
CHAPTER 3

# India's Renewables Commitments: A Political Risk Assessment

*Diptiranjan Mahapatra, Sumita Sindhi, and Avilasha Tripathy*

## 3.1 Introduction

The world has been witnessing the changing nature of political risk since the age of coal and steam in the eighteenth and nineteenth centuries and subsequent emergence of petroleum from the end of the nineteenth to the early twenty-first centuries. Consequently, the field of political risk

D. Mahapatra (✉)
Faculty, Public Policy and Business Strategy, Indian Institute of Management Sambalpur, Sambalpur, Odisha, India
e-mail: diptiranjanm@iimsambalpur.ac.in

S. Sindhi
Faculty, Sustainability, CSR and Ethics, Indian Institute of Management Sambalpur, Sambalpur, Odisha, India
e-mail: sumitas@iimsambalpur.ac.in

A. Tripathy
Indian Institute of Management Sambalpur, Sambalpur, Odisha, India
e-mail: phd19avilashat@iimsambalpur.ac.in



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surrounding energy has evolved substantially in the past hundred years, albeit with an overt and unwavering disposition towards oil and gas. As the world was settling down with the political risk narrative synonymous with the geopolitics of oil and gas, shale discoveries in the USA and the prolific push for renewables combined with the twenty-first century political risk view that involves non-state actors in international relations (Rice and Zegart 2018) have reconfigured the conversations surrounding energy political risk. India is in the midst of this very interesting transformation. While its import dependency on conventional energy continues unabated, it is investing heavily in renewable energy with a goal of installing 175 gigawatts (GW) of renewable capacity by 2022 to support its submission towards Intended Nationally Determined Contribution (INDC). Embedded in this is a profound manoeuvring that India has to manage: on the one hand, the changing nature of conventional energy supplier countries and their accompanying leverage needs to be internalized. On the other hand, because of intrinsic nature of factor inputs i.e. land, and output i.e. electricity from renewable being state subjects (though electricity is a concurrent subject in India but mostly driven by states), states within India now exercise more leverage than the centre for renewable energy projects. The political-economy surrounding the spirit of collaborative and cooperative federalism, whereby various central and state entities in the Indian electricity sector can work on common narratives is going to be focal to understanding the geopolitics of renewable energy from an Indian perspective.

We find that while there exist vibrant academic debates on political risk of conventional energy, scant attention has been given to the political risk of renewable energy (Overland 2019); predominant focus so far has been on the conflict potential of rare earth materials in international energy dependencies (as cited in Scholten and Bosman 2016). Consequently, the literature is significantly silent when it comes to explicating if and how centre-state political risk within a country can sustain the renewable energy growth. A common framework with which to explore the issue is lacking and wanting. While we propose an extension of the current typology surrounding the conventional energy geopolitics and how it relates to the renewable energy, the main thrust of this chapter however will be to propose a framework that can help understand the relationship between centre-state surrounding energy political risk in the Indian context. Our model posits that the idiosyncratic centre-state India specific conditions entailing socio-cultural and political-institutional environments strongly

influence the renewable energy political risk. This is in contrast to the nuanced political risk focus on positions of countries in the international system of dependency on critical raw materials and technologies that may follow from the rise of renewables. Our work definitely is not fully representative of renewable political risk faced by all countries in all situations and hence, should certainly not be seen as the generalizable work on the subject. Quite the contrary, it invokes a first inroad to a new theme, one that refurbishes an already existing phenomenon and acts as a food for thought for future works.

The remainder of this chapter presents a literature review that maps the field of the political risk of conventional energy and the changing nature of it as applied to renewables. Combining insights from international relations with external-geopolitics perspective on the one hand and renewable energy as seen from political-economy of centre-state relationship (internal-geopolitics perspective) on the other, it seeks to clarify key concepts and their relation. It then constructs an analytical framework that revolves the transition. Finally, the conclusion summarizes the core arguments we have been able to make shaping the geopolitics of renewables.

## 3.2 Literature Review

Historically, energy issues have been closely related to regional and global geopolitics (Akiner 2004; Amineh and Guang 2012; Andrews-Speed 2008; Correlje and van der Linde 2006; Friedman 2006; Eisen 2011) as traditional energy sources such as oil, natural gas and coal are strategically significant spatial variables (Francés et al. 2013; Scholtena and Bosman 2016; Sovacool 2011). According to Keppler (2007), the global energy policy and the relationship existing between suppliers, customers and the transit countries are important factors influencing international relations. As observed by Paltsev (2016), the power balance is now shifting away from the countries rich in fossil-fuel to countries who are efficient in developing sources of low-carbon energy. For countries heavily dependent on oil imports, the alternative technologies like solar and wind power will lead to diversification and improved energy security and as a consequence reduce the power yielded by the traditional energy producers (Larson 2007; Scholten and Bosman 2016; Criekemans 2011, 2018). However, renewable energy geopolitics is a very complex issue with many distributed players (Paltsev 2016) with varied dependence on multiple inputs like

access to rare earth elements, patents, storage, and technology (Scholten and Bosman 2016).

Scholten and Bosman (2016) has important observations on the shift in emphasis from getting access to the resources as in the case of fossil energy geopolitics, to management of strategic infrastructure as in renewable energy geopolitics. Since renewables are most easily converted into electricity, electricity is expected to become the prevalent energy carrier in a renewable energy-powered world with significant consequences (Ellabban et al. 2014). The renewable energy electricity grid would be a physically interconnected system that links consumer and producer countries via a single integrated grid (Battaglini et al. 2009). As with fossil fuels where transit countries have a vital role to play, renewable energy would also have power in the hands of those who manage major power lines (Paltsev 2016) and endowed with rare earth elements often known as critical components of equipment for renewable energy (De Ridder 2013; Golev et al. 2014; Hurd et al. 2012). Since almost all mining, production and processing of rare earths is done in China today (Dutta et al. 2016; Wübbeke 2013), this overwhelming dependence on China as the dominant supplier of rare earths materials could potentially lead to geopolitical tensions and cartelization (O'Sullivan et al. 2017). Interestingly, provisions such as small renewable energy producers returning electricity to the grid could possibly shift the power balance among citizens, local authorities and national governments (Schleicher-Tappeser 2012).

Despite the egalitarian narrative underlying the argument that each nation has access to at least one or another type of renewable energy such as sun, hydro, wind and geothermal energy, neither the opportunity nor the potential for generating energy is the same for all renewable energy sources (Sathaye et al. 2011). As a consequence, solar and wind energy costs would be significantly differing from region to region thus potentially creating a situation similar to the world dominated by fossil fuels (Palmer and Burtraw 2005). Similarly, Overland (2019) tries to invalidate four emerging concerns i.e. competition over critical materials; resource curse; transboundary electricity cut-offs; and cyber-security risks.

## 3.3 India's Renewable Energy Sector

Renewable energy push has started taking the centre stage in India's pursue towards not just the low carbon development path but also towards providing energy access, reducing consumption of fossil fuels, and

augmenting grid power. As per Global Status Report-2018 of Renewable Energy Policy Network for the 21st Century, India ranked 5th in Renewable Power Capacity (including hydropower) and 4th (not including hydropower), as of end 2017. India's ambitious submission of Intended Nationally Determined Contribution (INDC) to the UNFCCC is contingent upon installation of 175 gigawatts (GW) of renewable power capacity which includes 100 GW from solar, 60 GW from wind, 10 GW from Biomass and 5 GW from Small Hydro power by 2022. Over the years, India's steadfastness towards renewable sector has paid off by successfully creating a positive outlook necessary to promote both investment and demand.

In India, a total of 80.04 GW of renewable energy capacity has been installed in the country till May 2019. The state-wise and source-wise details of the power generated through renewable energy sources in the country during each of the last three years are given in Annexure I.

The strategy adopted by the government for achieving renewable energy target includes the following:-

1. Waiver of Inter State Transmission System (ISTS) charges and losses for inter-state sale of solar and wind power for projects to be commissioned up to March, 2022.
2. Permitting Foreign Direct Investment (FDI) up to 100 percent under the automatic route.
3. Notification of standard bidding guidelines to enable distribution licensee to procure solar and wind power at competitive rates in cost effective manner.
4. Declaration of trajectory for Renewable Purchase Obligation (RPO) up to the year 2022.
5. Viability Gap Funding (VGF) and permitting Foreign Direct Investment up to 100 per cent under the automatic route
6. Implementation of Green Energy Corridor project to facilitate grid integration of large-scale renewable energy capacity addition.
7. Notification of standards for deployment of solar photovoltaic systems/devices
8. Launch of new scheme for farmers, Central Public Sector Undertaking (CPSU) Phase II and Solar Rooftop Phase II program.
9. The government has requested the Reserve Bank of India to consider segregating the exposure in Renewable Energy (RE) sector

from Power Sector and defining new category 'RE sector' so that flow of capital for RE sector is not hampered.

The National Solar Mission (NSM), launched in January 2010, was the first mission to be operationalized under the National Action Plan on Climate Change (NAPCC). Through a range of policy instruments and mandates such as building by-laws and its incorporation in the National Building Code, the initial target of the mission of installing 20 GW grid-connected solar power plants by the year 2022 was enhanced to 100 GW to be achieved by the same target year. However, major areas of concern remaining are strengthening of the planned infrastructure, protocols and power grid infrastructure for evacuation of renewable energy.

The International Solar Alliance (ISA) was launched in 2015 as a treaty-based alliance between countries that are Members of the United Nations, and aims at accelerating development and deployment of solar energy globally. In 2017, the ISA became a treaty based international intergovernmental organization in which 75 prospective Member countries have signed the Framework Agreement of the ISA and 54 of these countries have ratified the same.

Against the estimated wind potential of the country (see Annexure) is around 302GW at 100m above ground level, capacity installed as of 2018 is 35.01GW. To facilitate the development of wind power projects in an efficient, cost effective and environmentally benign manner, the government has issued a detailed 'Guidelines for Development of Onshore Wind Power Projects' that prescribes the requirement of site feasibility, type and quality certified wind turbines, micro-siting criteria, compliance of grid regulations, real time monitoring, online registry and performance reporting, health and safety provisions, decommissioning plan, etc. However, the key challenges in harnessing wind energy are availability of land, logistics in transporting turbine blades and power evacuation infrastructure at potential wind sites.

Most of renewable energy projects in the country are being set up by the private sector developers selected through transparent bidding process. The government has issued standard bidding guidelines to enable the distribution licensees to procure power at competitive rates in cost effective manner. In order to protect the interest of small developers, states and union territories can procure power from solar projects (less than 5 MW capacity) and wind projects (less than 25 MW capacity) bypassing competitive bidding guidelines through Feed-in-Tariff (FiT) mechanism as

determined by the respective State Electricity Regulatory Commission (SERC).

## 3.4 A Framework of Analysis

In this section, our interest lies in unpacking political risk, broadly defined as the impact of politics on markets (Bremmer 2005), in the context of renewable energy in India. In order to have a granular understanding of it, we disentangle political risk to two things: first, risk associated with geopolitics – a term that is associated with the political geography and international relations (Scholten 2018), which we label as external-geopolitics perspective (Criekemans 2018); and second, risk embedded with the political economy, a term broadly indicates how political forces within a country or a state interact with institutions that eventually influences functioning of market (Victor and Heller 2007), which we label in this study as internal-geopolitics perspective (Criekemans 2018). Going forward, we take the perspective that the study of the geopolitics of renewables has at its core the strategic realities and policy considerations of producer and consumer countries investing in renewable energy. Sources and technology may become the dominant geopolitical players or victims of cooperation and conflict. Similarly, the study of the political economy of renewables is at its very essence about empowerment of region or states because of decentralisation of the energy generation impacts, centre-state relationship and eventually the political economic fabric within a country, India in this case.

We operationalize the two core concepts i.e. external-geopolitics (Fig. 3.1) and internal-geopolitics by further breaking it down into distinguishable and actionable pieces to aid the understanding of the relationship between renewables and political risk and make it as a toolkit to readers (see Annex I and II). Before delving deeper into the subject, it is beneficial to contextualize the understanding of these two core concepts as applied to India. Since external-geopolitics and internal-geopolitics are generally associated with fossil fuels, especially oil, coal and natural gas because of their dominance in the global energy mix it is natural to start the discussion by delineating the changing nature of the concepts as applied to conventional as well as renewable energy. A simple representation as depicted in the below continuum would help simplify the ideas.

Based on our understanding, conventional and renewable energy may be depicted on a spectrum that represents one possible combination of

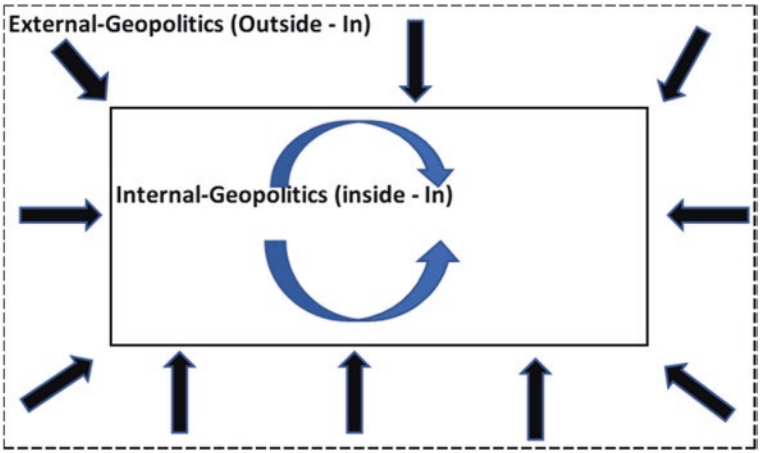


**Fig. 3.1** External and Internal Geopolitics. (Source: Author's description)

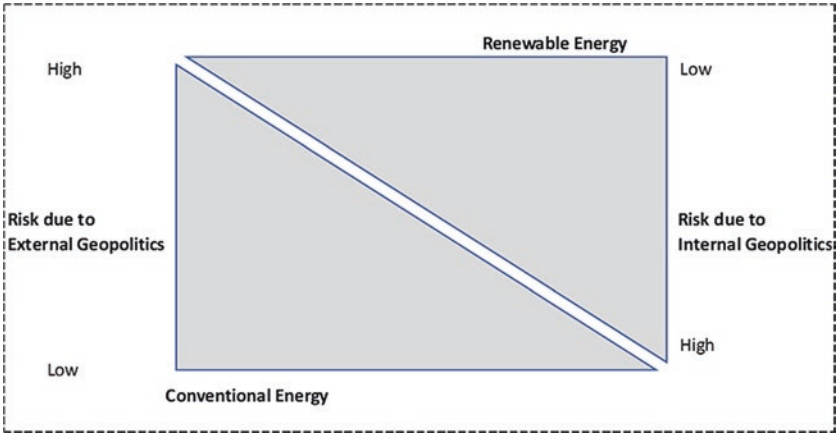


**Fig. 3.2** External and Internal Geopolitics: Energy Type versus Risks. (Source: Author's description)

external-geopolitics and internal-geopolitics involvement in conventional and renewable energy delivery, classified according to the risk allocation between them (see Fig. 3.2 below). Except for the nation-state and authoritarian case where the same government is responsible for the interactions and execution of contracts outside as well as inside, all other

case would involve multiple levels of interactions by federal or central, and provincial or regional or state governments while finalizing and operationalising the contract. In India, since conventional energy resources such as oil, gas, and coal are central subject, most of the risk associated with it are linked to central government's relation with outside world. But when it comes to renewables, the division of interaction and subsequent emergence risk is explicit. As electricity is the energy carrier and the final product of most renewables—as opposed to physical commodity in case of conventional—local and regional governments exercise more levers vis-à-vis their central counterparts because state-controlled electricity distribution companies (discoms) are the ultimate off-taker of electricity. Further, the critical factor inputs for renewable project i.e. land is a state subject in India. Consequently, this combination of state dominance over renewable projects changes the geopolitical power relations between the central and state government in future geopolitics.

Next, to understand how the rise of renewables is transforming energy-geopolitics landscape, we are tempted to examine key shifts associated with the move from conventional energy to renewable energy (Table 3.1).

By introducing this analytical framework above, we have laid the groundwork for a comprehensive overview of the great transition. As evident from the above table, the coming energy transition towards renewable energy will engender far-reaching consequences though the jury is still out on how fundamental this change will be especially with regards to centre-state relationship—the core focus of the next section. Though we do not strive to be exhaustive in our endeavour to present the centre-state debate next, but rather aim to showcase the key triggers in which renewables are reshaping political economy of centre-state relationship and old-new government within a state.

### *3.4.1 State Versus Centre Debate I (Internal Geopolitics)*

India has become one of the top renewable producers with a target of 175 GW of installed capacity for which it would require investment of around $80 billion till 2022. Unfortunately, concerns about India's ability to reach that milestone now being raised when a spate of issues related to delays in payments by state-run distribution companies (DISCOMS), and Andhra Pradesh and Uttar Pradesh's decision to renegotiate tariffs of solar and wind projects have surfaced. As of July 2019, distribution companies (Table 3.2)- long been under financial strain—across India owed

**Table 3.1** Examining Geopolitical Shifts: Conventional and Non-conventional Energy

| *Conventional energy* | → | *Renewable energy* |
|---|---|---|
| Resources finite, depleting, and geographically concentrated | | Resources abundant, replenishable, evenly spread, and intermittent |
| Business models dominated by economies of scale: high capacity, centralized facilities | | Increasingly decentralized nature of energy production by and for a more varied set of local actors |
| Oligopolistic markets where producers such as Russia and the OPEC countries hold considerable market power | | Increasingly becoming competitive markets |
| Energy geopolitics generally revolve around depleting and geographically concentrated oil and gas reserves in politically unstable countries in the Middle East and North-Africa (MENA) and Central Asia and Caspian Region (CACR). | | Energy geopolitics to centre around competition for rare earth materials and clean tech know-how between countries like US, Germany, and China that aspire to become industrial leaders |
| Clear demarcation between net-exporters and net-importers | | Countries essentially face a make-or-buy decision (security versus affordability) |
| Commoditization of energy systems, as commodity like coal, oil and gas physically move around | | Electrification of energy systems, as electricity is the energy carrier |
| Concerns revolve around import-dependence, climate change, and transport bottlenecks, continuity of commodity supply | | Concerns over supergrids, system integration, spot emergency response to prevent blackouts, continuity of service supply, strict managerial oversight for grid management |
| Price volatility due to political instability or supply disruptions | | Price volatility because of intermittency |
| Globalization of environmental impacts | | Localization of environmental impacts and land related issues spiralling into food versus fuel, and community land debates |
| Individual country engages in oil or gas diplomacy | | Possibility of individual region or states initiating energy diplomacy like California in the USA |
| Militarization of energy strategy | | Limited chances of future use of electricity as a 'weapon' in a world where resources are expected to be spread evenly |

(*continued*)

**Table 3.1** (continued)

| *Conventional energy* | ➡ | *Renewable energy* |
|---|---|---|
| Primary focus on resource control or endowment; internal optimization; supplier -receiver relationship; | | May be visualised as a platform ecosystem where the primary focus would be resource synchronization; external interaction; ecosystem relationship |
| Producer and consumer countries usually remain fixed | | Consumers and producers can swap roles, for example through net metering |
| High entry barriers because of huge upfront investment | | Works like an open architecture as long as consumer has a place to install a solar or wind panel/equipment |

Source: Authors own interpretations from Criekemans (2018), Scholten (2018), Van Alstyne et al. (2016)

**Table 3.2** Power Utility Ownership by Companies and States

| *State/Utility* | *Sum of Amount (in Crore)* |
|---|---|
| Andhra Pradesh | 2509.21 |
| Tamil Nadu | 2413.47 |
| Telangana | 1580.84 |
| Karnataka | 937.75 |
| Madhya Pradesh | 832.65 |
| Rajasthan | 722.23 |
| Maharashtra | 629.40 |
| IREDA | 22.42 |
| Punjab | 19.80 |
| DPL | 19.03 |
| Gujarat | 18.16 |
| Uttar Pradesh | 11.74 |
| Bihar | 8.13 |
| Sikkim | 6.36 |
| Uttarakhand | 3.37 |
| Andaman Nicobar | 0.75 |
| Torrent Power | 0.31 |
| **Grand Total** | **9735.6** |

Source: CEA (2019)

renewable power producers INR 9,736 crore (refer table below) of which around three-quarters of that were owed by four southern states—Andhra Pradesh, Tamil Nadu, Telangana and Karnataka.

Interestingly, the state of Andhra Pradesh that owes over a quarter of the combined dues of all DISCOMS has been trying to renegotiate Power Purchase Agreements (PPAs) raising investors' concerns about the sanctity of PPAs. While the renewable energy companies approached the Andhra Pradesh High Court against the state government intention to revise the PPA, the court directed the power producers to go to the state electricity regulatory commission. Subsequent to this event, the state of Uttar Pradesh government stopped procuring electricity from 650 MW of wind power plants. While the states may have appealing reason to do this as fierce competition in solar and wind power auctions in recent times along with falling prices of equipment have helped tariffs tumble to record lows, making older projects look very costly. However, when facing request for renegotiation of contracts competitively won, the sanctity of the bid must be upheld. State's misdemeanour like this might make investors wary and inactive. Given that all renewable generation is a must-dispatch scenario as per the law, any political interference will only lead to depletion of the confidence of investors jeopardizing the overall business sentiment of the country.

### *3.4.2 State Versus Centre Debate II*

Post Paris negotiations, Indian government's focus on renewable energy (RE) implementation for climate change mitigation has been proposed and this message has been conveyed to all Indian states (Dubash and Jogesh 2014). States comply with targets mandated under NAPCC and set up incremental targets. The initial thought of RE as a tool to reduce energy deficits, decrease electricity imports and provide quality energy services to underserved is lost. This can be attributed to lack of institutions, barriers to high priced renewables, challenges with grid integration and lack of suitable interstate power off-take mechanisms.

The Karnataka Renewable Energy Development Ltd. (KREDL) as the state nodal agency has been allocated 67% (19,772 MW) of the state's RE potential, but only 17% (4887 MW) has been commissioned (KREDL 2016). Struggle lies in getting permits and clearances – the process is tedious and time taking. The other hurdle is land-use uncertainty. RE targets are not integrated with land-use planning at district level and the

growth/failure depends on land acquisition for individual projects. Renewable energy infrastructure and technology cannot expand in silos. It needs to be integrated with states development agenda and inter-related factors as land use, rural development and environmental sustainability.

Karnataka has a good solar and wind resource, but the solar developers are cautious in setting up plants in northern Karnataka, envisaging grid evacuation challenges as in Tamil Nadu (Sushma 2014). State bears the cost of infrastructure and although open access regime and FiT is attractive for states, but the costs are more than the profits. Customers do not want to bear the brunt of these charges (Ramamurthi 2016). Therefore, Central government intervention can help state governments take full advantage of their RE resources.

The problem rests in dearth of institutional mechanisms that can integrate RE investment with conventional power sector planning. Due to this, severe electricity deficit states are unable to utilize RE resources to meet their needs (Ramamurthi 2016). Need of the hour is to build on integrative institutional mechanisms with clean energy financial support to the states.

Central schemes are inadequate to cover the subnational electrification. The commitment by central government at international arenas, can only be implemented if the conventional energy route is withdrawn and local context specific action road maps for RE are redrawn. A paradigm shift in financial and technical models are a requisite for adoption of RE technologies, to which central support is paramount. India's high renewable targets are a step in the right direction. However, how well India will fare eventually boils down to the extent to which central and state actors' priorities and institutional mechanisms are aligned.

## 3.5 Discussion

India has taken a stand on energy system transformation and its renewable policy is an inspiring example for many countries around the world. Data shows that India is all set to cross the 100GW renewable energy capacity mark in 2020. Provided the government deals with some of the key issues, India will rapidly stride towards the ambitious 175 GW renewable energy target by 2022.

The key issues afflicting renewable energy generation, distribution and storage are categorized in this chapter into institutional, structural, financial and regulatory for better comprehension. Moreover, these issues also

highlight the rift between centre and state political economy with respect to renewable energy dynamics. Though these categories are not water-tight, and issues overlap, nevertheless it brings clarity in the role of various actors and a scope to cater to policy uncertainty.

The key challenges in energy system transformation are:

### *3.5.1 Institutional Challenges*

The institutional structure for renewable energy development in India clearly shows a division between centre and state level institutions (Fig. 3.3). A common reform roadmap is required among a broad range of central government agencies, state authorities, system operators and utilities.

On the left side of renewable energy development arrow are the policy makers on a national level and on the right side are the implementers/producers and regulators of renewable energy at state level.

As per various reports, the distribution companies or discoms in most of the states are under performing. The reason for that is the financial stress discoms are undergoing due to high capital cost for renewable

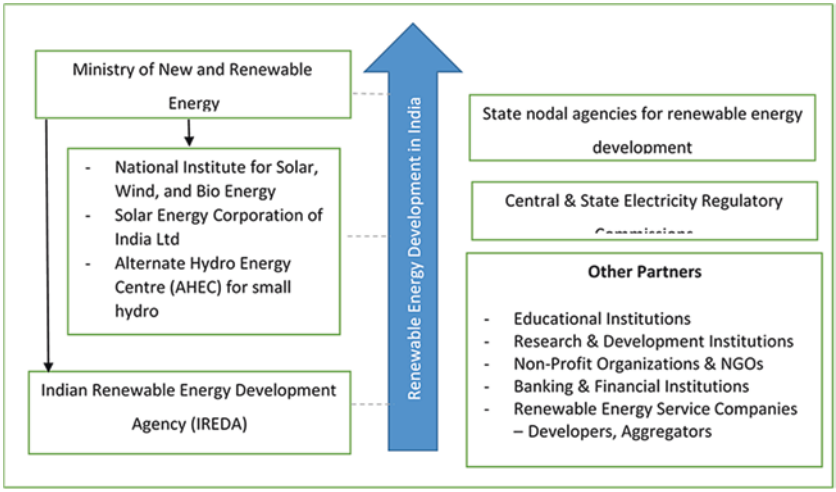


**Fig. 3.3** Institutional Structure of Renewable Energy Development (Source: Author's description)

energy and prevailing policy uncertainties. The RPO regime on the one hand stimulates renewable energy investment but has proven to be a cause of failure of discoms because of lack of harmonization between national and state level targets.

There is a need to evolve the age-old discom model by changing from a centralized model to a more distributed system (e.g. roof top solar model for energy generation). Most of the schemes are tied to extending the grid and connecting un-electrified households to centralized distribution and transmission networks. Managing this centralized system has become unworkable.

The SPDA listed issues impacting the segment which includes uncertainty over GST rates for SPGS (solar power generating systems), forecasting and scheduling mechanism, continued safeguard duty on imported solar cell/modules, provisional anti-dumping duty on import of material for module mounting structures, grid curtailment etc.

### *3.5.2 Structural Challenges*

Structural level changes require cost, which leads to increase in cost of renewable energy projects and hence the expansion of the projects is difficult. The characteristics of renewable energy make it variable and affect the degree of its predictability. So the requirement is to integrate renewables into the grid by taking measures like renewable energy generation forecasting, coordinated project development, grid planning and grid strengthening; thereby reducing the variability and uncertainty of RE generation through aggregation over broader geographic regions, creating flexible capacity, spinning reserves and ancillary services market, and properly defining RE grid integration standards and regulations. Development of storage systems is necessary in order to ensure uninterrupted power supply using RE sources like solar and wind.

### *3.5.3 Financial Challenges*

Lack of interest of financial institution to fund renewable energy projects is perceptibly a risk averse move. So, a high cost and low availability of debt have increased the cost of such projects and hence creates hurdles in expansion of renewable sector. Most of the discoms are not in a good financial health. Weak financials of discoms will keep them from meeting

commitments and affects the effectiveness of instruments that have been put in place for deployment of renewables.

Safeguard duty on imported solar panels, ambiguity over GST on solar equipment are some of the hurdles in clearly defining the financials for the project. Payment delays for developers, cancellation of auction and lack of enforcement of contracts dampens the investor confidence and developer's interest. Need of the hour is to institutionalize Renewable energy and streamline it with the existing grids.

### *3.5.4 Regulatory Challenges*

A robust regulatory framework is required. The state discoms will have to start taking RPOs seriously and state regulatory authorities will have to hold the discoms responsible and penalize them for failing to comply on purchase obligations. Recently the Electricity Regulatory Commission of Uttarakhand imposed a penalty on its discom for not complying with its renewable power obligation (RPO) target. Instead, the states are allowing the obligated entities as Discoms and captive consumers to 'carry forward' deficits to the next financial year.

Another regulatory challenge is to streamline, accelerate, and standardize the acquisition of permits, clearances and other administrative hurdles that the developer must cross. These relate particularly to land acquisition and environmental permitting. Lack of coordination among key organizations like revenue department, state pollution control board, grid operators has led to time and cost overruns resulting in high transaction costs.

## 3.6 Conclusion

This chapter strives to achieve three main goals that we believe would contribute to an enriching understanding of the political risk surrounding renewable energy. The first objective has been to briefly discuss the extant narratives on the political risk. We observe that current framework provides plausible explanations of how countries (both importer as well as exporter) are able to reconcile their external-geopolitics, albeit from a conventional energy perspective. However, they are of little help in explaining how countries are able to sustain the internal-geopolitics, especially with respect to renewable energy. This is particularly troublesome when the success of impetus to renewable energy of any country in general and India in particular, is not based on privileged control of critical

resources and technologies but on managing the centre (federal)-state (region or province) equation within the country.

We address the second objective i.e. to provide explanations to flesh out the conventional to renewable transition and what it means for political risk—by proposing a framework that delineates how geopolitical world of renewable energy is different or similar compared to the geopolitics of conventional energy. We think the applicability of this framework would help rekindle interests and as a consequence, the dearth of research on this topic could be a thing of the past.

Our third objective was to provide evidence to support the importance of internal-geopolitics i.e. political economy of centre- state in Indian context. By providing factual story of recent events, we make an attempt to drive the point that how renewable energy is aiding the changing power relation, with states in India disposing of more levers vis-à-vis centre, ostensibly towards creating an egalitarian economic landscape.

## Annexes

### *Annex I*

| *External-Geopolitics (Outside – In) – possible manifestations* | *Example* |
|---|---|
| Resource Nationalism and expropriations | In Venezuela, resource nationalism was an important feature of the 'Bolivarian Revolution' under the Chávez presidency. As per Maplecroft Resource Nationalism Index (RNI), countries now rated 'extreme risk' include: Venezuela and the Democratic Republic of Congo; Tanzania; Russia; North Korea and Zimbabwe; Swaziland; Papua New Guinea |
| Host government reneging on contracts with a focus on shifting a larger share of commodity revenues from international to domestic hands thereby increasing the host government's fiscal take | Kazakhstan in the super-giant Kashagan project; Mongolia in Oyu Tolgoi copper project; Chile's state-owned Codelco versus Anglo America; Repsol in Argentina; Gazprom in Sakhalin-II |
| Great power shifts | Russia's annexation of Crimea, the invasion of eastern Ukraine and the shooting down of a passenger airliner; Brexit; decline of US intervention in global order |

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| *External-Geopolitics (Outside – In) – possible manifestations* | *Example* |
|---|---|
| Increase in south-south trade | Chinese commercial clout over Africa; flow of commerce among emerging countries bypassing the West as intermediary |
| Interstate wars (including proxy wars) | Physical as well as cyber and data wars |
| Multilateral economic and trade sanctions | USA and EU sanctions on Russia, Iran; U.S.-China trade war |
| Opening up of new sea routes debottlenecking strategic maritime passages chokepoints | Panama Canal Expansion; Northern Sear Route (NSR) connecting Northwest Europe with Northeast Asia via the Arctic Ocean |

Source: Authors own interpretations from Rice and Zegart (2018)

## *Annex II*

| *Internal-Geopolitics (Inside – In) – possible manifestations (India Specific)* | *Example* |
|---|---|
| Individual Province/region/ State's control over factor input like land, labour, capital, and infrastructure | Renewable energy projects leading to significant land-use change rendering lands now used for occupational purpose, Ecological importance and cultural significance being labelled as wastelands. |
| Centre-state relationship (federal cooperatism) | State-wise Central assistance; FDI equity flows into various states; Conventional (Oil/gas/coal) energy contracts-Centrally controlled versus Renewables (Electricity)—State controlled through PPAs |
| Host provincial/state government reneging on electricity contracts (Power purchase/sales agreement) | Electoral cycles driving renegotiation of PPA contract as the new government often seek to reinforce their support by exploiting the populist appeal, a phenomenon recently observed in many states |

Source: Authors own interpretations

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