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## **Stakeholder networks in carbon governance: the role of state-market relations in the Indian renewable energy sector**

**Gudrun Benecke**

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# Stakeholder networks in carbon governance: the role of state-market relations in the Indian renewable energy sector

Gudrun Benecke

## Abstract

Climate change confronts countries like India with immense challenges. The demand for new modes of governance in India, as elsewhere, arises out of developing countries' dilemma that government as well as the market fails to adequately address climate change and human welfare. In the context of the international climate change regime, new modes of governance such as the Clean Development Mechanism (CDM) are institutionalised as alternative market-based policy devices. However, implementation of the CDM varies spatially. This paper focuses on the role of actor networks in specific local settings as a determinant of effective renewable energy governance. The case of the Indian wind sector demonstrates that, ultimately, state-market relations and interactions in evolving stakeholder networks are a prerequisite to effectively responding to challenges of climate change and development.

**Key words:** renewable energy; governance; India; Clean Development Mechanism; wind power

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## **Abbreviations and acronyms**

ANERT	Agency for Non-conventional Energy Resources and Technology
CDM	Clean Development Mechanism
CERC	Central Electricity Regulatory Commission
C-WET	Centre for Wind Energy Technology
IPP	Independent Power Producer
IREDA	Indian Renewable Energy Development Agency
KSEB	Kerala State Electricity Board
KSERC	Kerala State Electricity Regulatory Commission
LP	Local People
MNRE	Ministry of New and Renewable Energy Sources
MoP	Ministry of Power
MW	Megawatt
NGO	Non Governmental Organisation
OECD	Organisation of Economic Cooperation and Development
RE	Renewable Energy
SEB	State Electricity Board
SNA	State Nodal Agency
TEDA	Tamil Nadu Energy Development Agency
TNEB	Tamil Nadu Electricity Board
TNERC	Tamil Nadu Electricity Regulatory Commission
TNSG	Tamil Nadu State Government
UNEP	United Nations Environment Programme

## **Introduction**

### **Demand for renewable energy governance in India**

The challenge of tackling climate change while addressing immediate development needs increases the need to stimulate clean development through the use of alternative energy sources in order to secure energy supply and access for human welfare. Presenting the example of wind power deployment in India illustrates the energy governance dilemma in developing countries. The main argument of this paper is that state-market relations in actor networks matter for the effective governance (leading to deployment) of renewable energy (RE). This study is based on a series of interviews, observations and ethnographic mapping exercises with a range of local stakeholders during 2007-2008. The overall purpose is to analyse who governs and with what means, as regards renewable energy deployment in India.

This introductory section argues first that developing countries are not only confronted with a trade-off between development and climate change, but also with the dilemma of increasing government shortcomings in service delivery. Second, this highlights the potential of, and challenges to, RE deployment making a contribution to meeting energy and development needs. However, it also calls into question the extent to which alternative energy paths such as renewable energy deployment can be embarked upon. The introduction concludes with a discussion about the conditions for the effective implementation of RE services in non-OECD countries and the catalytic potential of new modes of governance such as the CDM.

### **Cruel choices: development in a carbon-constrained world**

Developing countries are confronted with fundamental threats to human welfare and security in today's globalised world (Amin 1999). Energy provides one example of how poor people are deprived of basic living conditions due to the lack of access, affordability and security of supply and service delivery. Governments in countries like India face the overwhelming task of providing public goods and services to ensure minimum welfare requirements and to tackle global phenomena including climate change. In the case of energy, providing access and security of energy supply is defined as fundamental governance function (Abbott 2001); hence the deployment of renewable energy projects constitutes a link in the chain towards effective energy governance.

Considering future energy projections, India will represent a third of global energy demand by 2050, which will place an immense stress on existing energy resources (Greenwood et al 2007: 45). Furthermore, due to the poor shape of the Indian energy sector, the quest for alternative sources assumes particular importance (Ramana et al 2001: 5). Energy generation is inadequate to meet increasing demands as power shortages peak with about 20% below energy requirements (PowerLine 2007: 12). India suffers from an inefficient energy technology stock, a failing energy governance system and a high dependence on primary energy sources for commercial fuels (Ramana et al 2001: 3). This also has detrimental local and global environmental impacts. Yet, the pressing energy demand and current shortcomings in supply present India with a dilemma over whether to trade off environmental concerns against development. Given the present scenario and prospective economic growth and hence energy demand projections, an important question is how India might tackle its energy problem.

In order to meet the Government's objectives of energy security by 2020 and energy independence by 2030 (Greenwood et al 2007: 45), RE has become a priority sector. RE deployment promises to contribute to social sustainability by improving accessible and affordable energy supply – an essential governance service. RE also has the potential to

meet challenges of energy security and energy supply. RE resources are abundant and have increasingly become more cost competitive in relation to conventional power (Elliott 2007). With regard to the geopolitical dimension, most of the available fossil fuel resources are located in, or transit through, politically sensitive areas (Asif & Muneer 2007). In contrast, renewable energy resources are indigenous and therefore decrease energy dependency as well as developing countries' concerns about being dependent on other countries to meet domestic energy security objectives (Greenwood et al 2007).

### Empirical Realities – Governance of RE Sources

Nearly all parts of the world benefit from some natural resource endowment that could be harnessed for various applications (Richards 2006). Despite this basic precondition for sustainable energy generation, there is considerable variation in whether and how RE sources are utilised.

Wind energy deployment in India illustrates this puzzle since wind power constitutes the most advanced RE technology in the Indian RE sector. Wind energy generation contributes roughly 70% of RE capacity installed in India. The Indian wind sector is described as nearly commercialised, i.e. a viable business sector independent of government subsidies, and also plays an important role in the global wind energy scenario (Bakshi 2006). However, despite the remarkable record of the Indian wind industry nationally as well as globally, it is puzzling that the state of Tamil Nadu has made significant progress harnessing its wind potential while the neighbouring state of Kerala has barely begun to realise its wind power potential (Table 1).

Table 1: Wind energy deployment in India (Source: MNRE 2008)

State	Installed wind capacity (MW)	Wind power technical potential (MW)	Utilisation rate (%)
<b>Tamil Nadu</b>	<b>3873</b>	<b>4750</b>	<b>81.5</b>
Maharashtra	1756	3650	48.1
Gujarat	1253	9675	13.0
Karnataka	1011	6620	15.3
Rajasthan	539	5400	10.0
Madhya Pradesh	188	5500	3.4
Andhra Pradesh	123	8275	1.5
<b>Kerala</b>	<b>2</b>	<b>875</b>	<b>0.2</b>
West Bengal	1	450	0.2
<b>India</b>	<b>8746</b>	<b>45195</b>	<b>19.4</b>

Several lines of argument are proposed to explain this variation. Some debates consider technological maturity or contextual preconditions (Worrell et al 2001) whilst others indicate that it is the variation of natural resource endowment that accounts for differences in natural resource exploitation (Auer 2008). The accessibility of natural resources, which in the case of wind concerns the wind regime and the availability of adequate sites, has also been cited as a possible explanation (Golait et al 2007). This paper sets out to explain the underlying reasons for spatial variations in how wind resources are deployed for power generation. It assumes that socioeconomic, political and economic explanations suggested by previous empirical studies fall short of answering this puzzle (Benecke 2010). For this purpose, state-market relations are examined as contextual requirements for effective RE deployment in a developing country setting. The concrete focus is on the role of governance arrangements,

particularly stakeholder networks, to analyse who is governed, by whom and by what means.

### **Alternative solutions – Government and governing**

This section justifies the need to examine the governance of renewable energy in the framework of stakeholder networks in order to harness the potential offered by new policy instruments like the CDM. Persistent obstacles to effective RE penetration call for the establishment of new modes of governance to tackle the global challenge of climate change. Impediments relating to finance, technology and research and development (R&D) are common among developing country experiences with RE deployment but are difficult to overcome in developing country contexts (Asif & Muneer 2007). Governments may not have the capacities and capabilities, or may lack the political will, to support alternative energy paths to circumvent the development versus climate dilemma. Increasingly, non-state actors and non-hierarchical modes of steering play an important role both in market regulation and taking over government functions as quasi-policy vehicles. Consequently, new modes of governance such as market-related international policy instruments like the Clean Development Mechanism (CDM) are considered as channels to trigger processes such as RE deployment in developing countries.

The point of departure for the design of such policy devices is to internalise environmental cost in market instruments as an alternative to public command and control, or private self-regulation (Fuhr et al 2007). Approaches to integrate private actors into the provision of public goods or services are based on the assumption that private actors are capable of having policy impacts due to the privatisation, liberalisation and deregulation processes experienced worldwide (Brühl et al 2004). This implies that for the stimulation of RE deployment in developing countries, private capacities are consciously used. One example of a new mode of governance in the realm of international climate politics is provided by the CDM. But to what extent has the CDM successfully promoted wind energy deployment in India?

As illustrated in Figure 1, the CDM reflects the uneven pattern of spatial distribution in RE resource deployment. In other words, states like Kerala that host no wind energy projects also do not benefit from CDM activities, while wind power states like Tamil Nadu fully reap the monetary incentives selling the certificates generated through setting up CDM projects (Benecke et al 2008a). This emphasises the importance of exploring the underlying conditions for effective RE governance in terms of who is governed, by whom, by what means and with what implications. This paper will proceed to explore the conditions for effective renewable energy deployment guided by a governance theory-based framework for analysis (Newell et al 2009). This provides the analytical and conceptual approach required to understand multilevel and multi-stakeholder agency in the context of looming energy-development-climate crisis in developing countries like India.

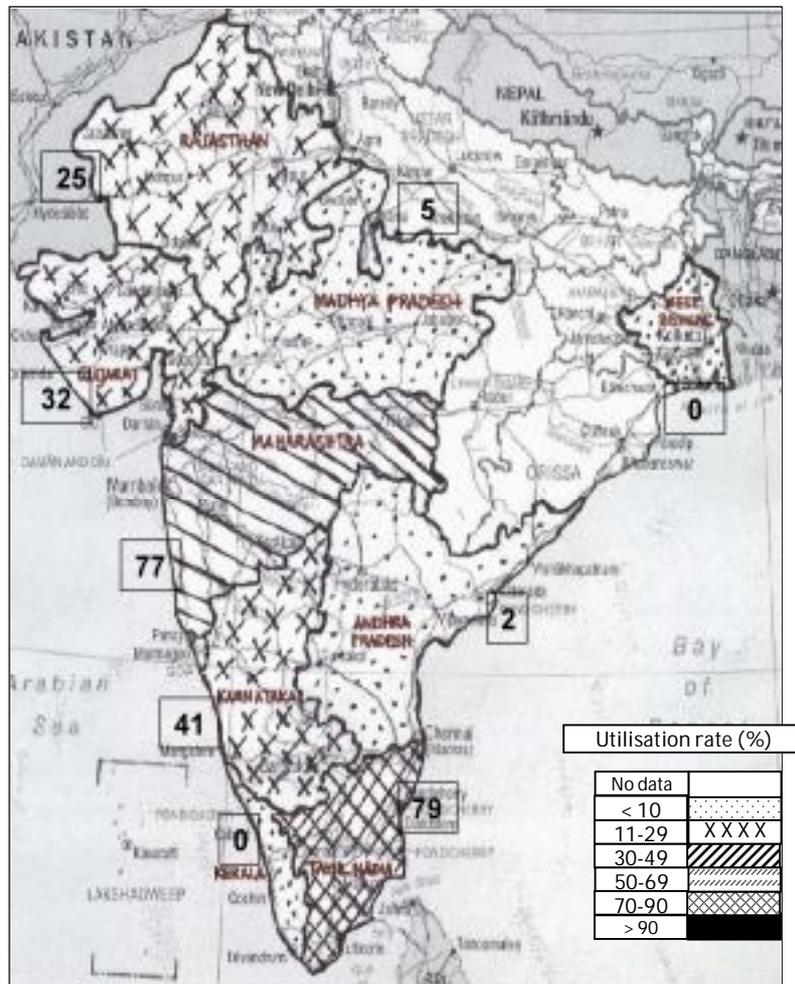


Figure 1: Utilisation rates of wind power capacity and CDM Wind Projects in India (shown in rectangular boxes). Source: UNEP Risoe (2007; 2008); MNRE (2008)

## Governing Clean Development

### Governance in the context of environmental and climate politics

In the course of moving towards expanding RE options to meet developmental and climate-related objectives, the Indian energy sector constitutes a prominent example of how state-market relations can change. Governance theory helps us to understand and explain the governance structures and mechanisms in developing countries. As this paper argues, a consideration of governance theory facilitates the exploration of prerequisite conditions for the effective deployment of renewable energy.

Here, governance is understood as institutionalised modes of coordinating societal activities towards collectively binding rules and/or the provision of collective goods for a defined group of people (Risse & Lehmkuhl 2007: 20). Governance processes and structures aim to provide collectively binding rules, collective goods and services involving a variety of actors in non-hierarchical modes of steering, for example, through incentives or horizontal coordination (Göhler 2007).

Governance perspectives tackle three important questions: First, who governs and towards whom are governance arrangements directed; second, how and with what means does governance take place; and thirdly, what impacts are exerted in the process of governing and who actually benefits (Benecke et al 2008b). In this sense, governance perspectives reflect questions of power (Mayntz 1993). Lately, the governance concept

has been applied outside the OECD context (Risse & Lehmkuhl 2006) revealing the conceptual problem that the whole terminology relies on the notion of the modern (OECD) state and the separation of private and public spheres (Draude 2007: 6; Risse & Lehmkuhl 2007: 14). Such differentiation is not compatible with realities in most developing countries where borderlines between public and private, or state and non-state, actors are blurred (Reno 1998; Zürcher 2007). Consequently, this calls for the acknowledgement and identification of so-called functional equivalents to a Western understanding of governance, namely alternative actors and means of providing governance services such as RE deployment.

Presenting the example of the wind power puzzle in India, this paper makes the case for taking a governance framework of analysis in the analysis of RE deployment. Traditionally, energy sectors in developing countries are characterised by classical modes of hierarchical steering. This means that government is not only in charge of setting the framework conditions and regulating business behaviour. Government in many cases also takes full ownership of power generation, transmission and distribution. The Indian energy sector as a whole is dominated by the state, has little private sector activity and displays weak state-market relations (Rao 2004).

However, the RE sector presents a markedly different picture. Government dominates the establishment and implementation of rules and regulations for this sector. However, the generation of power from RE services is almost 90% in the hands of private parties (Mable & Fernandez 2008). Transmission and distribution of electricity again is under state control due to public ownership of the respective infrastructure. Government policies that aimed explicitly at increasing private participation in power generation are the main reasons for more active private sector engagement. State-market relations are characterised in a different manner with greater flexibility and dynamics inherent in public-private interactions.

Boundaries between providers and recipients of these governance services also become blurred as private parties receive governance services, such as infrastructure and regulations, as well as provide services through electricity generation. In this context, the CDM provides an entirely new mode of governance for RE that departs from the dominance of state-led steering.

RE deployment in developing countries is constrained by the lack of sufficient finance, technology and knowledge as well as access to knowledge-based or epistemic communities (Haas 1990). The CDM hence responds to the demand for involving multiple actors across the multi-level system in non-hierarchical modes of steering and various processes such as technology transfer and policy diffusion. Consequently, applying the governance framework to analyse renewable energy deployment not only serves to further understanding of enabling conditions, but also captures the different stakeholder and interactions involved and emerging through new instruments like the CDM.

### **Prerequisites for effective governance**

In the case of wind energy in India, deployment rates differ between states despite similar natural resource potential. This uneven distribution of deployment is also reflected in the spatial distribution of CDM activities in the sector, raising the question of what prerequisites are necessary for effective RE governance that culminates in the successful deployment of wind projects. Two main approaches have been selected, based on previous empirical studies, to explore the potential contextual requirements. As will be shown, these are inadequate to grasp evolving stakeholder networks in terms of actors, their attributes as well as their relations and interactions characterising

renewable energy governance. The last section suggests a governance framework and stakeholder networks as analytical and conceptual devices to explore preconditions for wind power deployment.

The first set of empirical studies on RE deployment in developing countries suggests that issues such as policy and regulatory outcomes, public institutional performance and effectiveness, organisational behaviour and policy-making are key in determining RE deployment. Neo-Institutionalist approaches and public policy literature propose potential explanations of why and how RE deployment takes certain directions that relate to political institutions and outputs (Scharpf 2000: 770). Transaction costs, path dependencies, organisational routines and external institutional environment are important in determining successful RE deployment (Peters 1999). Three aspects are identified as important entry points for understanding how policy conditions influence wind power deployment and require further consideration:

- i. The historical and institutional environmental context is important in shaping certain expectations and behaviour, opening windows of opportunity and creating development paths;
- ii. The structure and characteristics of organisations at the national level appear relevant for their pro-active behaviour;
- iii. Attitudes, interests and leadership at the organisational local level emerge as influential for driving positions and activities in the wind energy sector.

The field of organisational sociology promises comprehensive insights into the logics of organisations (Merton 1968), integrating all actors involved in relation to how “functional behaviour” is explained and reflects on RE governance. The main argument proposes that under certain conditions organisations can produce unanticipated, negative outcomes that deviate from the formal design and normative expectations (Vaughan 1999). Applied to RE deployment in India, the following three aspects are relevant in explaining the impact of governance actors on effective governance (Merton 1968; DiMaggio & Powell 1983; Finnemore & Sikkin 1998; Vaughan 1999). First, *capacities* such as the wind power budget, internal and external staffing, and their expertise and autonomy in relation to resource use and independent decision-making. Second, *interests* pertaining to the motivation, attitudes and role of individuals and the organisation, attitudes of leaders, and the organisational reputation in terms of accessibility and efficiency. The third factor considers *capabilities*, the history and experience of stakeholders with regard to wind and RE. These concepts provide meaningful entry points to address questions of who governs and who is governed.

The second set of empirical studies on RE deployment in developing countries suggests that classical location factors will be inadequate for fully understanding governance and agency in the wind sector. In most of the Indian states, opportunity structures per se are relatively similar; however, what economic actors make of them differs. These observations point towards the importance of relations, interactions and networks between stakeholders. Since the ways in which stakeholders engage in economic activities and tap into existing opportunities appears to matter, new economic sociology literature is here considered (Glückler 2006). This approach can be applied to the case of renewable energy governance as economic activity. The point of departure is that the overall economic performance in terms of effective RE governance depends on how actors are embedded in emerging arrangements and how the interactions evolve in network structures. New economic sociology debates propose the concept of ‘embeddedness’ (Granovetter 1985) as relevant to an exploration of how stakeholders shape and utilise opportunities for wind power deployment. Embeddedness describes the integration of actors into relations and structures with other actors that produces

certain dynamics and effects on economic activities like wind power deployment (Granovetter 1985). In essence, actors' relations comprise the two elements of dyadic ties and interaction constellations between stakeholders involved in RE governance in the wind sector. Dyadic ties are defined according to attributes of reputation, social capital and formality (Burt 1992, Emirbayer & Goodwin 1994, Bathelt & Glückler 2003, Hite 2003). The characterisation of dyadic ties, representing relations between stakeholders, enables the identification of typologies of actors' arrangements characterised by similar types of ties. Interactions in network constellations between stakeholders constitute another feature that characterises networks. Looking at the relations and interactions between stakeholders involved in RE governance, economic sociology literature allows for identifying and interpreting how stakeholder relations and interactions affect processes and outcomes of renewable energy governance.

### **Role of state-market relations for effective energy governance**

The analysis above implies that the questions of who governs and how governance takes place in the context of RE governance are relevant for understanding successful governance outcomes such as wind power deployment. Exploring state-market relations tackles these questions of who is governed, by whom, how and with what means; all of which have implications for the effectiveness of governance. This section elaborates on how stakeholder networks serve to uncover state-market relations in response to these questions.

Stakeholder network analysis provides an analytical framework for understanding network effects on RE governance. Stakeholder network analysis initially considers the question of who is governed by whom. Drawing upon organisational sociology, stakeholder network analysis focuses on the governance actor as a critical element of networks and examines characteristics in relation to other stakeholders and the overall context of RE governance. Stakeholder network analysis can then be employed to address the question of how governance takes place. In this context, relations and interactions between governance actors are explored in the light of new economic sociology debates (Richter 2001). The analysis of social networks focus on the interaction of interdependent actors and the unit of analysis is based on actors as well as their relationships (Thatcher 1998: 398).

Here, an explanatory model is developed (figure 2) based on stakeholder network analysis that aims to explain effective RE governance in the context of locally specific state-market relations. In the first instance, new empirical realities require a bottom-up understanding such that attention focuses on what local conditions in terms of stakeholder attributes and relations in networks look like in reality and how they impact on wind power deployment. Given these circumstances, the specific characteristics and dynamics of state-market relations are relevant for understanding governance outside the OECD world. This also makes the case for a stakeholder network approach in order to enable a detailed analysis of multi-level and multi-stakeholder realities.

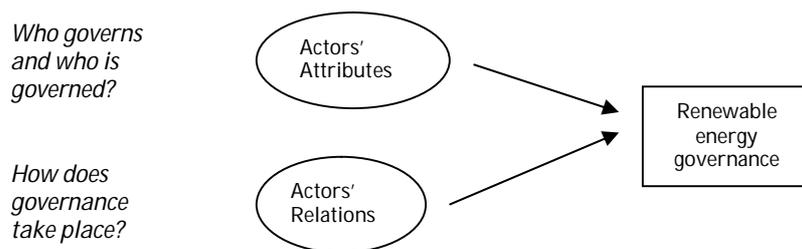


Figure 2. A governance research framework

On the whole, RE stakeholder networks are conceptual devices that, from an overall governance perspective, can serve to grasp governance arrangements in non-OECD settings. RE networks comprise stakeholders characterised by their attributes as well as stakeholder relations. Networks are dynamic and evolutionary. Distinctive forms of RE networks emerge out of the interactions between these constitutive elements in the context of emerging, locally specific demands on RE governance. Interactions and relations in networks produce facilitating and impeding effects in both an intentional and unintentional manner on RE governance (Thatcher 1998: 406). These effects involve agency exercised at multiple levels. RE stakeholder networks are necessary conditions for effective RE governance in terms of successful RE deployment. In addition, RE stakeholder networks exert multi-level effects through several causal mechanisms on output and impact dimensions of RE governance. External stimuli in terms of new modes of governance might trigger the emergence of effective RE governance by promoting implicit processes or changes in stakeholder networks, given a critical mass of stakeholders or a combination of internal and external circumstances.

In the case of the Indian wind sector, energy stakeholder network effects depend on access, brokerage, information and asset exchange and involve mechanisms of trust as well as transaction cost considerations. Enabling conditions that render stakeholder networks effective in terms of, for example, the successful deployment of wind power projects, relate to the openness of the environment towards renewable energies in the entire multilevel energy governance system. This provides specific windows of opportunity and channels for the diffusion of ideas and practices. RE stakeholder networks are also subject to change and involve an important time dimension. In conclusion, stakeholder network analysis facilitates the identification of who is governed, by whom, how, with what means and effects.

## Case study: Stakeholder networks in the Indian wind sector

### Stakeholder networks in the Indian wind sector

State-market relations are considered crucial in shaping RE governance. Literatures discussed above suggest that policy conditions interrelate with market processes. Multilevel stakeholder networks that embrace both state-market and multi-stakeholder relations and interactions emerge as decisive for RE governance. The following stakeholder network analysis explores state-market relations in the case of wind energy in the contexts of Kerala and Tamil Nadu, focused on who is governed by whom, with what means, and how.

Governance providers are identified as actors that are responsible for the structures and procedures required to ensure the delivery of services in the field of RE. These range from the design of policy baselines, governance institutions and processes to implementation support and involve the same kinds of institutions and organisations in

all Indian states. At the central level, the Ministry of New and Renewable Energy Sources (MNRE) takes the lead, advising on non-binding policy guidelines and regulations to the states and channelling the subsidies and funds for programmes and other initiatives to promote RE. The Ministry of Power (MoP) and the associated Central Electricity Regulatory Authority (CERC) coordinate power-related activities pertaining to power regulation and electricity transfer. With regard to the local level, the most important stakeholders are State Government, specifically the Energy Department that is responsible for policymaking and implementation for energy and wind energy issues. The State Electricity Board (SEB), as electricity utility, is assigned with the tasks of grid management, grid infrastructure, wind power purchase and transmission and distribution of wind power<sup>1</sup>. The State Electricity Regulatory Commission (SERC) was institutionalised under the Electricity Act 2003 and the Electricity Regulation Act 1998 to respond to the need for greater regulatory oversight and direction in the electricity sector. This semi-autonomous institution is assigned with the tasks to independently arbitrate, fix and oversee the implementation of regulations for wind sector stakeholders, including generators, suppliers, transmitters and users of these electricity services. The State Nodal Agency (SNA) promotes RE deployment at the local level by channelling central-level subsidies, implementing demonstration projects and providing assistance to interested parties.

Governance recipients are those stakeholders in RE governance that benefit from receiving RE services. Defined in terms of end product or outcome of the RE governance process, electricity is delivered to the people that are constituents of a specific local area as assigned by local authorities. Local citizens are often not organised in any manner and do not have an official stake in the process. Regarding other civil society actors, neither NGOs nor media actors feel compelled to argue the case for wind energy or to defend the rights of affected communities. Nevertheless, local residents are the key expected beneficiaries from governance service delivery and are also directly affected by wind farm installations.

The distinction between governance providers and governance recipients that so far classically differentiates public and non-state actors cannot be applied when it comes to the private sector. Business actors have a dual role in the RE governance process. On the one hand, private sector companies are governance providers as they generate and deliver RE services in terms of electricity to local constituents. On the other hand, business actors are also governance recipients since they depend on governance services, such as the provision of appropriate governance structures and procedures, in order to operate. To complicate matters further, private sector stakeholders are to some extent involved in setting the appropriate framework conditions for their own engagement in electricity production. Through lobby activities with regard to state government and official involvement in regulatory processes, public and private actors engage together in the provision of governance framework conditions.

### **Who governs and who is governed?**

Figure 3 illustrates the relevant stakeholders involved in the governance of renewable energies taking the example of the wind sector in the two states of Tamil Nadu and Kerala. An initial assessment of these actors involved in RE governance in the wind sector in Kerala and Tamil Nadu states reveals surprising similarities as regards who is being governed by whom.

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<sup>1</sup> Furthermore, issues such as selling wind power to third parties or allowing wind power to be used for captive consumption also lie within the responsibility of the Tamil Nadu Electricity Board (TNEB).

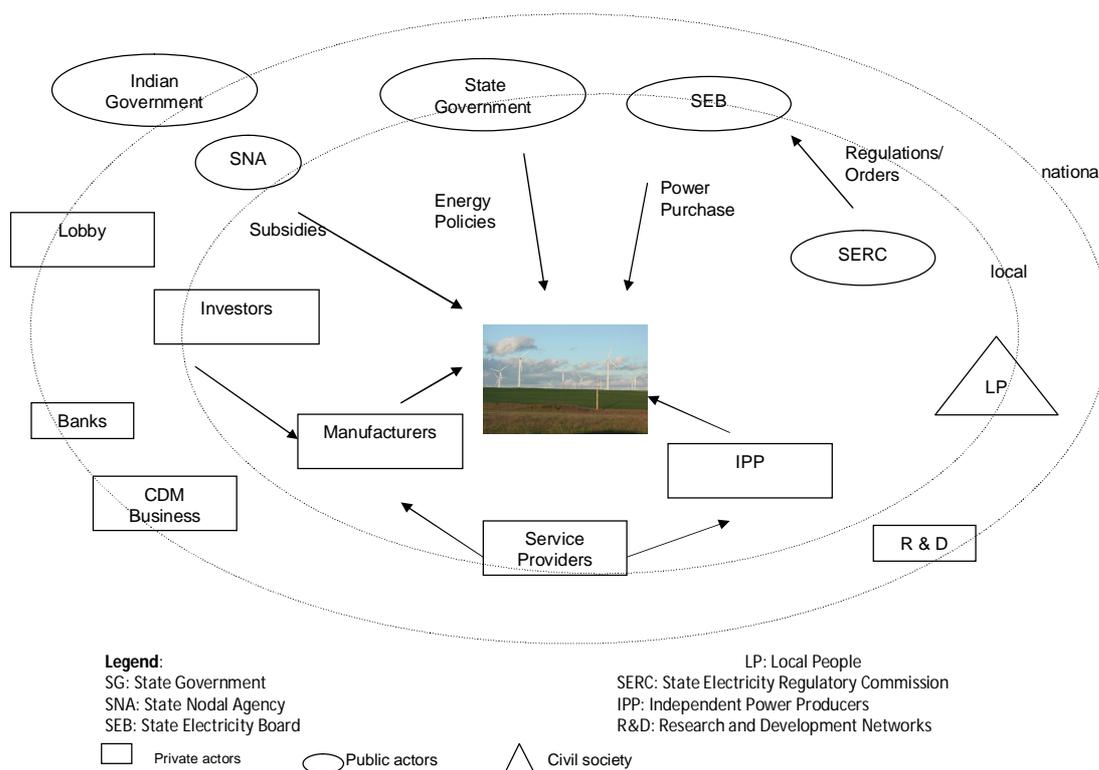


Figure 3: Indian Renewable Energy Sector - Stakeholder Constitution.

While the involvement of public actors in renewable energy governance has already been discussed, the focus is now turned towards private agency in renewable energy governance. The emphasis on the selection of relevant market actors is explained by the changing importance of market actors in previously state-dominated affairs such as energy governance.

With regard to the private-sector engagement, the most important stakeholders in wind energy deployment in the Indian context are *manufacturers*<sup>2</sup>. The wind turbine manufacturer Suzlon was selected for this analysis as representative of this industry due to the fact that Suzlon is an Indian company that holds about 50% of the market share. Increased power sector liberalisation opens avenues for new actors such as *Independent Power Producers* (IPP) to provide alternative business models in the wind energy segment through the third party sale of wind power. IndoWind was selected for this paper as the most representative IPP, as very few actors have so far engaged in the IPP role. To a large extent, demand for wind power installations results from *investors* who are not involved in the wind deployment procedure *per se* but invest for different reasons such as independent power supply or tax benefits<sup>3</sup>. Ashok Leyland represents a typical case of an investor whose core business is in the automobile sector. *Service providers* include a range of actors from knowledge brokers, suppliers of different technical parts for wind farm installations, legal and financial service providers to

<sup>2</sup> Due to the oligopoly structure of the wind energy market, manufacturers have a significant stake and power in shaping market and business developments.

<sup>3</sup> Hence power requirements for internal consumption are immense, as are investment appetites, encouraged by the promise of tax benefits.

different types of consultants. The Centre for Wind Energy Technology (C-WET) was selected for study as a consultancy that engages in turbine testing and a wide range of consulting activities with regard to wind farm installation procedures all across India. Lastly, even though *wind lobbyists* represent and argue the case for wind turbine manufacturers and investors at a national level, they were identified as particularly relevant for arguing the case for wind energy deployment in the local context of Tamil Nadu.

In summary, with regards governance of the RE sector, distinctions between governance providers and recipients as well as between state and market are blurred. Even though governance stakeholders *per se* are similar in each Indian state, their ambiguous roles imply some scope for locally specific action. As will be demonstrated in the following, this depends firstly on the characteristics of actors and secondly, on how governance takes place in the context of actors' relations.

At this stage, attention is drawn to qualitative aspects that concern the characteristics of governance actors and explore the extent to which actor attributes determine RE service delivery. Table 2 summarises the main results of the stakeholder network analysis that were used as the basis for exploring the characteristics of governance actors according to the criteria suggested by organisational sociology literature:

Table 2: How is wind energy deployment governed? A closer look at actor attributes

	Tamil Nadu	Kerala
<b>Actor Attributes</b>	<ul style="list-style-type: none"> <li>• Highly-favourable actors' attributes with regard to wind; symmetrically characterising the organisational context of the majority of stakeholders</li> <li>• Attributes of <i>public actors</i> reflect high interest and staff quality prominent in organisational routines and leadership</li> <li>• Attributes of <i>private actors</i> display high experience and resources</li> <li>• <i>Civil society</i> actors' attributes are low given the absence of resources and organisation</li> </ul>	<ul style="list-style-type: none"> <li>• Less favourable actors' attributes for wind energy deployment; asymmetrically characterising different stakeholders</li> <li>• Attributes of <i>public actors</i> reflect low interest and staff quality in organisational routines and cultures despite individual leadership efforts</li> <li>• Attributes of <i>private actors</i> suffer from low experience</li> <li>• <i>Civil society</i> attributes reveal some capabilities but negative attitudes to wind energy</li> </ul>

Governance in the Tamil Nadu case is characterised by highly favourable actor attributes that drive stakeholder engagement in RE governance. For example, among public actors a strong orientation towards RE deployment exists in terms of human resource aspects and political will. Private actors are also willing to invest resources and take advantage of experience with regard to wind power deployment. This means that governance providers comprising public as well as private actors are characterised by favourable attributes such as capacities, capabilities, interests and attitudes to engage in RE governance. Private sector stakeholders as indirect governance recipients and providers display favourable attributes, which allow for the effective delivery of governance services. Local people as governance recipients reveal rather weak characteristics, in terms of exercising voice and accessing resources. This raises interesting issues for further debate on power and equality, legitimacy and effectiveness of RE governance.

In contrast, the Kerala case shows that governance actors characterised by unfavourable attributes with regard to wind power prevent effective RE governance. Public actors do have the necessary resources and experience but lack interests, qualification and political will in terms of the willingness to promote renewable energies<sup>4</sup>. Despite evidence of individual leadership, the organisational culture and characteristics in some institutions like the SNA remain unfavourable towards wind energy. Private actors have little experience in the local context but recur to substantial financial and human resources. Surprisingly, civil society actors feature more prominently, but demonstrate more negative attributes than in the Tamil Nadu context, as their attitudes remain unfavourable towards wind energy despite the higher level of education on such issues.

In terms of governance providers, the Kerala case implies that the above-mentioned unfavourable characteristics of public actors constitute unfavourable prerequisites to the effective governance of renewable energy. This has a feedback effect on private actors. In their role as complementary governance providers, the imbalance between the favourable private sector characteristics versus the less supportive public and civil society attitudes erects barriers to meaningful contributions to the RE processes. Private stakeholder activities such as the installation of wind farms are impeded by the lack of appropriate governance structures like single window clearance systems. Local people as governance recipients are characterised by more outspoken and adverse attributes than the local constituency in Tamil Nadu. However, the culture of protest and history of negative experience with environmental projects, e.g. large hydro plants, implies difficulties in satisfying local people's demands in the local context of Kerala. This suggests potential explanations for why RE governance in this local context might be a more contentious issue. In summary, this analysis suggests that the focus on governance actors and structures alone is insufficient for understanding the complexities of RE governance. An appreciation of *how* governance takes place is required.

### **How does governance take place?**

The focus on who governs and is governed sets the context for how service delivery actually takes place. In order to explain differences in wind energy deployment between states with similar governance structures but actors with different attributes requires the examination of how governance takes place. For this purpose, stakeholder network analysis is applied to look at the relations and interactions between governance actors. The main results derived from ethnographic research are contrasted in two stakeholder network mappings (Figures 4 & 5). In the case of Tamil Nadu, stakeholder relations emerge as embedded in a network of trusting relations. On this basis, interactions evolve between public and private sector constellations in a constructive and mutually supportive manner (Figure 4).

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<sup>4</sup> Interviews with public sector officials from Kerala during field research in India 2007-2008

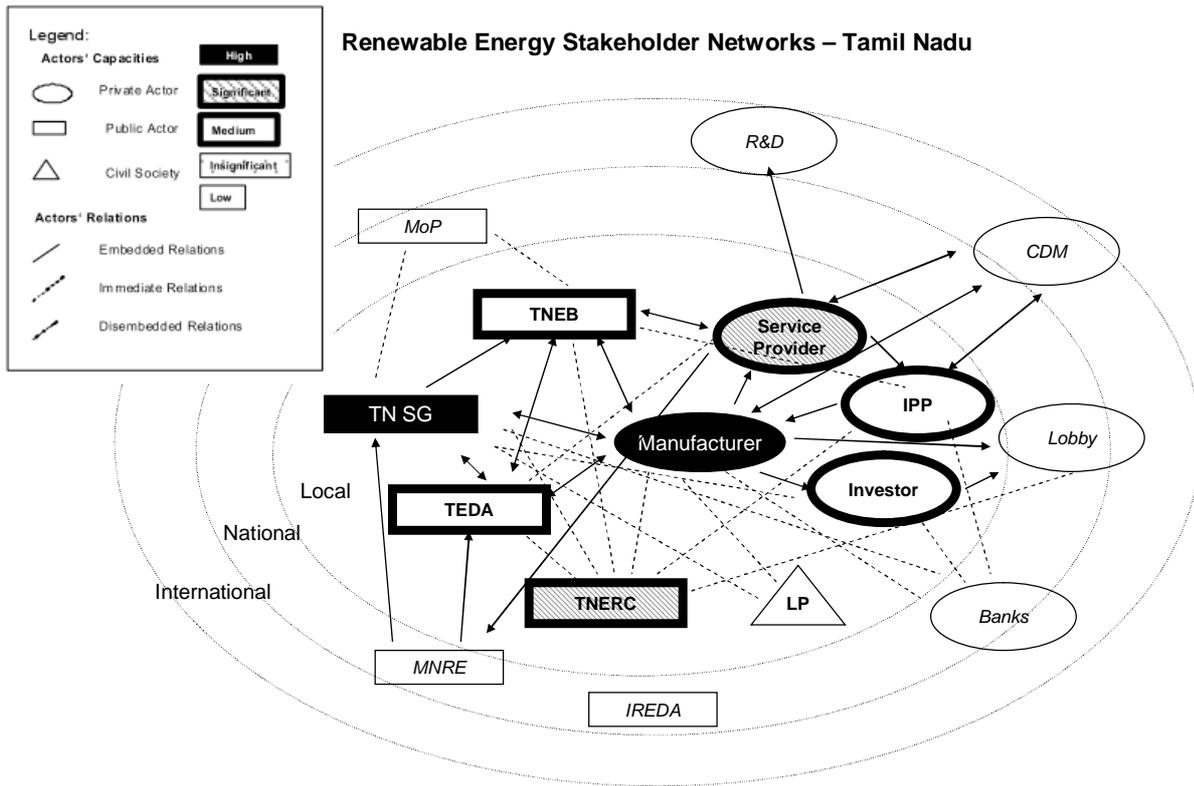


Figure 4: Tamil Nadu RE Stakeholder Network<sup>5</sup>

MNRE: Ministry of New and Renewable Energy Sources  
 IREDA: Indian Renewable Energy Development Agency  
 TNERC: Tamil Nadu Electricity Regulatory Commission  
 TNSEB: Tamil Nadu State Electricity Board  
 TEDA: Tamil Nadu Energy Development Agency

MoP: Ministry of Power  
 R&D: Research & Development  
 CDM: Clean Development Mechanism  
 IPP: Independent Power Producer  
 LP: Local People

Stakeholder relations are such that public and private actors are relatively embedded in emerging actors' arrangements that feature low degrees of formality and significant amounts of interaction intensity and quality. A surprising outcome is that the majority of actors' arrangements are characterised by dyadic ties with less emphasis on factors such as social capital and reciprocity. This relates to the scope and scale of actors' relations and interactions that utilise the entire multilevel network and implies the importance of space, locality and time for embedded ties to emerge in actor arrangements. Furthermore, interactions take place in networks structured in quite an open manner particularly on the part of key private sector players.

In essence, stakeholder network analysis for Tamil Nadu concludes that how governance takes place and what means are employed becomes visible in the relations and interactions between multilevel stakeholders. Public sector governance providers are bound in formal relations but have developed some level of reciprocity and trust. This facilitates communication and the establishment of supportive structures and procedures to serve the common purpose of wind deployment. In this process, the type of relations and interactions between public and private actors determines the role of private actors as governance providers. Due to the evolving mutual relations and trustful interactions, framework conditions that serve the interests and purposes of private sector stakeholders have been established. In their role as governance

<sup>5</sup> The stakeholder network mappings in the selected cases of Tamil Nadu and Kerala are results of an ethnographic research method involving interviews with selected public, private and civil society stakeholders.

recipients, this emerged as a precondition for private actors to effectively take up operations in electricity generation.

In the case of Kerala, the mapping illustrates that stakeholders are bound together in relations that are *disembedded* in the overall network with little social capital and trust based interactions (figure 5). In contrast to the governance setting in Tamil Nadu, the Kerala case reflects a greater variety of emerging actor arrangements. On the whole, actor relations are characterised by disembedded ties of low quality and high formality. This is particularly true for actor arrangements involving relations between public and private stakeholders. However, public actor arrangements are also characterised by formalistic elements enhancing mutual dependencies and a focus on “proper process” that allows for little flexibility and access. The emerging actor arrangements between private actors extend beyond the state-level boundaries and feature embedded ties. The Kerala case illustrates that interactions in structurally closed constellations are detrimental for wind energy deployment. Particularly the fact that interaction constellations between public actors are constituted of formalistic ties impedes exchange with and access to private stakeholders.

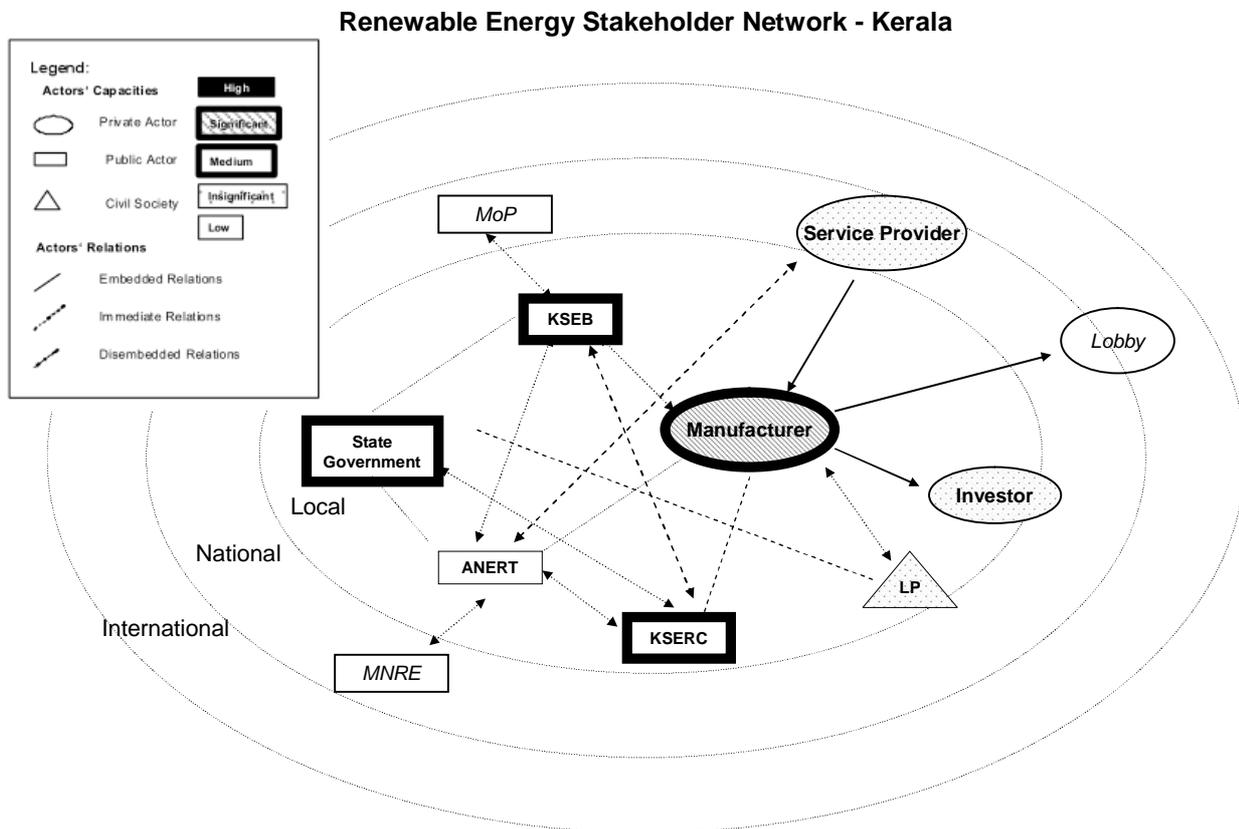


Figure 5. Kerala RE Stakeholder Network

MNRE: Ministry of New and Renewable Energy Sources  
 IREDA: Indian Renewable Energy Development Agency  
 KSERC: Kerala State Electricity Regulatory Commission  
 KSEB: Kerala State Electricity Board  
 ANERT: Agency for New Energy Resources and Technology

MoP: Ministry of Power  
 R&D: Research & Development  
 CDM: Clean Development Mechanism  
 IPP: Independent Power Producer  
 LP: Local People

In summary, the Kerala case confirms that the nature of relations and interactions between stakeholders explain how and with what means RE governance takes place.

Particularly between governance providers comprising public and private entities, relations are characterised by little common understanding. Interactions are based on a limited amount of trust and reveal very formalistic tendencies. This impedes the agreement on and establishment of supportive governance structures and procedures. This lack of access to public actors and the invisible deployment hurdles they impose through over-regulation on private stakeholders render the implementation of governance structures and the effective delivery of RE services difficult. In addition, the strained relations between private actors as service providers and local people as governance recipients, poses obstacles to meeting objectives of successful wind power deployment.

In sum, the empirically-based stakeholder network analysis in the cases of these two Indian states suggests a positive link between the RE utilisation rate and the embeddedness of stakeholders in certain structures and interactions. As an outcome of largely inductive research, this causal observation awaits further case study testing in order to hypothesise definite correlations.

### **Effectively governing renewable energy: impacts of stakeholder networks**

Wind energy governance takes place differently in Tamil Nadu and Kerala and is explained in part by the distinctive configurations and dynamics of stakeholder network. Stakeholder network analysis is the first step and facilitates the identification of how governance takes place by, with, and for whom in the case of wind energy deployment. This case presents a scenario where wind energy deployment is facilitated when stakeholder networks are constituted by actors characterised by high RE orientation, by actor arrangements with embedded relations and by structurally-open interactions. This is due to the facilitated communication processes and exchange of resources, favours and information in an atmosphere of mutual trust and common purpose between private and public stakeholders. In this following section, the second step is to compare the specific stakeholder networks with regard to respective state-market relations and to explore implications for the effects of networks on the adoption of new modes of governance.

Governance matters in as far as stakeholder networks exert certain effects on the governance of RE (Table 3). This means that the nature and the dynamics of state-market relations crucially determine the effectiveness of RE service delivery. The empirical examples of Tamil Nadu and Kerala show that the more intense state-market relations – in terms of embeddedness and quality of interactions between public and private stakeholders – the more supportive the general framework conditions and the smoother the implementation activities.

Table 3: Stakeholder network effects

	<b>Network Effects</b>	<b>Network Mechanisms</b>
Output (stakeholder activities)	<ul style="list-style-type: none"> <li>• Design framework conditions for wind deployment</li> <li>• Getting policy &amp; regulations right</li> <li>• Bringing the key stakeholder constituency on board</li> </ul>	<ul style="list-style-type: none"> <li>• Organisational routines established</li> <li>• Evolution of norms</li> <li>• Establishment of leadership</li> <li>• Creating access – move beyond formal interactions</li> </ul>
Outcome (stakeholder behaviour change)	<ul style="list-style-type: none"> <li>• Implementation of and compliance with policies &amp; regulations</li> <li>• Deployment of wind projects</li> </ul>	<ul style="list-style-type: none"> <li>• Engagement in public-private interactions</li> <li>• Manifestation of common goals and understandings</li> <li>• Exchange of assets</li> <li>• Manifestation of reputation and trust</li> </ul>
Impact (change in policy target)	<ul style="list-style-type: none"> <li>• Access to additional support mechanisms</li> <li>• Push for supportive policies &amp; attitudes</li> <li>• Extension of lobby activities</li> </ul>	<ul style="list-style-type: none"> <li>• Brokerage – technology diffusion</li> <li>• Norm entrepreneurship – policy and norm diffusion</li> </ul>

The spatial distribution of CDM activities reflects something close to the patterns of wind power deployment. Kerala does not harness wind power and also does not benefit from the participation in such new modes of governance. On the one hand, this appears counter-intuitive as new modes of governance are designed for the specific purpose to overcome implementation deadlocks and catalyse clean development activities. This apparent ambiguity can be understood in light of the nature of these new modes of governance and their interplay within the local setting. To start with, the CDM as a market-based policy instrument is governed through the mutual interaction of public and private actors with the objective to circumvent traditional hierarchal state-led approaches.

But what happens when new modes of governance are confronted with local settings defined by locally specific relations and interactions among actors? In the case of Kerala, stakeholder networks are characterised by relatively centralised, disembedded state-market relations that constrain the effective governance of wind energy. In this context, actors that are involved in the CDM experience difficulties accessing the necessary governance structures, actors and processes. For example, due to the lack of a single-window clearance system and the critical attitudes of the electricity utility, wind turbine manufacturers spend more time and resources to obtain clearances required for deployment activities. In contrast, governing RE in Tamil Nadu occurs through an interactive and embedded public-private actor network. This facilitates the integration of new modes of governance and new actors in the wind power sector.

The characteristics of and dynamics within RE stakeholder networks, in the end, are important explanatory factors for the extent to which technology transfer takes place and how policy/norms are diffused in local contexts. In this sense, wind power promoting effects such as facilitated clearance procedures emerging due to certain dynamics and characteristics of RE governance arrangements determine how CDM potentials are taken up in the specific local context. However, over time external stimuli such as the CDM play a role in opening windows of opportunity to instil an awareness of, or interest in, wind energy deployment. This means that stakeholder networks are not

the only enabling condition required for effective RE governance, but might also develop as the consequence of new modes of governance encountering local realities. The final and concluding implication is that for external stimuli like the CDM to exert effects in local contexts, supportive state-market relations are required for enabling access to the RE stakeholder network.

### **Conclusions: Governance prerequisites and implications**

Tackling the difficult choices between development and climate change objectives through, for example, the deployment of alternative energy sources has several implications for existing local stakeholder networks. Social science debates propose that understanding changing state-market relations requires a different approach to explain how governance takes place in this context. This paper argues the case for stakeholder network analysis as an analytical and conceptual device to grasp governance in terms of state-market relations and interactions, i.e. to elucidate by whom, for whom, how and with what means governance takes place outside the OECD world. Stakeholder network analysis points towards the significance of state-market relations, characteristics and interactions in evolving networks for the effectiveness of RE deployment.

The key results of stakeholder network analysis suggest that effective governance that leads to the deployment of wind energy projects takes place when RE networks are constituted of and characterised by:

- i. Highly-favourable attributes of actors participating in RE deployment;
- ii. Actor arrangements embedded in a dyadic relation characterised by high social capital, reciprocity and low formalism in structurally open interactions;
- iii. A market environment in which the exploitation of new opportunities in emerging sectors such as wind energy is facilitated.

In light of the governance framework, these findings imply that even though questions of who is governed by who appear straightforward at first sight, qualitative differences emerge when specific characteristics and attributes are considered. This has implications for how governance takes place and the means employed in interactions. Governance processes and mechanisms are understood in terms of the relations and interactions between stakeholders embedded in multilevel networks. This allows for going beyond the state-market and public-private divide and addresses the ambiguities between providers and recipients of RE services. This paper has made the case for stakeholder network analysis to grasp state-market relations and their impacts on RE governance. Furthermore, it allows for consideration of new modes of governance in interactions with local realities, with implications for the legitimacy and effectiveness of RE governance.

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