Abstract
The paper examines the prospects of a normative approach to institutional design for systematically introducing the concept of legitimacy to the debate on how to internationally regulate research on and possible applications of geoengineering with solar radiation management (SRM). Given the high desirability of international regulation of SRM resulting from its strong transboundary and regionally differentiated effects, legitimacy needs to be considered one of the core concerns of any potential international SRM governance scheme. The aim of this paper is to clarify the role of the concept of legitimacy in international SRM governance, and to set forth a specific approach aimed at identifying legitimacy-enhancing institutional design features for internationally regulating research on and possible applications of SRM. Since international regulation never proceeds in a void but is deeply embedded in interest and power based international politics, a central motif of this paper is to identify the constraining and enabling conditions for legitimate international SRM governance to emerge.

1. Introduction: Geoengineering and the need for legitimate international regulation

Large-scale technological measures to counteract climate change, referred to interchangeably as geoengineering or climate engineering, have recently been increasingly gaining attention in scholarly research and public debate. Defined as “intentional, large-scale manipulation of the environment” (Keith 2000; 2010), these technologies have the potential to offset global climate change by reducing either the concentration of greenhouse gases in the atmosphere or the amount of sunlight that reaches the earth. In this paper, I focus on approaches in the latter category, which are commonly referred to as solar radiation management (SRM). I examine the need for devising legitimate international governance mechanisms aimed at regulating research on and applications of SRM and present a possible approach to identifying such regulatory mechanisms. The overall aim is to clarify the role of the concept of legitimacy in international SRM governance, to set forth a specific approach for identifying institutional design features that increase legitimacy in the context of SRM governance, and to examine the constraining and enabling effects of interest and power relations in this context.
I proceed as follows: in the remainder of this introduction, I discuss the need for international regulation of SRM and the importance of systematically considering questions of legitimacy in this context. Three dimensions of legitimacy are introduced: input, throughput, and output legitimacy. In the second section, I relate these dimensions of legitimacy to a specific normative approach to institutional design, which I call normative institutional design theory. In the third section of this paper, I proceed to examine questions arising from the regulation of SRM in relation to specific institutional design features. The focus here is on what prospects exist for an application of normative institutional design theory in this regard, given the constraining and enabling effects of interest and power politics that apply to SRM governance. In the conclusion, I discuss the strengths and weaknesses of normative institutional design theory in relation to the international governance of SRM.

International regulation of SRM is desirable because altering the global climate has strong transboundary effects. Given the regionally differentiated effects of an SRM intervention, there is likely to be significant disagreement between states on the desirability of SRM as well as on how to apply SRM (e.g. to what degree and for how long). In order to avoid international tensions and conflict and to ensure good governance, a legitimate international governance scheme is needed. The importance of international regulation, as opposed to a bottom-up process of norm-creation (as proposed by David Victor [2008]), stems from the immediacy with which regulation is needed. It needs to be in place before any individual state begins with field-testing. It is important to note in this context that the desirability of a legitimate governance scheme for SRM in no way implies that legitimate regulation will actually emerge. Whether international regulation emerges in a given issue area is the result of a complex set of factors. Whether legitimate regulation emerges again poses a new set of questions. These will be addressed in section 3.

While legitimacy has often been referred to as being an essential aspect of any potential governance scheme directed at regulating SRM (Carlin 2007; Victor et al 2009), conceptual clarity has so far been lacking in the discussion, and no one piece of writing has attempted to systematically introduce the concept into the debate. The remainder of this section thus focuses on the concept of legitimacy, and attempts to achieve its systematic introduction to the debate on SRM governance.

At the most basic level, a social or political order can be described as legitimate when its subjects consider its rules to be appropriate and binding. That is they accept the authoritative allocation of values occurring within it, which may be costly for them, even in the absence of sanctioning mechanisms. I will here avoid a broad discussion of the philosophical roots of different conceptions of legitimacy and instead introduce three dimensions of legitimacy in
reference to which different conceptions of legitimate governance can be discussed: input, throughput, and output legitimacy.

*Input legitimacy* refers to the notion that those being ruled should have something to say in the policy-making process. In a representative democracy, input is secured through the right to vote and assures the accountability of decision-makers to those whom they represent. Different societal interests are thus represented by those who were elected to do so. In a direct democracy, input is not mediated through representation but instead occurs through the direct participation of those governed. In settings beyond the nation-state it is very difficult to secure input legitimacy. Technically, decision-makers at the international level are accountable to those who elected them as their representatives in the context of national elections. However, the national discourse in the run-up to national elections tends to focus on national issues. There is thus a lack of information on the international issues policy-makers will have to deal with when in office. Additionally, two other problems arise in the context of input-legitimacy at the international level. Firstly, the absence of strong transnational interest representation leads to decision-making that is not informed by the interests of those affected. Secondly, and most significantly in regard to global issues such as consciously altering the climate, those affected by a decision are often not represented in the decision-making process. The latter can be referred to as lack of input-congruency (Zürn 1998: 237), since the group of people who are represented in the decision-making process is not congruent with the group of people who are affected by political outcomes.

*Throughput legitimacy* refers to the quality of the process by which rules are determined. To ensure throughput legitimacy, it is important that it is clear who is responsible for which decisions. Transparency is thus a central feature of a legitimate decision-making process. From a democratic theory perspective, a legitimate decision-making process also cannot simply rely on majority voting, but must involve deliberative processes in which individual interests are subjected to public scrutiny (Zürn 1998: 240). Thus, in order to secure throughput legitimacy, it is essential that at the international level decisions are not simply made through diplomatic bargaining, but via a process of deliberative argumentation in which individual interests are scrutinized and debated in regard to their justifiability.

*Output legitimacy* refers to the substantial quality of rules themselves. This is an important aspect of the concept of legitimacy since even a system which follows a legitimate process in its decision-making but produces unacceptable outcomes must be considered illegitimate. Its subjects will not voluntarily comply with its rules. Similarly as with input legitimacy, a deficiency in output legitimacy occurs when there is no congruency between the reach of a rule and the extent of the relevant social context to which it applies (Zürn 1998: 238). The denationalization of social contexts, i.e. the increase in externalities that operate across borders (transboundary effects), has led to a lack of output-congruency in the nation-state;
this reminds us that international institutions are an (albeit imperfect) response to a deficit in legitimacy, and not its origin. In terms of output-congruency with regard to transnational issues, international institutions are an improvement to the territorially-bound reach of decisions made in nation-states. Nonetheless, it must be noted that most international institutions from the viewpoint of output-congruency are still insufficient, while at the same time overstepping the boundaries of legitimate decision-making with regard to input-congruency. Shortly put, international institutions do not do enough in terms of output, but what they do is already too much to be justified in terms of input.

The following section substantiates this discussion of legitimacy by examining a specific normative approach to institutional design in the light of the different dimensions of legitimacy presented above.

2. Legitimacy and normative institutional design

Scholarly work on institutional design has largely been conducted from a functionalist point of view, assuming that actors, understood as strategically acting utility-maximizers, consciously design institutions in a way that furthers their interests and helps them in avoiding collectively undesired outcomes (Koremenos et al 2001). When acting within an institutional setting, an actors’ behavior is assumed to be determined through the rational pursuit of fixed interests, which in turn are determined by structural factors exogenous to the individual. This approach has been criticized for being ahistorical (Wendt 2001), but proves useful for examining questions such as whether regime formation in a given case can be considered likely or not and how an institution in a given issue area is likely to be designed. Nonetheless, this approach does not include an examination of the legitimacy of an institution.

Most recently, there has emerged a novel approach to institutional design which focuses explicitly on normative questions (Ulbert et al 2004; Risse and Kleine 2010). I will refer to this approach as normative institutional design theory. This approach takes serious the criticism directed against the functionalist approach to institutional design. Instead of understanding interests as externally determined and fixed over time, normative institutional design theory assumes that actors constantly formulate and reformulate their interests via processes of deliberation. It is thus based on a logic of communicative action (Risse 2000), while traditional institutional design theory is based on the rationalist logic of strategic action.

The logic of communicative action in political science has been developed in reference to the political philosophy of philosopher Jürgen Habermas. In his two-volume opus on the topic, Habermas develops the concept of communicative action to explain and analyze rational cooperative behavior distinct from the conventional understanding of rationality as utility-maximization. Habermas does understand communicative action as being goal-
oriented, but not in the same way as is strategic action - while strategic action is geared towards the enforcement of one’s fixed preferences with language serving only as a means towards this end (language understood as a conveyor of information), communicative action is aimed at arriving at a reasoned consensus between actors. In this understanding language is not restricted to the exchange of information concerning actor’s preferences, but also functions as an origin of social integration and consensus-seeking behavior (Habermas 1992b, 96). Examining cooperative behavior from this point of view thus brings into focus the possibility of understanding cooperation as an outcome resulting from preference change via deliberation – an understanding not possible when approaching cooperation from a rational choice approach, since in this perspective preferences are assumed to be fixed. It is thus possible for a reasoned consensus to emerge from arguing, with actors yielding to the better argument and changing their own preferences accordingly, whereas bargaining based on fixed preferences can only result in compromise.

However, in empirical research it is not possible to retrospectively determine whether an actor has been engaged in deliberative consensus-seeking behavior or in strategic bargaining – in a real-world setting, the two become indistinguishable. This is because the intrinsic motivation underlying an actors’ behavior cannot be observed. Actors engaging in bargaining still constantly justify their demands in terms of generally accepted norms and consensual knowledge, and actors engaging in arguing routinely use reasons to further their interests. Thus, the strict analytical separation of arguing and bargaining as mutually exclusive rationalities of social action does not lend itself to empirical analysis, since it leaves a question of most basic importance unanswered: How do we know arguing when we see it?

Since actors engaged in bargaining will use rhetoric indistinguishable from arguing, for the observer it becomes obvious that “arguing [is] all-pervasive during all phases of international negotiations” (Ulbert et al 2004: 2). What does this mean for research on arguing? In order to move the debate forward from ideal-type theoretical reflection towards the formulation of concepts amenable to empirical research, the focus has shifted from an understanding of arguing and bargaining as mutually exclusive rationalities of social action to an understanding that interprets arguing and bargaining as modes of interaction and communication. Actors are no longer assumed to engage exclusively in one or the other, but are rather seen as moving along a continuum on which arguing and bargaining occupy opposing ends.

Apart from the different possible outcomes of arguing and bargaining (preference change v. compromise), Ulbert et al (2004) identify differences in the modal, procedural and structural characteristics of each. While the modal characteristics of arguing consist of claims about the validity of empirical and normative assertions based on argumentative power, bargaining centers on claims to the credibility of pragmatic demands based on bargaining power (e.g.
the credibility of threats). Whereas the procedures of arguing are characterized as reflexive in the sense of scrutinizing truth-claims in an exchange of arguments with the common frame of reference changing accordingly, bargaining is characterized as sequential in the sense of exchanging information on demands, threats, promises and the like. Finally, the structure of arguing is understood as being of a triadic nature, while the structure of bargaining is characterized as being dyadic. This refers to the acceptance of an external authority by the speakers to which actors engaging in arguing refer in order to make their validity claims, a condition not met by actors engaged in bargaining, since for them only mutual assessment counts (Ulbert et al 2004: 5f, see also Elster 1989, Saretzki 1996).

Abandoning the dichotomous view of arguing and bargaining as rationalities of social action allowed for a change in the associated research program. Instead of asking whether arguing is present as a rationality of social action in international negotiations, the question became under which conditions arguing can lead to a changes in actors’ preferences. Consequently, research has recently begun to focus on institutional design principles which promote arguing as a mode of interaction and communication in an institutional setting, thus furthering the possibility of arriving at a reasoned consensus in international negotiations. In fact, in “Faktizität und Geltung” (1992a; “Facts and Norms”), Habermas himself explicitly refers to the necessity of specific institutional scope conditions by applying his model of deliberative democracy, sometimes also referred to as deliberative or discursive institutionalism (a term coined by Vivian Schmitt [2002, 2008, 2010]), to the procedures of the constitutional state which perform this function in the realm of the nation state (Deitelhoff 2006: 120). The focus of research today thus is on persuasion processes and persuasive outcomes and not on the conceptual differences between truth-seeking and rhetorical action (Risse and Kleine 2010). Habermasian theory itself, when examined in a broader context including Habermas’ legal and democratic theory, implies that successful consensus-seeking behavior and persuasion in politics demand an institutional framework, and that this institutional framework should be the focus of research. An institutional framework supporting arguing processes is an important precondition for arguing to take place in the normatively integrated nation state, and even more so in the fragmented sphere of international politics (Deitelhoff 2006: 282).

How does this discussion relate to the questions of legitimacy discussed in the previous section? Normative institutional design theory examines the processes occurring within an institutional setting, seeking to understand which institutional design features further the occurrence of arguing over bargaining. Its focus thus lies on throughput legitimacy, assuming that a process of deliberation will lead to outcomes superior to those that result from diplomatic bargaining. At the same time, input legitimacy is not neglected, as will be
explained below. Membership is considered an important institutional design feature, and for a process to be legitimate the input of those affected by it is considered essential.

But which institutional design features can further the occurrence of arguing in international negotiations? The basis for research on the design of deliberative international institutions is found in Habermas' theory of communicative action. Habermas identifies the properties of an ideal speech situation in which arguing can unfold freely and lead to persuasion and preference change as well as the importance of a shared life-world as a prerequisite for a meaningful exchange of arguments. In an ideal speech situation, there are no restrictions concerning participation in the discourse – this ensures input legitimacy. Everyone is allowed to question any assertion, to introduce any assertion into the discourse, and to express their attitudes, desires and needs. No speaker may be prevented from exercising these rights (Habermas 1990: 86). The term "shared life-world" (gemeinsame Lebenswelt) refers to the "intuitive, unproblematic and irreducible holistic background" (Habermas 1985: 348, my translation) which the participants in a discourse must share in order for them to be able to argue successfully about the validity of their respective claims.

Habermas' theory has often been criticized for being too demanding in the conditions it presupposes for arguing to be successful. But as in the debate on arguing v. bargaining, the characteristics of an ideal speech situation and a shared life-world must be understood as ideal types from which reality deviates to differing degrees in just about any case. Understood in this sense, research on negotiations needs to focus on which mechanisms can possibly contribute to the approximation of an ideal speech situation and to the creation and strengthening of a shared life-world, in order to identify conditions under which arguing can be assumed to be successful. In empirical research, several such institutional features and supporting conditions have been identified as being conducive to arguing. I will here not discuss the empirical studies themselves, but simply introduce their results.

In order for arguing to occur, it is important that the issue area under consideration already be highly institutionalized (Ulbert et al 2004). A high degree of institutionalization refers to a condition in which an issue area such as climate policy is frequently addressed at the international level and institutions to regulate aspects of the issue area are already in place. There thus exists a high transaction density between actors in the issue area and existing institutions can function as focal points for creating new ones. However, the degree of institutionalization is a property of an issue area and thus a supporting condition for arguing, not an institutional feature subject to conscious design. Empirical research on normative institutional design has shown that institutional properties that further an institution’s legitimacy and are subject to conscious design are its transparency and publicness (Risse and Kleine 2010), the degree of equality between discourse participants (Deitelhoff 2009), the form of leadership occurring within the institutional setting (Risse and
Kleine 2010), and the certainty with which actors can identify their roles in the negotiation process (ibid). Also, an inclusive membership is expected to increase an institution’s legitimacy (Deitelhoff 2009) by increasing input-congruency and furthering equal access to the discourse.

The transparency and publicness of an institutional decision-making process increases throughput-legitimacy by allowing for accountability. Those responsible for a decision can, in a transparent process, be identified and thus held responsible for their actions. Since those involved in the decision-making process are aware of this scrutiny, arguing and reason-giving are encouraged over strategic bargaining since claims need to be justifiable to an audience with regard to an independent authority (such as scientifically established facts), rather than simply being based on narrow self-interest. At the same time, transparency does not establish how decision-makers can be held responsible – the issues arising from a potential lack of input-legitimacy remain prevalent.

A high degree of equality between discourse participants increases throughput-legitimacy by directly speaking to one of the basic principles of Habermas’ ideal speech situation: to secure the right of every participant to question any assertion, to introduce any assertion into the discourse, and to express individual attitudes, desires and needs. To increase equality, the discourse must thus be shielded from the workings of traditional interest and power politics. This is obviously extremely difficult to achieve.

The form leadership takes on is important for arguing because of the basis for authority it establishes for a negotiation. Authority that is based on expertise or moral competence furthers arguing while authority based on traditional power relations prevalent in the international system impedes it. In this context, institutional norms and procedures requiring a neutral chair in negotiations are especially important (Risse and Kleine 2010).

The last point, the certainty with which actors can identify their roles in the negotiation process, is important since when actors are uncertain of the roles they embody they are more likely to be open to argumentative reasoning than in cases where roles are fixed and certain. Fixed roles harden bargaining positions and lead to pre-defined ideas about appropriate behavior. Uncertainty about role identities can be achieved when institutional role identities overlap, so that actors become uncertain about their appropriate behavior. Role overlap can occur when institutional membership is diverse and not restricted only to diplomats. This would also increase input-legitimacy by increasing the range of represented interests. Uncertainty about role identities in an institutional setting takes on a mutual character, since other actors cannot be certain about the preferences of their negotiation partners, thus not knowing which incentives to offer and threats make in a bargaining situation. The result is an overall turn towards commonly accepted norms of appropriateness,
such as referring to scientifically established facts when making truth-claims. This increases the likeliness of actors changing their preferences with regard to the better argument.

Since the question whether legitimate regulation can emerge in an issue area depends strongly on the surrounding conditions of international politics, I will in the following section examine the international politics of SRM from an interest- and power-based perspective. This will make possible an assessment of the feasibility and effects of specific institutional design features, which I will assess in the last section of this paper.

3. Regulating geoengineering

Regulation at the international level does not proceed in a void. It is deeply embedded in the interest and power politics that dominate processes at the international level. This section thus examines two factors relevant to this fact: firstly, the problem structure of the issue under consideration and, secondly, the situation structure the international community is presented with when dealing with the issue. Based on the observations made regarding problem structure and situation structure, institutional design options aimed at increasing legitimate governance are then assessed with regard to their political feasibility.

3.1 The problem structure of SRM

The problem structure of an issue is described by examining its central aspects that determine whether conflicts over the issue can be expected to be consensual or dissensual. Consensual conflicts occur when there is a consensus on the desired goals, but no agreement on how to reach these goals. Dissensual conflicts occur when there is no consensus on the desired goals. Consensual conflicts are thus also referred to as regulatory conflicts, while dissensual conflicts can be referred to as distributive conflicts (Rittberger and Zürn 1990).

At first glance, the case of geoengineering with SRM might appear as a conflict over means rather than as a conflict over ends. The ends seem to be clear: the goal of applying SRM is to offset global climate change and to prevent a catastrophic and abrupt warming of the planet. But when closer examining the problem structure of SRM, this characterization appears imprecise. The specific outcome of an SRM intervention is unclear and is likely to differ regionally (Robock et al 2008; Rasch et al 2008; Jones et al 2010; Ricke et al 2010). This creates a potential for conflicts over ends, since not all actors in the international system will benefit from SRM. Instead, there are going to be winners and losers, as there are today winners and losers of climate change. While interests in SRM are likely to converge over time (in the long run, nobody will benefit from climate change), they are likely to differ in the short run. To understand whether and how regulation might proceed, it is thus important to analyze the immediate problem structure of SRM along specific criteria. I suggest five criteria
based on the Royal Society report from 2009: effectiveness, risk of unintended side-effects occurring, verifiability, timescale, and distributional effects.

The effectiveness of SRM technologies is generally considered high. Injecting sunlight-reflecting particles into the atmosphere, for example, would allow for a decrease in temperature the extent of which can be basically chosen freely. It has been suggested that with this particular technology, an ice-age could be induced by choice. The risk of unintended side-effects also is high in the case of SRM. Side-effects that might occur and negatively impact on regions include changes in precipitation patterns, which would lead to droughts (Robock 2009). Also, unintended side-effects might occur which have not been anticipated so far (ibid). The verifiability of the effects of SRM is inherently difficult, since detecting a climate “signal” and distinguishing it from “noise” is very difficult. This condition might be ameliorated through international cooperation in monitoring and evaluating climate data. The timescale on which SRM approaches operate is short (Keith et al 2010). Effects would be expected to occur almost immediately after deployment. This increases the likelihood of cooperation. Finally, the distributional effects of SRM are significant, creating winners and losers, as already mentioned above.

Working in favor of regulation on SRM from a problem structural perspective are thus its high effectiveness on a short timescale, and the expected benefits that arise from cooperation for verifying these effects. Making regulation more difficult is the high risk of unintended side-effects with significant distributional consequences, making the regulation of SRM a conflict over ends at least in a short to medium timeframe. But even though certain problem structural aspects of SRM thus speak against the likeliness of cooperation, it is these same factors, especially the potential negative side-effects for individual regions, which make it difficult for a state to justify unilateral action on SRM. A discursive institutional setting that demands such justifications would thus be especially well-suited to the case of SRM regulation.

3.2 The situation structure of SRM

The situation structure of an issue describes the possible courses of action available to states when dealing with the issue, and the resulting pattern of interaction. This is done in game theoretic terms. Four basic problematic social situations can be distinguished that result from the combination of possible courses of action: coordination games without distributional conflict, coordination games with distributional conflict, dilemma games without distributional conflict, and dilemma games with distributional conflict (Zürn 1992). The likeliness of an institutionalization of cooperation decreases from first to last. According to the problem structural analysis above, distributional conflict is likely to occur over SRM. But does the situation structure of SRM represent a coordination game or a dilemma game? The
essential difference between coordination games and dilemma games is whether there exists an incentive to defect from an institutional agreement after regulation has occurred, i.e. whether states are likely to resort to unilateral action. The question thus is: is unilateral action likely in the case of geoengineering?

SRM approaches have often been characterized as extraordinarily cheap, especially when their costs are compared to the costs arising from mitigation and possible unabated climate change (Schelling 1996; Barrett 2008). They also do not rely on collective action, as do conventional mitigation approaches; they can unfold their full effectiveness when deployed unilaterally. These properties of SRM approaches imply an inherent dynamic that makes their investigation and eventual deployment likely. Often, this is the argument set forth in calls for international regulation of research on and applications of SRM, referring to the urgency of preventing a single state from applying geoengineering unilaterally (Virgoe 2009; Davies 2009).

This line of reasoning can be questioned in several ways. The most obvious issue is in the end a technical question: if the deployment of an effective SRM technology (such as the injection of sunlight-reflecting particles into the stratosphere) turns out not to be sufficiently cheap to make it an attractive option for a single state attempting to offset the effects of global climate change, then voluntary cooperation among states becomes more likely. Since the actual costs of deploying SRM technologies are subject to an ongoing debate, this issue cannot be resolved yet and speaks neither in favor nor against a high likeliness of unilateral deployment. The more forceful critique of the above-stated line of reasoning claims that several other factors impact on the likeliness of unilateral deployment. The most convincing of these are, firstly, the threat of counter-geoengineering, and, secondly, the possibility of interferences occurring between uncoordinated geoengineering efforts of different states. The positive effects of cooperation in monitoring and evaluating data to detect a geoengineering “signal” has already been mentioned above. Other factors that have been set forth as working against unilateralism are possible negative impacts of SRM interventions on states that are allies of the state that applied SRM and the controls exercised by the public in democratic states. Since the last two considerations are usually dismissed by scholars of a realist persuasion as not relevant to the power politics at work in the international system, I will here consider only those factors that speak directly even to the parsimoniously defined concerns of realists: the threat of counter-geoengineering and the possibility of interferences between uncoordinated efforts.

The contribution of the first factor, counter-geoengineering, to whether or not a unilateral deployment of geoengineering is likely depends on whether technically feasible counter-geoengineering measures will be available to a state that may be negatively affected by another state’s geoengineering activities. The second factor potentially speaking against
unilateral deployment is more straightforward: to measure the results of large-scale testing and deployment in order to be able to adequately adjust the amount of SRM undertaken for reaching the desired outcome, international coordination of geoengineering measures is a prerequisite, since simultaneous SRM efforts by different states might interfere with each other. This is a functionalist argument in line with the reasoning of traditional approaches to institutional design, stating that cooperation between states on SRM will emerge because it furthers the interests of the involved parties. In order for states to reach their goal of intentionally altering the global climate in a desired direction, they will have to cooperate in order to avoid an undesired outcome, namely interferences between uncoordinated geoengineering efforts. This holds true whether states' interests on geoengineering converge or not; even in the absence of agreement on how to geoengineer the climate, cooperation is desirable in order to avoid undesired outcomes.

Which of the two scenarios (high likeliness for unilateral deployment v. low likeliness) is more accurate is important for assessing the probability of regime formation in the realm of SRM as well as the possible institutional structure a regulatory regime can realistically be expected to take on. While advocates for international regulation usually refer to a scenario of high likeliness for unilateral deployment, thus attempting to draw attention to the urgent need for regulation, in this scenario regulation is rather unlikely to occur. In the second scenario, in which the likeliness of unilateral deployment is reduced, regulation becomes much more likely. The second scenario represents the situation structure of a coordination game with distributional conflict, while the first scenario represents the situation structure of a dilemma game with distributional conflict. In both scenarios, however, international regulation is highly desirable to avoid tension and conflict and to assure a responsible handling of SRM. Which scenario turns out to be more realistic thus does not have an effect on the desirability of achieving a high legitimacy in SRM governance, while it does affect the probability with which legitimacy may be achieved.

In the following concluding section, I examine the institutional design options suggested by normative institutional design theory and aiming at increasing the legitimacy of an institution for governing SRM in the light of the problem structure and situation structure described above. I will focus on the implications of a situation structure resembling a coordination game with distributional conflict, the scenario in which cooperation is more likely to emerge.

4. Conclusion

Normative institutional design theory suggests a high degree of transparency, a high degree of equality between the discourse participants, leadership based on scientific or moral authority rather than on traditional power relations, and a high degree of uncertainty
regarding role identities to be conducive to an institution’s legitimacy. Also, an inclusive membership is expected to increase an institution’s legitimacy by increasing input-congruency and furthering equal access to the discourse. Assuming that regulation of SRM emerges at the international level, which of these institutional design properties seem politically feasible?

Transparency increases the accountability of an institution’s members by allowing for a clear identification of who is responsible for which decisions. Authority within an institution would thus have to be clearly assigned to a body in charge of decision-making on SRM, whose activities are openly communicated to the public. The latter is furthered by the close proximity between the high-technology of SRM and science, where the open publication of research is a common practice deeply rooted in the self-image of the participants. This could be made use of by including a scientific body such as the IPCC in the communication of the processes that occur within the institutional setting governing SRM. This seems a plausible course of action, and none of the identified aspects of SRM’s problem and situation structure speak against this form of regulation. Rather, the need for scientific cooperation to monitor outcomes actually pushes in this direction.

To establish equality between discourse participants is a very difficult task which is likely to never be fully accomplished, even in settings where there are no distributional conflicts involved. In the case of SRM, where large distributional conflicts are likely to occur, it appears almost impossible to shield negotiations against the workings of interest- and power-based politics. However, between the major actors in the international system with different interests in SRM there might not be large power-asymmetries. Actors such as the US, the EU, India, Russia, Brazil and South Africa might thus represent different regions and the interests they have in regard to SRM. This would nonetheless prohibit the equal inclusion of non-state actors and less powerful state actors in an issue area with as strong distributional consequences and such close proximity to vital questions of national security as is the case with SRM. An equal and inclusive membership for an institution for SRM governance is thus unlikely to emerge.

The last two institutional design features, leadership based on scientific or moral authority and uncertainty about role identities, are unlikely to be achieved for the same reason why non-state actors are not likely to be included in the political decision-making process on SRM. The close proximity of SRM to the national security of states will not allow for an effective shielding of negotiations from the traditional workings of interest- and power-politics. Leadership in an institution for SRM governance is likely to emerge from the ability to conduct SRM and the credibility to do so in the face of opposition. It is thus likely that those states capable of conducting SRM will bargain over whether and how to do so, while other,
less powerful states and non-state actors will bandwagon with those states closest to their interests. In this context, role identities are likely to be fixed.

This discussion has shown that an institutionalization of SRM governance is likely given the problem and situation structure of SRM, and that the best chance for increasing legitimacy through institutional design lies in the close relationship between SRM governance and science. While the other factors identified as furthering legitimacy are highly desirable as institutional features, they are unlikely to be implemented due to the strong distributional effects of SRM and its proximity to questions of national security. Scientists should thus have the responsibility to communicate to the public not only the results of their research, but also developments in decision-making on SRM in a future institutional setting. Institutionalizing this role of scientists in SRM governance should be a priority. Other attempts at influencing the policy process in institutionalizing SRM, such as achieving an inclusion of a multitude of non-state actors, do not seem a realistic endeavor. A possible venue for such public outreach activities is the IPCC, which is already involved in public outreach on climate change.

5. References


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