domestic normative orders to realize their political institutionalization (Checkel 1999). Domestic legitimacy must be given so that ownership can develop as a prerequisite for any policy change (Krasner & Risse 2014; Lederer 2018).

While our research design acknowledges that these structural elements are of importance, they might not be sufficient for institutionalizing climate change mitigation. We will, therefore, examine these four variables as context conditions, assuming that they have indeed to be present in certain combinations, and up to a certain degree without determining the success of institutionalization (see *Table 2*; if several indicators apply, then we will take the average of the resulting value).

Table 2: Operationalization of Structural Conditions

	Geophysical factors	Markets	Political-administrative configuration	Normative order
Non-exis-tent (0)	*Highly unfavorable:* Very low sunshine duration or small amount of land available for solar parks; No geographic possibilities for CSA due to soil quality (e.g. desert) and lack of land. Very high competition over land for other land uses (e.g. industrialization, agriculture, urbanization).	*Very high production and use prices* of solar energy or CSA products. Solar energy or CSA product prices are well above the average fossil fuel based energy prices or conventional agricultural prices in the country.	*No or very low political, financial, and administrative resources* at the respective governmental and administrative level. No competences for policy-making or implementation. No sources of own income and no allocation of funding from the central government. Very few people working there.	*Existence of strongly conflicting domestic norms* about appropriate behavior with regard to the new external norm. No domestic legitimacy given.
Weak (0.3)	*Unfavorable*: Some duration of sunshine and some land available for solar parks; some opportunities for CSA due to acceptable soil quality (e.g. savanna), weather conditions, and little land available. High competition over land for other pur-poses (e.g. industrialization, agriculture, urbanization).	*High production and use prices* for solar energy or CSA products. Solar energy prices or CSA product prices are above the average fossil fuel-based energy prices or conventional agricultural prices in the country.	*Low political, financial, and administrative resources* at the respective governmental and administrative level. Some competences, mostly for implementation. Administrations are dependent on central government funding and lack own sources of income. Own staff with some knowledge is available.	*Existence of conflicting and opposing norms* about appropriate behavior with regard to the new external norm. Low legitimacy given by elites and by the people.
Medi-um (0.7)	*Favorable*: Medium amount of sunshine duration (e.g. partly savanna/desert) and medium amount of available land. Opportunities for CSA due to good soil quality, weather conditions and available land. Medium competition over land for other purposes.	*Medium production and use prices* of solar energy or CSA products. Solar prices or CSA product prices overall equal the average fossil fuel based energy prices or conventional agricultural prices in the country.	*Sufficient political, financial, and administrative resources* at the respective administrative level. Competences are shared with the central government in the areas of policy-making. Competence for implementation available. Administrations have sources of income and receive central government funding. Medium level of staff available with good knowledge of the topic.	*No conflicting and opposing norms* about appropriate behavior with regard to the new external norm. High legitimacy given by elites and low legitimacy given by the people.
Strong (1)	*Highly favorable:* High sunshine duration (e.g. desert) and large areas of available land for solar parks. Very good possibilities for CSA given due to high soil quality (e.g. accessible rainforest) and available land and very favorable weather conditions. No competition over land for other land purposes.	*Low to very low production and use prices* of solar energy or CSA products. Solar energy prices or CSA product prices are well below the average fossil fuel-based energy prices or conventional agricultural prices in the country.	*Strong political, financial, and administrative resources* at the respective governmental and administrative level. Full competences for policy-making and implementation available. Administrations have own sources of income and do not rely on central government funding. Staff available with very good knowledge of respective topic.	*Existence of supportive domestic norms* with regard to the new external norm. High legitimacy given by the elites and by the people.

Source: Own Compilation.

Change needs **agents** (WBGU 2011) and various authors have highlighted the fact that processes for successful institutionalization depend on key actors that push for policy change (e.g. Finnemore & Sikkink 1998; Keck & Sikkink 1998; Liefferink & Wurzel 2017; Mintrom & Luetjens 2017; Sabatier 1991). On the one hand, we can build on the literature that analyzes the role of political entrepreneurs, which are defined as "advocates for proposals or the prominence of an idea […willing …] to invest their resources – time, energy, reputation, and sometimes money – in the hope of a future return" (Kingdon 1995, 122). In our own research, we have shown that domestic political leadership is especially important in nation-states, which are characterized by a top-down organizational culture (Stehle et al. 2019). But leadership in subnational governments has also been crucial for triggering and maintaining local innovations (e.g. Barber 2013;

Campbell & Fuhr 2004). However, we know little about the conditions under which political leadership boosts more sustainable solutions (Tosun & Schoenefeld 2017). On the other hand, we can build on research that focuses on the role of new normative understandings embodied in (international) norms. Scholars in this tradition have focused on the dynamics between the international and domestic levels, and the adoption of international norms through socialization processes initiated by norm entrepreneurs (Finnemore & Sikkink 1998; Keck & Sikkink 1998; Risse et al. 1999, 2013) or through the localization (Acharya 2004) and norm translation of external norms by domestic actors (Zimmermann 2017). Irrespective of the agents driving the process, however, a change of domestic norms cannot only be contested (Wiener 2018), it can also be rejected by domestic agents who are engaged as antipreneurs (Bloomfield 2015). We will make use of both perspectives and analyze politicians, administrators, representatives of the business sector as well as civil society, the media, and scientists. Non-state actors can be agents in the process of political institutionalization by convincing state actors to take action (Keck & Sikkink 1998), by resisting change (Bloomfield 2015), or by advancing their own political priorities through state capture (Richter 2017). The literature on leadership makes rather strong claims about change agents not only being necessary, but even being sufficient for initiating innovations. Whether this can be generalized, and how significant leadership is for the process of political institutionalization, would need to be scrutinized. We will code the quality of leadership in the following way (see *Table 3*).

Table 3: Operationalization of Agency Conditions

Quality of Leadership	State Actors	Non-State Actors
Non-existent (0)	Political priorities and engagement not in line with the new objectives; public actors take no initiative	Political priorities and engagement not in line with the new objectives; dominant non-state actors take no initiative in favor of the objectives but tend to try to prevent the advancement of these new objectives through lobbying, state capture or outward resistance
Weak (0.3)	Public actors engage in some discourse through speeches, but lack engagement for policy and organizational change and implementation	Dominant non-state actors engage in some discourse, but do not support policy or organizational change and implementation or even try to prevent these through hidden lobbying or state capture
Medium (0.7)	Public actors engage in some discourse, support and initiate policy and organizational change, but do not ensure the implementation	Dominant non-state actors engage in some discourse, and support policy or organizational change, but do not engage in implementation or even try to prevent it through hidden lobbying or state capture
High (1)	Strong political priorities and strong engagement in line with the new objectives; public actors engage in discourse, initiate policy change and organizational change, and ensure implementation	Strong political priorities and strong engagement in line with the new objectives; dominant non-state actors engage in discourse, support policy change and organizational change, and assure the implementation through continued pressure on the government through lobbying or even state capture.

Source: Own Compilation.

Finally, we will incorporate analyses of **multi-level politics**. Initially used by scholars focusing on the European Union as multi-level governance (Hooghe & Marks 2001, 2003), scholars concerned with global environmental politics adopted the term and transferred it to the policy domain of climate change (Lederer 2015). It is now being used to open up the black box of the nation-state and to conceptualize the various processes that link international institutions, national governments, and sub- and non-state actors in global climate policy-making (Fuhr et al. 2018; Gupta 2007; Höhne 2018; Weibust & Meadowcroft 2014). Recent research has distinguished multi-level politics from multi-level governance and defined the former as "variants of regularly recurring or more sporadic processes of interaction between and among territorially defined governmental and, sometimes, non-governmental actors" (Alcantara et al. 2016, 38). Accordingly, this can involve interactions, including support or constraints, by domestic or international actors. This is of relevance for two reasons: First, the policies in question are being developed within a global setting and receive much support from international donors, NGOs, etc. We therefore scrutinize whether this second-image reversed mechanism involving international as well as transnational channels plays a role for the

domestic institutionalization of policies. Second, and particularly important for the cases we focus on, multi-level politics occur in federalist and decentralized countries through interaction between the national and subnational governments (Hickmann et al. 2017). These governmental levels comprise varying degrees of political, administrative, and financial powers in a respective policy field (Smoke 2015) and public actors can engage in uploading or downloading new policy initiatives or innovations to other governmental levels for policy formulation and implementation (Höhne et al. 2018). We therefore distinguish between two conditions: inter-/transnational multi-level politics and domestic multi-level politics (see *Table 4*).

Table 4: Operationalization of Domestic and Inter-/Transnational Multi-Level Politics Conditions

	Domestic multi-level politics	**Inter-/transnational multi-level politics**
Non-existent (0)	*No flow of information or orders* from upper or lower governmental level to the governmental level under scrutiny; institutionalization occurs without mutual coordination and cooperation with other governmental level actors or are non-existent. No allocation of financial resources from upper or lower governmental levels to the respective governmental level under scrutiny.	*No flow of information or financial resources* from international/ transnational organization to the respective level of government under scrutiny.
Weak (0.3)	*Sporadic flow of information and/or orders* from upper or lower governmental level to the governmental level under scrutiny; institutionalization occurs with weak mutual coordination and/or weak cooperation with other governmental level actors. No allocation of financial resources from upper or lower governmental levels to the respective governmental level under scrutiny.	*Sporadic flow of information* from international/ transnational organization to the respective level of government under scrutiny, e.g. in one-off events or initiatives.
Medium (0.7)	*Regular flow of information and/or orders* from upper or lower governmental level to the governmental level under scrutiny; institutionalization occurs with mutual coordination and/or cooperation with other governmental level actors. Sporadic allocation of financial resources from upper or lower governmental levels to the respective governmental level under scrutiny.	*Regular flow of information* from international/ transnational organization to the respective level of government under scrutiny, e.g. in regular meetings or working groups. *Sporadic flows of resources* from international/ transnational organization to the respective level of government under scrutiny.
Strong (1)	*Regular flow of information and/or orders* from upper or lower governmental level to the governmental level under scrutiny; institutionalization occurs with mutual coordination and/or cooperation with other governmental level actors. Regular allocation of financial resources from upper or lower governmental levels to the respective governmental level under scrutiny.	*Regular flow of information and financial resources* from international/ transnational organization to the respective level of government under scrutiny.

Source: Own Compilation.

While none of these **eight conditions** alone can adequately explain why climate change mitigation gets politically institutionalized at subnational level in democratic emerging economies, we are particularly interested in their combined effects. We hence use the method of qualitative comparative analysis (QCA) which is particularly useful for at least three reasons: (i) it captures the complexity of political institutionalization and related dynamics by using non-binary values to code the relevant conditions; (ii) it is well-suited for medium-N research; and (iii) it helps to identify the necessary and sufficient conditions for policy outcomes across a certain set of cases.

2.4 Work Program

In the following, we explain our case selection, our decision to use a combination of QCA analysis as well as case studies, and how we will generate and interpret our data. We will close this section by presenting our work plan. Our universe of **cases** theoretically includes all subnational units where climate change mitigation has been institutionalized at least to some extent. We will focus on **comparable subnational units** in four democratic, decentralized, and high GHG emitting emerging economies[2]: Brazil, India,

[2] Among all countries of the world and including land-use GHG emissions, India was the third largest historical GHG emitter, Indonesia the fourth, Brazil the sixth, and South Africa the fourteenths in 2014 (World Resources Institute 2018).

Indonesia, and South Africa. We do this for the following four reasons: First, these countries have all started to become actively engaged by issuing climate change action plans. Second, in all four countries there is significant variation among subnational entities (see *Tables 6* and *7*), i.e. within the same national setting and the same sector, and there are strong differences in performing climate activities that can only be explained by taking subnational features into account. As we will study a total of 16 subnational cases over the period from 2005 to 2021, we will be able to pinpoint phases of progress, stagnation and reversal by focusing on the three time points of 2005, 2013, and 2021, which increases our sample from 16 to 48 units.[3] In this context, we will undertake inter-sectoral and intra-sectoral comparisons to highlight differences and congruencies (for each sector, we have 24 units which will be sufficient for QCA as the number of units is higher than the combination of conditions as we first scrutinize the significance for structural conditions with 2^4=16, and then the salience of conditions of agency and multi-level politics conditions with 2^4=16). Third, we explicitly focus on democratic and largely decentralized countries. This allows us to better explain the role of subnational politics that is, at least to some extent, independent of the nation-state's capital. Finally, and very importantly for QCA (Berg-Schlosser & De Meur 2009), we have first-hand knowledge from our previous research and can build on our existing analyses.

Regarding **solar energy** across all four countries, subnational governments have at least some jurisdictional authority to promote solar energy. In India, energy is a concurrent subject of central and state governments, in which states can develop their own policies and are responsible for their implementation (Thapar et al. 2016). In Brazil, energy provision is a Federal subject, but states can come up with their own auctions and strategies. In Indonesia and South Africa, central governments are the owners of the utilities, have the mandate for energy generation and maintain the national grid. This leaves subnational governments with less authority than in Brazil or India. However, Indonesian provinces have their own Energy Agencies, can choose to build their own grid provisioned with their own (solar) energy and have the "power to develop regional master plans and regulations on energy" (IEA 2007). In South Africa, cities have the mandate for energy distribution, while energy generation is considered a grey area with municipalities being partly dependent on the central government's approval (Jaglin 2014). Obviously, there is significant variation in terms of the political institutionalization of solar energy in our four countries and this is partially strong at subnational level (*Table 6* shows cases identified so far and their degree of institutionalization).

Table 6: Subnational Competences and Cases of Solar Energy[4]

	Brazil	India	Indonesia	South Africa
Solar energy competences	Energy policy is Union subject, but states can have own energy generation auctions	Energy policy is concurrent subject of central and state governments	Energy is driven by national policies. Provinces are mostly involved in some implementation, but can build up their own grid and energy provision	Energy policy is centralized, but municipalities, especially metropolitan areas, can provide their own energy to some extent
Radical or major changes	Minas Gerais (0.7)	Gujarat (1)[5]	East Java (0.7)	Cape Town (0.7)
Small or no changes	Bahia (0.3)	Mizoram (0.3)	West Java (0.3)	KwaDukuza (0.3)

Source: Own Compilation.

[3] In the past, political science literature, such as norm research, has often focused only on successful cases (but see McKeown 2009 for norm regress). By including "laggards" in our analysis, we hope to better identify constellations that actually make change possible and learn about conditions that hinder or even reverse institutionalization. Furthermore, the use of non-cases has to this point been neglected in the analysis of climate policies. We can, however, build on insights from studies of revolution (Skocpol 1979) or genocide studies (Straus 2015), where examining the non-cases has been successfully used.

[4] We present our cases in country tables to underline the subnational variation, which we would like to understand through cross-country analysis. Following the QCA logic we could also present all cases according to their varying institutionalization degrees, irrespective of the country they are based in.

[5] The identified cases and degrees of institutionalization are preliminary findings based on previous results from our field work and based on an additional desk study research which will be reevaluated and, if necessary, adjusted during the first country trip.

Across all four countries, subnational governments have at least some jurisdictional authority to promote **forest-related climate smart conservation agriculture.** However, the responsibilities of subnational governments in the agricultural sector vary significantly across the cases: In Indonesia, responsibility lies with the districts, which give out plantation permits and may propose land use changes, while the central and provincial government can give overall policy direction in forms of strategies, plans and policies (Setiawan et al. 2016). As we are mostly interested in policy change and have witnessed interesting initiatives at the provincial level in East Kalimantan, we will study provinces instead of districts, even though the latter will ultimately be needed for implementation. In India, agriculture is a state subject, but is also influenced by national policies, such as the Agroforestry Policy (Pandey & Suganthi 2015). In South Africa (Republic of South Africa 1996, 135) and Brazil (The Federative Republic of Brazil 1988Article 23, VII, VIII; Article 24, VI), the agricultural sector is concurrently managed by national and provincial or state governments. As *Table 7* (with cases identified so far) shows, there is significant variation at the subnational level.

Table 7 Subnational Competences and Cases of Forest-Related Climate Smart Conservation Agriculture

	Brazil	India	Indonesia	South Africa
Forest-related climate smart conservation agriculture competences	Concurrent subject between central and state governments	State subject with national and state policies and state implementation	National, provincial and district policies and district implementation	Concurrent subject between central and provincial governments
Radical or major changes	Mato Grosso (0.7)	Himachal Pradesh (0.7)	East Kalimantan (0.7)	Eastern Cape (0.7)
Small or no changes	Rondônia (0)	Mizoram (0.3)	*Central Kalimantan* (from 0.7 back to 0)	North West (0)

Source: Own Compilation. Reversal in *italic*.

We are aware that our subnational cases are not exactly alike as they differ regarding governmental level, size, economic strength and powers. Yet, they are **similar** in the sense that they all have a minimum of jurisdictional authority to actually initiate and institutionalize change.

We will use QCA as a Y-centered **methodology** for the following five reasons (for overviews of QCA, see Beach 2018; Emmenegger et al. 2013; Ragin 1987, 2000; Ragin 2004; Schneider & Wagemann 2007; Siewert 2017; Wagemann 2015) (for recent applications of QCA in different policy fields, see Brockhaus et al. 2017; Mello 2017; Pahl-Wostl & Knieper 2014; Tobin 2017): First, focusing on at least two subnational entities per country in the two sectors on three occasions respectively, we will have 48 units – a number that can no longer be analyzed with traditional methods of case study research. The span of at least eight years from 2005 to 2013 and from 2013 to 2021 permits us to regard these units as snapshots rather independent from each other (as also indicated by Siewert 2017, 295f). Cases in which both progressive change and reversal occurred, either from 2005 to 2013 or from 2013 to 2021, will additionally be analyzed in a second step by in-depth single case studies to scrutinize the causal mechanisms of identified solution pathways. Second, existing data for the subnational level is rather sketchy and cannot be compared with statistical tools that focus on individual hypotheses. Third, we expect conjunctural causality as political institutionalization is hardly ever caused by one factor. Fourth, QCA can be helpful for our project as our independent variables (conditions) can most likely be differentiated in 'necessary' or 'sufficient', and the possibility of separating the analyses of context and proximate conditions seems appropriate for our case. Furthermore, we might observe functional equivalents of necessary conditions (e.g. resources for institutionalization being provided either domestically or by external donors). Finally, we hypothesize that different paths can lead to political institutionalization (equifinality).

We will differentiate the outcomes and conditions in more nuanced ways rather than being dichotomous 0/1, and will therefore apply fuzzy set QCA (fsQCA) with the following specifications:

- To be able to attribute values in fuzzy set analyses, one needs a very good knowledge of these cases and the coding of values must follow the theoretical attributes of the concept (in our case institutionalization, structure, agency, multi-level politics). The attribution follows a mix of deductive and inductive elements. We have so far identified the conditions that we consider important and operationalized them in a preliminary manner (see *Tables 1* to *5*; values are 0, 0.3, 0.7, 1) and we will refine them during our field work, describing each category in a verbal way (Ragin 2000, 156; Schneider & Wagemann 2007, 177).
- In order to avoid the problem that we might not have enough cases for the number of possible configurations, we will split our analyses, first analysing the structural conditions as context factors (2^4=16 combinations) and then focus on agency and multi-level politics as proximate conditions (2^4=16 combinations) to identify possible causal pathways (Schneider & Wagemann 2007, 260f) for intra-sectoral institutionalization (i.e. for 24 units) and inter-sectoral institutionalization (i.e. for 48 units).
- QCA analysis will not be the only method used in our research project, as we will also include classical comparative case study research and process tracing (Collier 2011; George & Bennett 2005) in an effort to identify specific causal mechanisms after the configurations of solution pathways have been established (Emmenegger et al. 2013, 189; Rohlfing & Schneider 2013; Schneider & Wagemann 2007, 268). This will include deviant cases without a configuration to account for a given outcome, as well as typical cases where process tracing might allow us to identify the causal mechanisms in place.
- We are very aware of the critiques vis-à-vis QCA methodologies (for a good summary, see Siewert 2017, 293; Tobin 2017, 32) but having a rather large number of cases and insufficient quantitative data, fsQCA seems to be the right choice for us.

We will use the following methods for **data generation:** First of all, we will resort to an extensive literature review of scholarly and grey literature. Furthermore, we will carry out a qualitative content analysis of official documents, such as budget plans, ministerial notes, policy briefings, and media articles (the latter for identifying rhetorical change) (Mayring 2000). We will also conduct semi-structured expert interviews with state and non-state actors in the respective four countries (Bogner et al. 2009). Due to a lack of data on most conditions, semi-structured expert interviews will be an important source of information. Therefore, plenty of time is budgeted for interviews in all four countries and we will make sure that we formulate the questions in a fsQSA logic (Siewert 2017, 287). However, a triangulation approach (Rothbauer 2008) is particularly important for our empirical research, since we are aware that our research design relies heavily on the scores we give to our conditions, and any measurement errors would distort our empirical results (Blatter & Haverland 2012).

Responsibilities

The principal investigators have extensive experience in conducting field research. They will train the research associates prior to their field trip and accompany them during their first fieldwork. Markus Lederer (PI) will coordinate the research on forest-related climate smart conservation agriculture and Harald Fuhr (PI) will be responsible for the work on solar energy. Research Associate 1 will be a post-doc with in-depth knowledge on QCA and we do not expect this of a doctoral student. He/she will be based at the TU Darmstadt, and will be responsible for coordinating the methodological aspects of the project and carrying out the case studies in India and Indonesia. Research Associate 2 will carry out the case studies in Brazil and South Africa. He/she will be based at the University of Potsdam.

Work Schedule

The project will start with a six-month preparatory phase from October 2019 to March 2020. We will first undertake a desk study to review discursive, policy and organizational changes of solar energy and forest-related climate smart conservation agriculture initiatives, as well as their implementation in our target countries. During this phase, we will work closely with our partners (e.g. GIZ, CIFOR, CPR, IIT Mandi). During

the second half of the first project year and the first nine months of the second project year (April 2020 to June 2021) field research will be carried out in two consecutive phases, an approach which has been proven successful in previous projects. In the first phase, one PI (for two weeks) and one research associate (for four weeks) will visit the countries, make use of established contacts, identify new interview partners and key informants, and select relevant subnational institutionalization processes, which are not entirely identifiable by desk research. After completing a brief comparative evaluation, the research associates will return to their respective target countries until the end of June 2021. A comparative analysis of our data will be completed by December 2021, and we will present our key findings at a side event of a climate change summit in 2021. The last nine months will be allocated to work on additional publications and presenting the findings at organized conferences (e.g. ISA 2022). We also plan to invite a number of country and sector specialists to present our research results at the closing workshop at the University of Potsdam in September 2022.

2.5. Data Handling

Project metric data sets will be made accessible along with all other publications.

2.6. Other Information (does not apply)

2.7. Experiments (does not apply)

2.8. Information on Scientific and Financial Involvement of International Cooperation Partners

Over the past few years, we have established a number of contacts that will prove very helpful for our research. In the past, we worked closely together with GIZ's Sector Program "Internationale Waldpolitik" (IWP) on REDD+ (contact person: Reinhard Wolf; reinhard.wolf@giz.de), collaborating in a joint workshop at GIZ's representative office in Berlin in October 2018. We have also organized two summer schools for GIZ staff on these issues. In addition, CLIMATE FOCUS (Charlotte Streck, c.streck@climatefocus.com), a well connected advisory company, will help us to identify local partners. Regarding energy governance, we can rely on our contacts at the DIW (Karsten Neuhoff, kneuhoff@diw.de). We also have very good contacts with various universities and research institutions in the respective countries, such as the Fundação Getulio Vargas (FGV) (Feliciano de Sá Guimarães, feliciano.guimaraes@fgv.br); the University of Brasília (Matias Franchini, matifranchi@yahoo.com.ar); the University of Cape Town (Ralph Hermann, ralph.hamann@gsb.uct.ac.za; Frank Matose, frank.matose@uct.ac.za); the University of Witwatersrand (Coleen Vogel, Coleen.Vogel@wits.ac.za); Center for International Forestry Research in Bogor (Christopher Martius: C.Martius@cgiar.org); World Agroforestry Centre (ICRAF) in Bogor (Sonya Dewi: S.Dewi@cgiar.org); the Bogor Agricultural University (Dodik Nurrochmat: dnurrochmat@gmail.com); the Centre for Policy Research in New-Delhi (Navroz Dubash: ndubash@gmail.com); and the Indian Institute of Technology, Mandi (Shyamasree Dasgupta: shyamasree@iitmandi.ac.in). All these institutions have offered us expert assistance in helping us to identify relevant interview partners.

3. References

Fuhr, H (1999) Institutional Change and New Incentive Structures for Development: Can Decentralization and Better Local Governance Help? In: Welttrends (7, 25) Winter 1999; p. 21-51.

Acharya, A (2004) How Ideas Spread: Whose Norms Matter? Norm Localization and Institutional Change in Asian Regionalism. *International Organization* 58 (2), 239-275.

Alcantara, C, Broschek, J, Nelles, J (2016) Rethinking Multilevel Governance as an Instance of Multilevel Politics: A Conceptual Strategy. *Territory, Politics, Governance* 4 (1), 33-51.

Andrews, M (2013) *The Limits of Institutional Reform in Development: Changing Rules for Realistic Solutions.* Cambridge University Press, Cambridge/UK.

Andrews, M, Pritchett, L, Woolcock, M (2017) *Building State Capability: Evidence, Analysis, Action*. Oxford University Press, Oxford/UK, 277.
Arakelyan, I, Moran, D, Wreford, A (2017) Climate smart agriculture: a critical review. In: Nunan, F (ed.), *Making Climate Compatible Development Happen,* 66-86. Routledge, London.
Averchenkova, A, Matikainen, S (2016) Assessing the consistency of national mitigation actions in the G20 with the Paris Agreement, Grantham Research Institute on Climate Change and the Environment, London.
Barber, BR (2013) *If Mayors Ruled the World. Dysfunctional Nations. Rising Cities*. Yale University Press, New Haven, MA.
Beach, D (2018) Achieving Methodological Alignment When Combining QCA and Process tracing in Practice. 47 (1), 64-99.
Benecke, G (2009) Varieties of Carbon Governance: Taking Stock of the Local Carbon Market in India. *Journal of Environment and Development* 18 (4), 346-370.
Berg-Schlosser, D, De Meur, G (2009) Comparative Research Design: Case and Variable Section. In: Rihoux, B, Ragin, CC (eds) *Configurational Comparative Methods. Qualitative Comparative Analysis (QCA) and Related Techniques,* 19-32. Applied Social Research Methods Series, Sage, Los Angeles, United States.
Bernauer, T, Böhmelt, T (2013) National climate policies in international comparison: The Climate Change Cooperation Index. *Environmental Science & Policy* 25, 196-206.
Bernstein, S, Hoffmann, M (2018) The politics of decarbonization and the catalytic impact of subnational climate experiments. *Policy Sciences* 51 (2), 189-211.
Bersch, K, Praça, S, Taylor, MM (2017) State Capacity, Bureaucratic Politicization, and Corruption in the Brazilian State. *Governance* 30 (1), 105-124.
Blatter, J, Haverland, M (2012) *Designing Case Studies. Explanatory Approaches in Small-N Research*. Palgrave, Houndsmill, United Kingdom.
Bloomfield, A (2015) Norm antipreneurs and theorising resistance to normative change. *Review of International Studies* 42 (2), 310-333.
Blyth, M (2002) *Great Transformations - Economic Ideas and Institutional Change in the Twentieth Century*. Cambridge University Press, Cambridge.
Bogner, A, Littig, B, Menz, W. (eds.) (2009) *Interviewing Experts.* Palgrave Macmillan, London.
Brockhaus, M, Korhonen-Kurki, K, Sehring, J et al. (2017) REDD+, transformational change and the promise of performance-based payments: a qualitative comparative analysis. *Climate Policy* 17 (6), 708-730.
Bulkeley, H, Castán Broto, V (2013) Government by experiment? Global cities and the governing of climate change. *Transactions of the Institute of British Geographers* 38 (3), 361-375.
Burck, J, Marten, F, Bals, C, Höhne, N (2018) The Climate Change Performance Index. Results 2018, Germanwatch, Bonn.
Campbell, T, Fuhr, H. (eds.) (2004) *Leadership and Innovation in Subnational Government: Case Studies from Latin America.* The World Bank, Washington D.C., USA.
Candel, JJL, Biesbroek, R (2016) Toward a processual understanding of policy integration. *Policy Sciences* 49 (3), 211-231.
Capano, G (2009) Understanding Policy Change as an Epistemological and Theoretical Problem. *Journal of Comparative Policy Analysis: Research and Practice* 11 (1), 7-31.
Carter, N, Jacobs, M (2014) Explaining Radical Policy Change: The Case of Climate Change and Energy Policy under the British Labour Government 2006–10. *Public Administration* 92 (1), 125-141.
Checkel, JT (1999) Norms, Institutions, and National Identity in Contemporary Europe. *International Studies Quarterly* 43 (1), 84-114.
Climate Action Tracker (2018) 'Coutries', https://climateactiontracker.org/countries/, accessed 05.11.
Collier, D (2011) Understanding Process Tracing. *PS: Political Science & Politics* 44 (04), 823-830.
Edenhofer, O, Madruga, RP, Sokona, Y. (eds.) (2012) *Renewable Energy Sources and Climate Change Mitigation. Special Report of the Intergovernmental Panel on Climate Change.* Cambridge University Press, Cambridge.
Elsässer, J, Hickmann, T, Stehle, F (2018) The Role of Cities in South Africa's Energy Gridlock. *Case Studies in the Environment* 2, 1-7.
Emmenegger, P, Kvist, J, Skaaning, S-E (2013) Making the Most of Configurational Comparative Analysis: An Assessment of QCA Applications in Comparative Welfare-State Research. *Political Research Quarterly* 66 (1), 185-190.
FAO (2018) 'Climate-Smart Agriculture', http://www.fao.org/climate-smart-agriculture/en/, accessed 6 August.
Finnemore, M, Sikkink, K (1998) International Norm Dynamics and Political Change. *International Organization* 52 (4), 887-917.
Fuhr, H, Lederer, M (2009) Varieties of Carbon Governance in Newly Industrializing Countries. *The Journal of Environment & Development* 18 (4), 327-345.
Fuhr, H, Hickmann, T, Kern, K (2018) The role of cities in multi-level climate governance: local climate policies and the 1.5 °C target. 30, 1-6.
Geels, FW (2011) The multi-level perspective on sustainability transitions: Responses to seven criticisms. *Environmental Innovation and Societal Transitions* 1 (1), 24-40.
George, AL, Bennett, A (2005) *Case Studies and Theory Development in the Social Sciences*. BCSIA Studies in International Security, MIT Press, Cambridge M.A., USA/ London, UK, 331.
Gibson, L, Wilman, EN, Laurance, WF (2017) How Green is 'Green' Energy? *Trends in Ecology & Evolution* 32 (12), 922-935.
Grindle, MS (2007) Good Enough Governance Revisited. *Development Policy Review* 25 (5), 533-574.
Gupta, J (2007) The Multi-Level Governance Challenge of Climate Change. *Environmental Sciences* 4 (3), 131-137.
Haggard, S, Kaufman, RR (1995) *The Political Economy of Democratic Transitions*. Princeton University Press, Princeton/US.
Hall, PA (1993) Policy Paradigms, Social Learning, and the State: The Case of Economic Policymaking in Britain. *Comparative Politics* 25 (3), 275-296.
Hall, PA, Soskice, D (2001) An Introduction to Varieties of Capitalism. In: Hall, PA, Soskice, D (eds) *Varieties of Capitalism. The Institutional Foundations of Comparative Advantage,* 1-70. Oxford University Press, Oxford, UK.

Harvey, CA, Chacón, M, Donatti, CI et al. (2014) Climate-Smart Landscapes: Opportunities and Challenges for Integrating Adaptation and Mitigation in Tropical Agriculture. *Conservation Letters* 7 (2), 77-90.
Held, D, Roger, C, Nag, E-M. (eds.) (2013) *Climate Governance in the Developing World.* Polity, Cambridge.
Hickmann, T (2013) Private Authority in Global Climate Governance: The Case of the Clean Development Mechanism. *Climate and Development* 5 (1), 46-54.
--- (2017) Voluntary Global Business Initiatives and the International Climate Negotiations: A Case Study of the Greenhouse Gas Protocol. *Journal of Cleaner Production* 169, 94-104.
Hickmann, T, Fuhr, H, Höhne, C, Lederer, M, Stehle, F (2017) Carbon Governance Arrangements and the Nation-State: The Reconfiguration of Public Authority in Developing Countries. *Public Administration and Development* 37 (5), 331-343.
Hildén, M, Jordan, A, Huitema, D (2017) The Search for Climate Change and Sustainability Solutions: The Promise and the Pitfalls of Experimentation. *Journal of Cleaner Production* 169, 1-7.
Hoffmann, M (2011) *Climate Governance at the Crossroads: Experimenting With a Global Response After Kyoto*. Oxford University Press, Oxford.
Höhne, C (2018) From "Talking the Talk" to "Walking the Walk"?: Multi-Level Global Governance of the Anthropocene in Indonesia. In: Hickmann, T, Partzsch, L, Pattberg, P, Weiland, S (eds) *The Anthropocene Debate and Political Science,* 124-145. Research Series in Global Environmental Governance, Routledge, London.
Höhne, C, Fuhr, H, Hickmann, T, Lederer, M, Stehle, F (2018) REDD+ and the Reconfiguration of Public Authority in the Forest Sector: A Comparative Case Study of Indonesia and Brazil. In: Nuesiri, EO (ed.), *Global Forest Governance and Climate Change: Interrogating Representation, Participation, and Decentralization,* 203-241. Palgrave Studies in Natural Resource Management, Palgrave Macmillan.
Hooghe, L, Marks, G (2001) *Multi-Level Governance and European Integration*. Governance in Europe, Rowman & Littlefield Publishers, Lanham, xvi, 251 p.
--- (2003) Unraveling the Central State, but How? Types of Multi-Level Governance. *The American Political Science Review* 97 (2), 233-243.
Huitema, D, Jordan, A, Munaretto, S, Hildén, M (2018) Policy experimentation: core concepts, political dynamics, governance and impacts. *Policy Sciences* 51 (2), 143-159.
IEA, IEA 'Energy Law No. 30/2007', https://www.iea.org/policiesandmeasures/pams/indonesia/name-140104-en.php, accessed.
Jackson, T (2011) Societal Transformations for a Sustainable Economy. *Natural Resources Forum* 35, 155-164.
Jaglin, S (2014) Urban Energy Policies and the Governance of Multilevel Issues in Cape Town. *Urban Studies* 51 (7), 1394-1414.
Jordan, A, Huitema, D (2014) Innovations in climate policy: conclusions and new directions. *Environmental Politics* 23 (5), 906-925.
Keck, ME, Sikkink, K (1998) *Activists Beyond Borders: Advocacy Networks in International Politics*. Cornell University Press, Ithaca.
Kern, F, Smith, A, Shaw, C, Raven, R, Verhees, B (2014) From laggard to leader: Explaining offshore wind developments in the UK. *Energy Policy* 69, 635-646.
Kingdon, JW (1995) *Agendas, Alternatives, and Public Policies*. HarperCollins College Publishers, New York, USA.
Krasner, SD, Risse, T (2014) External Actors, State-Building, and Service Provision in Areas of Limited Statehood: Introduction. *Governance* 27 (4), 545-567.
Lederer, M (2012) REDD+ governance. *Wiley Interdisciplinary Reviews: Climate Change* 3 (1), 107-113.
--- (2014) The Politics of Carbon Markets in the Global South. In: Stephan, B, Lane, R (eds) *The Politics of Carbon Markets*, Routledge, Cheltenham.
--- (2015) Global Governance and Climate Change. In: Bäckstrand, K, Lövbrand, E (eds) *Research Handbook on Climate Governance,* 3-13. Edward Elgar, Cheltenham.
--- (2018) External State Actors. In: Börz, TA, Risse, T, Draude, A (eds) *The Oxford Handbook of Governance in Areas of Limited Statehood,* 191-210. Oxford University Press, Oxford.
Lederer, M, Höhne, C (under review) Max Weber in the Tropics: The Bureaucratization of Forestry through REDD+. 26.
Lederer, M, Wallbott, L, Bauer, S (2018) Tracing sustainability transformations – drivers of Green Economy approaches in the Global South. *Journal of Environment and Development* 27 (1), 3-25.
Lederer, M, Wallbott, L, Urban, F (2019) Green Transformations and State Bureaucracy. In: Fouquet, R (ed.), *Handbook on Green Growth*, Edward Elgar, Cheltenham.
Lederer, M, Höhne, C, Stehle, F (Forthcoming) External REDD+ Advocates and Nation-States in the Global South. 37.
Leggewie, C, Welzer, H (2010) Another "Great Transformation"? Social and Cultural Consequences of Climate Change. *Journal of Renewable Sustainable Energy* 2 (031009), 1-13.
Levy, B (2015) Governance Reform: Getting the Fit Right. *Public Administration and Development* 35 (4), 238-249.
Liefferink, D, Wurzel, RKW (2017) Environmental leaders and pioneers: agents of change? *Journal of European Public Policy* 24 (7), 951-968.
Mayring, P (2000) *Qualitative Inhaltsanalyse*. Beltz, Weinheim.
McKeown, R (2009) Norm Regress: US Revisionism and the Slow Death of the Torture Norm. *International Relations* 23 (1), 5-25.
Meadowcroft, J (2011) Engaging with the politics of sustainability transitions. *Environmental Innovation and Societal Transitions* 1 (1), 70-75.
Mello, P (2017) Qualitative Comparative Analysis and the Study of Non-State Actors. In: Schneiker, A, Kruck, A (eds) *Researching Non-State Actors in International Security: Theory & Practice,* 123-142. Routledge, London.
Merkel, W (2010) *Systemtransformation. Eine Einführung in die Theorie und Empirie der Transformationsforschung*. 2nd Edition edn., VS Verlag für Sozialwissenschaften, Wiesbaden/Germany.
Mintrom, M, Luetjens, J (2017) Policy entrepreneurs and problem framing: The case of climate change. *Environment and Planning C: Politics and Space* 35 (8), 1362-1377.
Nelson, JM. ed.) (1989) *Fragile Coalitions: The Politics of Economic Adjustment.* Overseas Development Council, Washington D.C./US.

North, DC (1990) *Institutions, Institutional Change and Economic Performance.* eds Alt, J, North, DC. The Political Economy of Institutions and Decisions, Cambridge University Press, Cambridge, UK.
OECD (2018) *Perspectives on Global Development 2019: Rethinking Development Strategies*. Perspectives on Global Development, OECD Publishing, Paris/France, 236.
Pahl-Wostl, C, Knieper, C (2014) The capacity of water governance to deal with the climate change adaptation challenge: Using fuzzy set Qualitative Comparative Analysis to distinguish between polycentric, fragmented and centralized regimes. *Global Environmental Change* 29, 139-154.
Pandey, VL, Suganthi, D (2015) Fueling agricultural growth in India: Some reflections. *Land Use Policy* 42, 227-232.
Pasquini, L, Shearing, C (2014) Municipalities, Politics, and Climate Change: An Example of the Process of Institutionalizing an Environmental Agenda Within Local Government. *The Journal of Environment & Development*.
Persson, Å, Eckerberg, K, Nilsson, M (2016) Institutionalization or wither away? Twenty-five years of environmental policy integration under shifting governance models in Sweden. *Environment and Planning C: Government and Policy* 34 (3), 478-495.
Pimentel, D (2008) *Biofuels, Solar and Wind as Renewable Energy Systems - Benefits and Risks*. Springer Netherlands.
Purdon, M (2015) Advancing Comparative Climate Change Politics: Theory and Method. *Global Environmental Politics* 15 (3), 1-26.
Ragin, CC (1987) *The Comparative Method. Moving Beyond Qualitative and Quantitative Strategies*. University of California Press, Berkeley, CA.
--- (2000) *Fuzzy-Set Social Science.*, University of Chicago Press, Chicago, IL.
--- (2004) Turning the Tables: How Case-Oriented Research Challenges Variable-Oriented Research. In: Brady, HE, Collier, D (eds) *Rethinking Social Inquiry: Diverse Tools, Shared Standards,* 123-138. Rowman & Littlefield, Lanham.
Ravikumar, A, Larson, AM, Myers, R, Trench, T (2018) Inter-sectoral and multilevel coordination alone do not reduce deforestation and advance environmental justice: Why bold contestation works when collaboration fails. *Environment and Planning C: Politics and Space* 36 (8), 1437-1457.
Republic of South Africa (1996) Constitution of the Republic of South Africa In: Africa, GoS (ed.), Pretoria.
Richter, S (2017) Der Wolf im Schafspelz. Illegitime Herrschaft durch State Capture in Nachkriegs- und Transitionsgesellschaften. *ZeFKo Zeitschrift für Friedens- und Konfliktforschung* 6 (2), 174-206.
Risse, T, Ropp, SC, Sikkink, K (1999) *The Power of Human Rights. International Norms and Domestic Change.* Cambridge University Press, Cambridge, UK.
--- (2013) *The Persistent Power of Human Rights. From Commitment to Compliance*. Cambridge University Press, Cambridge, UK.
Rohlfing, I, Schneider, CQ (2013) Improving Research On Necessary Conditions: Formalized Case Selection for Process Tracing after QCA. *Political Research Quarterly* 66 (1), 220-235.
Rothbauer, P (2008) Triangulation. In: Given, LM (ed.), *The SAGE Encyclopedia of Qualitative Research Methods,* 892-894. Sage, Los Angeles.
Rüdinger, A, Voss-Stemping, J, Sartor, O, Duwe, M, Averchenkova, A (2018) Towards Paris-compatible climate governance frameworks. An overview of findings from recent research into 2050 climate laws and strategies, IDDRI, Paris.
Sabatier, PA (1991) Toward Better Theories of the Policy Process. *PS: Political Science and Politics* 24 (2), 147-156.
Schapper, A (2017) Children's Rights Implementation as a Multi-Level Governance Process. *Human Rights Quarterly* 39 (1), 104-129.
Schneider, CQ, Wagemann, C (2007) *Qualitative Comparative Analysis (QCA) und Fuzzy Sets. Ein Lehrbuch für Anwender und jene, die es werden wollen*. Barbara Budrich, Opladen.
Scoones, I, Newell, P, Leach, M. (eds.) (2015) *The Politics of Green Transformations. Pathways to Sustainability.* Routledge, Abingdon.
Setiawan, EN, Maryudi, A, Purwanto, RH, Lele, G (2016) Opposing interests in the legalization of non-procedural forest conversion to oil palm in Central Kalimantan, Indonesia. *Land Use Policy* 58, 472-481.
Siewert, MB (2017) Qualitative Comparative Analysis. In: Jäckle, S (ed.), *Neue Trends in den Sozialwissenschaften,* 273-305. Springer, Wiesbaden.
Skocpol, T (1979) *States and Social Revolutions: A Comparative Analysis of France, Russia, and China*. Cambridge University Press, Cambridge.
Smoke, P (2015) Rethinking Decentralization: Assessing Challenges to a Popular Public Sector Reform. *Public Administration and Development* 35 (2), 97-112.
Solymosi, K, Carodenuto, S, Tennigkeit, T (2013) Agriculture and REDD+ - The main driver of deforestation and a key sector for successful implementation of REDD+, GIZ Bonn and Eschborn.
Stehle, F, Höhne, C, Hickmann, T, Lederer, M (2019) The Effects of Transnational Municipal Networks on Urban Climate Politics in the Global South. In: Van der Heijden, J, Bulkeley, H, Certomà, C (eds) *Urban Climate Politics. Agency and Empowerment,* 210-230. Cambridge University Press, Cambridge.
Straus, S (2015) *Making and Unmaking of Nations: War, Leadership, and Genocide in Modern Africa*. Cornell University Press, Ithaca, NY.
Thapar, S, Sharma, S, Verma, A (2016) Economic and environmental effectiveness of renewable energy policy instruments: Best practices from India. *Renewable and Sustainable Energy Reviews* 66, 487-498.
The Federative Republic of Brazil (1988) Constitution of the Federative Republic of Brazil In: Brazil, Go (ed.), Brasília.
Tobin, P (2017) Leaders and Laggards: Climate Policy Ambition in Developed States. *Global Environmental Politics* 17 (4), 28-47.
Tosun, J, Lang, A (2017) Policy integration: mapping the different concepts. *Policy Studies* 38 (6), 553-570.
Tosun, J, Schoenefeld, JJ (2017) Collective Climate Action and Networked Climate Governance. *Wiley Interdisciplinary Reviews: Climate Change* 8 (1).
Totin, E, Segnon, A, Schut, M et al. (2018) Institutional Perspectives of Climate-Smart Agriculture: A Systematic Literature Review. 10 (6), 1990.
Turnheim, B, Kivimaa, P, Berkhout, F (2018) *Innovating Climate Governance: Moving Beyond Experiments*. Cambridge University Press, Cambridge.

Turnhout, E, Gupta, A, Weatherley-Singh, J et al. (2017) Envisioning REDD+ in a post-Paris era: between evolving expectations and current practice. *Wiley Interdisciplinary Reviews: Climate Change* 8 (1), e425-n/a.
Urban, F (2014) *Low Carbon Transitions for Developing Countries*. Routledge, Oxon.
Urban, F, Sumner, A (2012) Pro-Poor Low Carbon Development. In: Ockwell, D, Mallet, A (eds) *Low Carbon Technology Transfer: From Rhetoric to Reality*, Earthscan (forthcoming), London.
van der Heijden, J (2013) Different but equally plausible narratives of policy transformation: A plea for theoretical pluralism. *International Political Science Review* 34 (1), 57-73.
Wagemann, C (2015) Qualitative comparative analysis. In: Wenzelburger, G, Zohlnhöfer, R (eds) *Handbuch Policy-Forschung,* 429-452. Springer, Wiesbaden.
WBGU (2011) World in Transition. A Social Contract for Sustainability. Summary for Policy-makers, German Advisory Council on Global Change (WBGU), Berlin.
Weibust, I, Meadowcroft, J. (eds.) (2014) *Multilevel Environmental Governance: Managing Water and Climate Change in Europe and North America.* Edward Elgar, Cheltenham.
Wiener, A (2018) *Contestation and Constitution of Norms in Global International Relations*. Cambridge University Press, Cambridge, UK, 267.
World Resources Institute (2018) 'CAIT Climate Data Explorer. Historical Emissions', http://cait.wri.org/historical/, accessed 29th January 2018.
Zimmermann, L (2017) *Global Norms with a Local Face: Rule-of-Law Promotion and Norm Translation*. Cambridge Studies in International Relations, Cambridge University Press, Cambridge.

4 Requested Modules/Funds

4.1 Basic Module – Guidance on Cost Breakdown

	10-12/2019		2020		2021		1-9/2022	
Staff costs	**Quan-tity**	**Total €**	**Quan-tity**	**Total €**	**Quan-tity**	**Total €**	**Quan-tity**	**Total €**
WiMi E13 100%	1	18,000	1	72.000	1	72,000	1	54,000
WiMi E13 66%	1	16,575	1	66.300	1	66.300	1	49,725
SHK	2	3,207.75	2	12,831	2	12,831	2	9,623,25
Total staff costs	**Σ**	**37,782.75**	**Σ**	**151,131**	**Σ**	**151,131**	**Σ**	**113,348.25**
Other costs	**Total**		**Total**		**Total**		**Total**	
Equipment		-		-		-		
Consumables		-		-		-		
Travel		€4,148		€51,490		€32,241		€9,376
Workshop								10,000
Other[6]				400				
Total other costs		**€4,148**		**€51,890**		**€32,241**		**€19,376**
Total annual costs		**€41,930.75**		**€203,021**		**€183,372**		**€132,724.25**
TOTAL COSTS								**€561,048**

4.1.1 Staff Costs

Research Associate 1 (Wissenschaftliche/r Mitarbeiter/in E13, 100%) will conduct the case studies on solar energy and forest-related climate smart conservation agriculture in India and Indonesia. He/ she will be based at the TU Darmstadt and coordinate the methodological aspects of the project for which in-depth knowledge on QCA is required. Research Associate 2 (Wissenschaftliche/r Mitarbeiter/in E13, 66 %) will pursue the case studies on solar energy and forest-related climate smart conservation agriculture in Brazil and South Africa. He/she is expected to have an educational background in international relations, political science or development studies. Due to the large amounts of fieldwork in combination with applying for a rather sophisticated methodology, we aim to hire one postdoc and one doctoral researcher. The post-doc will have specific methodological responsibilities as mentioned above. In addition, two student research assistants (10h/week à 11,75 €) will support the project.[7]

[6] This includes costs for vaccination e.g. malaria, encephalitis etc.
[7] Staff cost calculations according to DFG website: http://www.dfg.de/formulare/60_12/60_12_de.pdf and according to TU Darmstadt SHK costs (p. 5-6): https://www.intern.tu-darmstadt.de/media/dez_vii/infosaz/Leitfaden_fuer_studentische_Hilfskraefte.pdf.

4.1.2 Direct Project Costs

Project costs are limited to travel and participation fees. Necessary quipment will be provided by our respective institutions.

4.1.2.1 Travel Expenses

In 2019 and 2021, the entire research team will attend the Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC). The purpose of these trips is two-fold. First, we will hold a side event at the conference in 2021. Second, we will use the opportunity to conduct initial interviews with relevant partners attending the conference in 2019, a practice we have successfully carried out before. The travel expenses in 2020 and 2021 will mostly cover field trips to the respective countries where, in each case, one principal investigator together with one research associate will carry out the first field trip. The principal investigator will stay for two weeks, while the research associate will conduct interviews over a period of four weeks (28 days). The second trip will be organized for a duration of eight weeks (56 days) and will be made by one research associate. As he/she will travel from province to province, he/she will not be able to rent an apartment, but will stay in hotels. We have calculated daily allowances and accommodation allowances accordingly. The research associates will attend one ECPR method school on QCA in Bamberg in 2020. We aim to present our results at the DVPW Conference in 2020, at the Earth System Governance (ESG) Conferences in 2021, and at the Annual Convention of the International Studies Association (ISA) in 2022. Furthermore, the project team will meet twice per year, either in Potsdam or Darmstadt, which will include the closing conference.

Destination	**Airfares (return flights)**	**Daily allowances**	**Accommodation**	**National travel/ EU travel**	**Partici-pation fee**	**Total costs**
COP-25 – TBA (Africa or Latin America)	2 people x €1000 = €2000	2x7 days x €30 = €420	2x7x€60 = €840	-	-	€3,260
Workshop Potsdam	-	2x3 days x €28 = €168	2*3*€70 = €420	2x €150 = €300	-	€888
Total costs 2019						**€4,148**
Indonesia (first trip)	2x€1000 = €2,000	1 person x28 days x€31 + 1 person x14 days x€31= €1,302	1x28x€60 + 1x14*€60= €2,520	€1000		€6,822
South Africa[8] (first trip)	2x€1,100 = €2,200	1 person x28 days x€24 + 1 person x14 days x€24= €1,008	1x28x€60 + 1x14*€60= €2,520	€1000		€6,728
India[9] (first trip)	2x€900= €1,800	1 person x28 days x€41 + 1 person x14 days x€41= €1,722	1x28x€60 + 1x14*€60= €2,520	€1,000		€7,042
Brazil[10] (first trip)	2x€1,000 = €2,000	1 person x28 days x€44 + 1 person x14 days x€44= €1,848	1x28x€60 + 1x14*€60= €2,520	€1,000		€7,368
Research in Indonesia	1x€1000	1 person x56 days x€31 = €1,736	1x56x€60 = €3,360	€1,500		€7,596
Research in South Africa	1x€1,100	1 person x56 days x€24 = €1,344	1x56x€60 = €3,360	€1,500		€7,304
ECPR Winter School	-	2x7x€28 = €392	2x7x€70 = €980	2*€150 = €300	2*€895 = €1,790	€3,462
DVPW conference	-	4x6x€28 = €672	4x6x€70 = €1,680	4*€150 = €600	2*€100 + 2x€120 = €440	€3,392
Workshop Darmstadt	-	2x3x28 = €168	2*3*€70 = €420	2x €150 = €300	-	€888
Workshop Potsdam	-	2x3x28 = €168	2*3*€70 = €420	2x €150 = €300	-	€888
Total costs 2020						**€51,490**

[8] We used Johannesburg as a point of reference for the calculation of daily allowances and accommodation costs.
[9] We used New Delhi as a point of reference for the calculation of daily allowances and accommodation costs.
[10] We used Sao Paulo as a point of reference for the calculation of daily allowances and accommodation costs.

Research in Brazil	1x€1,000	1 person x56 days x€44 = €2,464	1x56x€60 = €3,360	€1,500		€8,324
Research in India	1x€900	1 person x56 days x€41 = €2,296	1x56x€60 = €3,360	€1,500		€8,056
ESG conference	4*€800 = €3,200	4x7x€50 = €1,400	4x7x€70 = €1,960	-	1x€280 + 3x€375= €1,405	€7,965
COP 27 – venue TBA (Asia)	4 people x €900 = €3600	4x7 days x €30 = €840	4x7x€60 = €1,680	-	-	€6,120
Workshop Darmstadt	-	2x3x28 = €168	2*3*€70 = €420	2x €150 = €300	-	€888
Workshop Potsdam	-	2x3x28 = €168	2*3*€70 = €420	2x €150 = €300	-	€888
Total costs 2021						**€32,241**
ISA Annual Convention – Nashville	4x€900 = €3,600	4x7x€40 = €1,120	4x7x€70 = €1,960	-	1x€80 +3x€280 = €920	€7,600
Workshop Darmstadt	-	2x3x28 = €168	2*3*€70 = €420	2x €150 = €300	-	€888
Concluding conference Potsdam	-	2x3x28 = €168	2*3*€70 = €420	2x €150 = €300	-	€888
Total costs 2022						**€9,376**
TRAVEL COSTS						**€97,255**

4.2 *Module Workshop Funding*

We plan to invite a number of country, renewable energy and climate smart agriculture specialists to present our findings at the University of Potsdam in September 2022. We would require €5,000 to meet travel and accommodation costs for this two-day workshop that will also be used as a dissemination platform for our results. Since most experts will be traveling from our case study countries, the majority of funds will be allocated to cover travel costs.

4.3 *Division of Grant*

The grant will be divided equally between the two research partners.

	Type	TU Darmstadt	University of Potsdam
2019	Staff Costs	€19,603.88	€18,178.88
	Travel Expenses	€2,518	€1,630
	Total 2019	**Σ €22,121.88**	**Σ €19,808.88**
2020	Staff Costs	€78,415.50	€72,715.50
	Travel Expenses	€25,775	€25,715
	Vaccination	€200	€200
	Total 2020	**Σ €104,390.50**	**Σ €98,630.50**
2021	Staff Costs	€78,415.50	€72,715.50
	Travel Expenses	€15.986,50	€16,254.50
	Total 2021	**Σ €94,402**	**Σ €88,970**
2022	Staff Costs	€58,811.62	€54,536.62
	Travel Expenses	€4,688	€4,688
	Results Workshop		€10,000
	Total 2022	**Σ €63,499.62**	**Σ €69,224.62**
(DIVIDED) PROJECT COSTS		**€284,414**	**€276,634**

5 Project Requirements

5.1 *Employment Status Information*

Lederer, Markus, Professor of International Relations at the TU Darmstadt (W3); Fuhr, Harald, Professor of International Politics at the University of Potsdam (W3)[11]

5.2 *First Time Proposal Data (does not apply)*

5.3 *Composition of the Project Group*

Martina Dingeldein (TU Darmstadt) and N.N. (University of Potsdam) will be responsible for coordinating and managing the financial aspects of the project.

5.4 *Cooperation With Other Researchers*

5.4.1 Researchers who will work together with us on this project (see also 2.7)

Dr. Steffen Bauer (German Institute on Development, Germany), Prof. Dr. Detlef Sprinz (PIK Potsdam), Dr. Alonso Villalobos (Universidad de Costa Rica), and Dr. Thomas Hickmann (Utrecht University).

5.4.2 Researchers who have worked together with us over the past three years

Markus Lederer: Prof. Dr. Frank Biermann (Utrecht University); Prof. Dr. Philipp Pattberg (VU Amsterdam); Dr. Frauke Urban and Dr. Ethemcan Turhan (both KTH Stockholm), Dr. Steffen Bauer (German Institute on Development), Dr. Robert Falkner (LSE), Prof. Anh Dang Nguyen (VASS Vietnam), Dr. Shyamasree Dasgupta (IIT Mandi), Prof. Dr. Navroz Dubash (CPR), Dr. Christopher Martius (CIFOR), Dr. Thomas Hickmann (now Utrecht University), and Prof. Dr. Alonso Villalobos (UCR).

Harald Fuhr: Prof. Dr. Jürgen Kropp, Prof. Detlef Sprinz, PhD (PIK), Prof. Dr. Kristine Kern (Leibniz Institute for Regional Development/ University of Potsdam), Prof. Dr. Charlotte Streck (Climate Focus), Prof. Dr. Patricia Nanz and Dr. Kathrin Stephen (both Institute for Advanced Sustainability Studies, Potsdam), and Dr. Thomas Hickmann (now Utrecht University).

[11] Harald Fuhr will be co-leading the research project even after his end of tenure in May 2020. A supporting letter by the University of Potsdam can be found attached, indicating the enduring support of the university for his ongoing duties as co-project leader.