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Impact of 18th Constitutional Amendment on Governance of Renewable Energy in Pakistan

HEINRICH BÖLL STIFTUNG PAKISTAN

WWEA
World Wind Energy Association

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The views and analysis in this publication are those of the author and do not necessarily represent the opinions of WWEA and hbs.

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Preface by the World Wind Energy Association

The global shift towards renewable energy, one imperative outcome of the Paris Agreement on Climate Change but also an indirect consequence of the Sustainable Development Goals and other international objectives, seems to represent a huge challenge for decision makers in governments but also in the business sector.

As this energy transformation goes hand in hand with great benefits for countries, regions and communities around the world, it has to be well managed by the responsible authorities. While the main decision making authorities in particular of international agreements are usually national governments, implementation touches often or is under the responsibility of sub-national units, be it states, provinces, or local governments.

Pakistan is also among the countries which have given more decision-making power to its sub-national level. This can in general be very useful to accelerate the deployment of renewable energy, as these technologies are usually applied on a more decentralised level. It means that decisions should be taken where citizens are mostly affected by them and where local conditions are better known than in a national capital.

However, energy policy is not a stand-alone area, but it is connected to many other fields, e.g. spatial planning, taxation, etc. Hence it must be ensured that such cross-cutting areas are not representing barriers for a smooth application of regional or local renewable energy policies.

A smooth and decentralised decision making which takes place close to citizens and communities has the potential of speeding up not only the switch to renewables, but to foster general economic growth and prosperity, if it is done in the right and well-coordinated way.

We hope that our research and recommendations for the case of Pakistan will help the government of Pakistan, of its provinces and also the renewable energy sector to come closer to such harmonised and efficient structures. Pakistan, its provinces, cities, villages, communities and all its citizens have a lot to gain from such smooth system.

Due to its general character, the analysis and also the conclusions are certainly not only valid for Pakistan but for many other countries which aim at improving their governance systems and fostering the switch to renewable energy.

Stefan Gsänger

Secretary General
World Wind Energy Association

Preface by Heinrich Böll Stiftung

The fact that the burning of fossil fuels is the largest source of carbon dioxide emissions, causing global warming is nothing new. The impacts of climate change are being experienced in all human and ecological systems around the world. It is internationally agreed that global warming needs to be kept below 2 degrees, in order to keep this planet liveable for all its inhabitants. This goal is only possible, if countries worldwide transit from burning fossil fuels to clean, renewable energy solutions.

But investment in renewable energies should not only be seen from the perspective of climate change and mitigation. Countries in the global South often seem to make the argument "to have a right to pollution" as their contribution to the climate crisis is minimal. In order to spur economic growth, create jobs and develop markets, they need energy – which is most economic by burning coal, oil or gas. But this argument is not completely valid anymore. Recent studies show that renewable energies are not only cleaner than fossil fuels, but cost competitive as well. A new report by the World Economic Forum states that Solar and Wind are now either the same price or cheaper than new fossil fuel capacity in more than 30 countries. Consequently, the share of renewable energy in the global power mix is growing fast. Even oil-rich Saudi Arabia is setting the course for the development of its solar potential.

Pakistan however, which has favourable natural conditions for renewable energy development, is far from tapping its potential and deployment of renewables is slow as compared to global trends. It is not only infrastructure, but operational capacities, efficient governance structures and policies, which need to be developed. This requires analysis and direction at every step. The Heinrich Böll Stiftung Pakistan has supported research amongst experts as well as awareness raising on sustainable renewable options since many years.

In 2013 hbs entered into a partnership with World Wind Energy Association focussing on wind power development in Pakistan. The publication series, two dedicated international conferences and three policy papers based on country wide surveys looked at the issues at stake and the ways to overcome barriers in the wind power sector of Pakistan. At that time the issue of favourable framework conditions, in form of policy and regulation as well as clarity on coordination amongst different government agencies was already identified.

Against this backdrop it was a logical step to widen the specific focus from wind power to renewable energy at large and specifically the governance side of it. The 18th constitutional amendment which shifted responsibilities from the centre and empowered the provinces, was not entirely implemented and left confusion in the energy sector at large. A review of governance mechanisms at both levels of government seems to be necessary.

With the right institutional framework conditions, renewable energy deployment can be a great chance for Pakistan to reach its development goals. Numerous examples worldwide show the importance of favourable legislation and policies towards a transition to clean and sustainable development.

hbs Pakistan is therefore delighted to be able to support this continuous effort of WWEA as contribution to a better understanding about the importance of renewable energy solutions among decision makers and civil society in Pakistan. While the focus still remains on large infrastructure and renewables make a small proportion in Pakistan's energy mix, we hope that his publication will promote discussions about alternative energy sources and its benefits for Pakistan's development strategy.

Jacqueline Wilk

Acting Country Director
Heinrich Böll Stiftung Pakistan

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ADB	Asian Development Bank
AEDB	Alternative Energy Development Board
CPEC	China Pakistan Economic Corridor
CPPA	Central Power Purchasing Agency
DISCOs	Distribution Companies
FIT	Feed-in-Tariff
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GoP	Government of Pakistan
IRENA	International Renewable Energy Agency
kV	Kilovolt
LNG	Liquefied Natural Gas
LOI	Letter of Intent
MoE	Ministry of Energy
MoWP	Ministry of Water and Power
MW	Mega Watt
NEPRA	National Electric Power Regulatory Authority
NTDC	National Transmission and De spatch Company
PCRET	Pakistan Council for Renewable Energy Technologies
PEPCO	Pakistan Electric Power Company
PPIB	Private Power Infrastructure Board
PV	Photo Voltaic
RE	Renewable Energy
RETs	Renewable Energy Technologies
STDC	Sindh Transmission and Dispatch Company

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Executive Summary

The role of energy in human and sustainable development is unprecedented. Although the proportion of the population having access to electricity has increased in recent years, about 1.06 billion people in the world still lack access to modern electricity services. The world energy system is primarily established on fossil fuel which results in environmental degradation and global warming. Global energy demand is increasing. Meeting growing demand and achieving universal electricity access without compromising on climate change risks require significant action. Renewable energy (RE) resources are being harnessed the world over to achieve the dual aim of electricity access and climate change mitigation.

Contrary to the global trends, Pakistan has been unable to catch up the momentum set by different countries in the transition towards RE supplies despite having favourable conditions for renewable energy technologies' development. A staggering 27% of the population still lacks electricity access in the country and those who are connected to the national grid, experience frequent blackouts. Renewables account for only 1,558 MW out of the total power installed capacity of 25,000 MW. Over-reliance on fossil fuel-based power production will worsen climate change impacts on a country which has been among the top ten most affected countries due to climatic change in the last two decades. Additionally, the economic growth in Pakistan has been picking up in the past few years, and the momentum is expected to continue in the near future. To fuel economic growth additional power will be required. The rapid deployment of renewables will not only help the country meet its growing energy demands but will also result in decarbonising of the energy system thus also complying with its international commitments around environment such as the Paris Accord 2015.

To increase the proportion of RE a vertical action is required both at the national and the provincial levels. In April 2010, the Government of Pakistan passed the 18th Amendment to the Constitution to move the structural affairs of the country from a mainly centralised to a largely decentralised federation. The devolution of power from the centre gives the provinces the autonomy to regulate policy areas including the ones linked to the electricity sector development. The amendment has created hurdles rather than speeding up the development of RE in the country.

The primary purpose of this study is to analyse the impacts of devolution of power to the provinces on the governance of the RE sector. It explores the institutional setup around RE at both the provincial and the federal levels and analyses the mandate of the institutional arrangement.

The study adopted both secondary and primary research tools to gather information. The parameters used in the study to measure the impacts of the 18th Constitutional Amendment include coordination mechanisms between the federal and the provincial levels, institutional setup at both levels, the capacity of the personnel, and mandate of various agencies involved in the RE sector at all levels of governance. For the purpose of the study, a series of RE dialogues were held with relevant stakeholders in the provincial capitals of Karachi, Lahore, Peshawar, and Quetta. Preliminary findings from the literature review and various official documents were shared during the dialogues that helped validate the information gathered from the secondary sources and also accumulate responses from relevant stakeholders. Later, findings of all provincial discussions were presented at a federal level dialogue to cross-examine the claims made at the provincial dialogues.

The study finds that after the 18th Amendment, four main areas have been hampering RE deployment in the country. These include: i) lack of national coordination plan; ii) grid evacuation capacity; iii) lack of institutional arrangements and expertise at the provincial level and; iv) lack of financial control and resources by provinces. Workshops at the provincial level and the federal validated preliminary findings of the study.

In conclusion, the study suggests that to overcome issues emerging after the 18th Amendment regarding the RE sector, the federal and the provincial governments need to develop a well-coordinated strategic plan for renewable development in the country. The study also recommends the government to bring clarity to the roles and responsibilities of institutions, federal and provincial, involved in RE development in line with the devolution of power outlined in the 18th Amendment. The study proposes that all the provinces develop RE policies to create a competitive environment for RE deployment in Pakistan because the vertical action is needed at different levels of government to switch towards a renewable-powered energy system.

Section 1: Contextualising the Study

Introduction

Energy plays a vital role in achieving almost all Sustainable Development Goals (State of Electricity Access Report 2017). The proportion of the global population having access to electricity has grown from 85.0% in 2012 to 85.3% in 2014. Despite recent advances, 1.06 billion people in the world still lack access to modern electricity services (SE4All -- Progress Towards Sustainable Energy 2017). Moreover, the world energy system is established on fossil fuels, resulting in environmental degradation and global warming. To address environmental concerns and ensure sustainable energy supply for all, the global energy sector is being transformed. The governments worldwide have introduced various support mechanisms including but not limited to dedicated renewable energy (RE) policy frameworks and portfolio standards, feed-in-tariffs, and purposeful targets to harness the benefits of renewable energy technologies (RETs).

Around 170 countries have set RE targets, and almost 150 have formulated policies to scale up RE deployment. At present, the share of RE stands at 18% of the total energy consumption of which half is provided by modern RETs. Traditional biomass for cooking and heating supplies the other half. If current policy measures are fully implemented without additional plans, the share of RE in total energy mix at the global level will only increase to 21% by 2030 (REthinking Energy 2017: Accelerating the global energy transformation 2017).

Global energy demand is growing – by 2030 it will increase by 30% in comparison to the level today (REmap: Roadmap for Renewable Energy Future 2016). Therefore, the share of RETs in total global energy mix needs to be elevated to meet the growing energy demands without compromising on environmental concerns. An analysis by International Renewable Energy Agency (IRENA) shows that the cost of doubling the share of RE by 2030 would be $290 billion annually at the global level. This amount is at least four and up to fifteen times lesser than the socio-economic costs borne due to the disasters and related impacts of climate change on health, agriculture, and natural resources. To achieve doubling targets urgent action is required both through national commitments and international support.

Pakistan started harnessing its available RE resources many decades ago. The commercialisation of hydropower programme in the country was recognised as a significant step towards developing renewables by the World Bank. However, it was not until 2006 that the Government of Pakistan (GoP) apprehended the need to devise a comprehensive policy mechanism to promote RE through private sector investment (Malik & Gsänger 2014). Contrary to the global trends, Pakistan has been unable to catch up the momentum set by different countries in the transition towards low carbon energy supplies despite having favourable conditions for RETs development.

Energy demand in Pakistan is rising faster than the RE adaptation. The current government has prioritised to generate power through fossil fuels such as coal-fired and Liquefied Natural Gas (LNG)-based power projects which would have severe consequences on the environment. Although the country is not among the main emitters of carbon and greenhouse gases (GHG), it has been among the top ten most vulnerable countries affected by the adverse consequences of climate change during the period 1996-2015 (Kreft, Eckstein & Melchior 2017).

The energy sector in Pakistan is the most significant source of GHG emissions in the country, contributing approximately 51% of the total emissions . (Framework for Implementation of Climate Change Policy (2014-2030) 2013) The country's Climate Change Framework for Implementation stresses particularly on the role of the energy sector in mitigation efforts related to the reduction of GHG emissions. At the same time, the framework accentuates that the government should develop clean coal technologies[1] which seem to be a paradox at best.

[1] Coal is the largest source of carbon emissions in the world and “clean coal” is simply impossible. See Coal Atlas published by Heinrich Böll Stiftung for details.

Pakistan is a signatory to the Paris Agreement, and GoP ratified the agreement on November 11, 2016, making the country part of a group of over 156 countries (Paris Agreement - Status of Ratification | UNFCC, 2017)committed to curtailing global warming through a reduction in emissions. To achieve Paris Climate Agreement targets, Pakistan needs to step up its efforts to decarbonise the country's energy system which is only possible by switching to renewables. It is necessary for the government to align its RE policy with the climate change policy for clean energy future. It is increasingly essential to make policymakers at the national as well as the provincial level aware of the reality that today's energy choices will have obvious implications on the country's environment in the future.

RE generation will contribute significantly to the energy security of the country. The current choices around energy sector can be risky both economically and environmentally. Overdependence on imported fossil fuels and coal could be tricky in future as their prices have always remained volatile and a lot of cost fluctuations have been experienced in the past (Klevnäs, Stern & Frejova 2015). Apart from that, concentration and availability of fossil fuel reserves only in certain parts of the world increase the risks to the security of energy supply. RE resources, on the other hand, such as solar, wind, and water are naturally distributed in various locations. These can have a positive effect on trade balance by reducing the country's energy import bill. It can generate positive impacts on Pakistan's economy as the country faces a massive trade deficit.

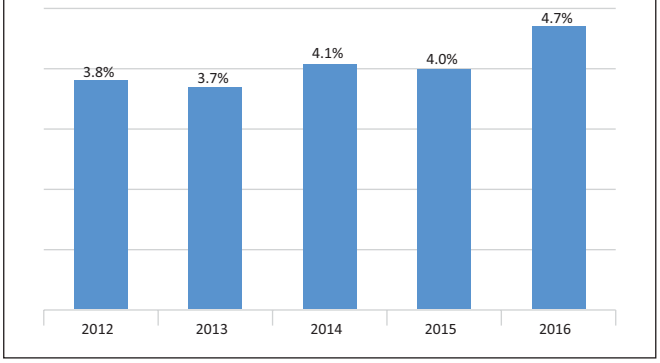
Off-grid RETs offer an opportunity for Pakistan to electrify communities which do not have access to electricity. Off-grid solutions are environmentally sustainable, cost-effective and rapidly deployable to accelerate the scale of electrification (Off-Grid Renewable Energy Systems: Status and Methodological Issues 2015). A developing country like Pakistan has a real chance to leapfrog the traditional stages of grid expansion and build a power system that could provide energy to 27% of the population having no access to electricity. Such a practice would trigger rural development, enhance income, create new jobs and set the stage for transforming lives of individuals as well as communities not connected to the national grid.

Pakistan's Economic and Energy Outlook

The economic growth in Pakistan has been picking up for the second year now as a result of economic reforms and improved security situation. The number of terrorist attacks decreased by 16% in 2017 compared to a year ago (Pakistan Security Report 2018). The Gross Domestic Product (GDP) growth was recorded at 4.7% at the end of the financial year 2016, and the Asian Development Bank (ADB) has projected that the GDP is expected to grow at the rate of 5.2% in 2017 (Asian Development Outlook 2017: Transcending the Middle Income Challenge 2017). The positive projection stems from continuous macroeconomic stability, anticipated energy supply and expected infrastructure development linked to China Pakistan Economic Corridor (CPEC).

Figure 1 highlights the GDP growth of Pakistan during the last five years:

Figure 1: GDP Growth of Pakistan for last Five Years



Source: Asian Development Outlook 2017

Energy is essential for economic growth, human welfare, and new job opportunities. Against the backdrop of economic growth in Pakistan, the energy demand is increasing. Pakistan's energy needs have become noticeable during the past few years as power supplies have failed to match demands. The Ministry of Planning, Development and Reform, in its Annual Plan 2014-15, mentioned that the average electricity supply in the country remained at 14,400 megawatts (MW) while the average demand was recorded at 18,400 MW signalling a shortfall of 4000 MW. The mismatch in demand-supply has constrained the potential of millions of people, industries, and the economy since electricity supply, considered a lifeline of the modern society, is missing. Furthermore, about 144 million people in the country lack reliable access to the grid because in some cases, they are not connected to the national grid, and in others, they experience continuous blackouts. As a result, people spend around $2.3 billion annually on things ranging from kerosene lamps and candles to torches powered by batteries (Pakistan off-Grid Lighting Consumer Perceptions: Overview Study 2015).

If Pakistan is to keep pace with its GDP growth targets, the government needs to overcome the energy crisis. RE offers an optimal solution to these challenges. The rapid deployment of renewables will not only help the country meet its growing energy demands but will also result in decarbonising of the energy system thus also complying with its international commitments around climate change such as the Paris Accord. Even though RE market in Pakistan has started picking up momentum, renewables only amount to 1,558 (Renewable Energy Status in Pakistan, 2017) MW of cumulative capacity constituted by wind (785 MW); solar photovoltaic (PV) (400 MW); small hydro (213 MW) and, bagasse (160 MW). When compared to the total generation capacity of about 25,000 MW, the share of RE is approximately 6% in the country.

To increase the proportion of RE a vertical action is required both at the national and the provincial levels. In April 2010, the Government of Pakistan passed the 18th Amendment to the Constitution to move the structural affairs from a mainly centralised to a mostly decentralised federation. The amendment gives provinces the authority to regulate policy areas including the ones linked to the electricity sector for enabling a conducive environment for the development of the electricity sector.

Purpose of the Study

The primary purpose of the study is to analyse the impacts of devolution of power to the provinces (known as the 18th Amendment to the Constitution of Pakistan) on the governance of the RE sector. The study explores the institutional setup around RE at both the provincial and the federal levels. The study also analyses the mandate of the institutional arrangement to investigate overlaps between the federal and provincial institutions and gauges the personnel capacity of the RE sector of all the four provinces. Moreover, the study also aims to put forward policy recommendations to accelerate RE development in Pakistan.

Methodology

The study adopted both secondary and primary research tools to gather information around RE sector in Pakistan and its governance at various levels. The parameters used in the study to measure the impacts of the 18th Constitutional Amendment include coordination mechanisms between the federal and the provincial levels, institutional setup at both levels, the capacity of the personnel, and mandate of various agencies involved in the RE sector at all levels of governance. In the beginning, a literature review was conducted to know the RE status in Pakistan and also to note the changes that occurred at the policy and institutional levels. A series of dialogues followed with relevant stakeholders at the provincial level to cross-validate the preliminary findings. Later the results were shared with the federal level stakeholders to validate further the claims made at the provincial level.

Methods:

- An extensive literature review was conducted to understand the devolution in the RE sector of Pakistan under the 18th Amendment. The sources used for the study include

research studies and official documents of respective government agencies.

- Unstructured interviews were also conducted to better understand the issues faced by RE sector of Pakistan, particularly, with reference to the 18th Amendment.

- A series of RE dialogues were held with relevant stakeholders at the provincial capitals of the four provinces - Karachi, Lahore, Peshawar, and Quetta. The format of the dialogues included sharing of preliminary findings from the literature review which helped validate the information gathered from the secondary sources during the literature review and also to accumulate responses from relevant stakeholders. A presentation by the related provincial energy department followed. Later the inputs were received through open dialogue and through carefully designed group work. The group work was carried out around three areas: a) institutional arrangements, b) policy and regulatory environment, and expertise/capacity in the RE sector. The results of the group work were documented in an already prepared pro forma/ (Annexure 1). The pro forma had sections for identifying issues/gaps and suggesting solutions/approaches to overcoming those issues. The second section of the paper provides a detailed analysis of this exercise.

Section 2: Institutional, Policy and Regulatory Frameworks for Renewable Energy

The electricity sector including the RE sector in Pakistan had remained mainly under control of the federal government before the 18th Amendment to the Constitution of Pakistan. After the amendment, the electricity as a subject was removed from the concurrent list and made part of the federal list. As a result, the provinces were granted authority to generate, transmit and distribute electricity within their territorial jurisdiction without much involvement of the federal government. Although the provinces were given autonomy of electricity generation, transmission, and distribution, some institutions, primarily the transmission and distribution networks, remained under federal control.

This section explains the overall governance structure of the RE sector in Pakistan, the policy and regulatory frameworks around it and theimpact of the 18th Amendment on RE governance in general and development in particular.

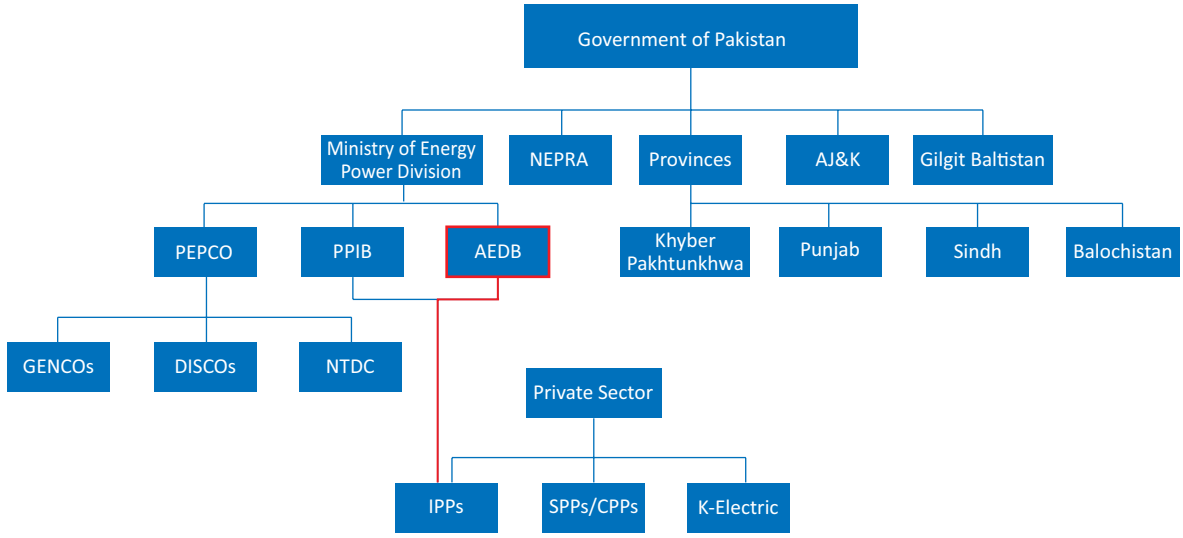
Institutional Mechanism Multiple institutions have been developed over the years to form the governance structure of RE in Pakistan. The table below lists various existing entities with their respective roles:

Table 1: Institutional Setup of Power Sector

Serial No.	Entities/Agencies	Role/Mandate	Operational Level
1.	National Electric Power Regulatory Authority (NEPRA)	Regulation and licencing of power generation, transmission and distribution (only the electricity sector)	Regulatory authority for both federal and provincial levels
2.	Ministry of Energy (MoE) (Power Division)	Policy formulation and overall sectoral development	Operates at the federal level but is responsible for coordination at the provincial level
3.	Alternative Energy Development Board (AEDB)	One-window facility promoting and facilitating RE deployment	Operates under MoE
4.	Pakistan Electric Power Company (PEPCO)	Overlooks thermal power generation, and transmission and distribution networks	Operates under MoE
5.	Distribution Companies (DISCOs) and K-Electric (KE)	Power distribution	Operate under PEPCO
6.	National Transmission and Despatch Company	Power transmission from generators to distribution companies (DISCOs)	Operates under PEPCO
7.	Central Power Purchase Agency (CPPA)	Sale and purchase of electricity	A single entity operating at both federal and provincial levels
8.	Provincial /Regional Energy Departments	Balochistan, Punjab, Sindh, Khyber Pakhtunkhwa, Azad Jammu and Kashmir, and Gilgit Baltistan	Operate at provincial level

Source: Compiled by the author from various official documents and websites

Figure 2: Power Sector Organogram



Source: Developed with the consultation of Director CDM/IC/Solar, Alternative Energy Development Board

National Electric Power Regulatory Authority

The National Electric Power Regulatory Authority (NEPRA) was established through an act in 1997 as an essential body to execute a strategic plan of privatising the power sector. NEPRA's role was to supervise the functions of restructured power structure with the mandate of safeguarding the interests of various stakeholders. The authority was established to develop and follow a regulatory framework. The aim was to ensure reliable, affordable and efficient electricity to power consumers; to transform the power sector from monopoly structure to competitive market; and to maintain a balance between consumers and service providers in the country. Moreover, the authority issues licences for power generation, transmission, and distribution along with setting tariffs for such facilities. Regarding the RE development, NEPRA determines tariff for power generation from various RETs, both at the federal and the provincial levels.

Ministry of Energy

The Ministry of Water and Power (MoWP), renamed as Ministry of Energy (MoE) on August 4, 2017, is the executive arm of the GoP. It deals with issues related to electricity generation, transmission, and distribution. The newly-created ministry has two divisions - the Power Division and the Petroleum Division. The Power Division deals with the electricity sector through a set of agencies and autonomous bodies. Moreover, it executes the federal government's strategies and policies in the power sector of Pakistan. The ministry also coordinates with the provincial governments and relevant agencies in realising national power policy objectives. MoE has designated AEDB to deal with RE policy and development in the country.

Alternative Energy Development Board

The Alternative Energy Development Board (AEDB) was set up in 2003 as the principal agency of the federal government with the objectives to facilitate and promote RETs development in Pakistan. The board is under the executive control of MoE. AEDB is designated as the one-window facilitator at the federal level for developing RE projects. It deals with RE generation projects except for hydro projects having installed capacity larger than 50 MW.

Pakistan Electric Power Company

Separated from the Water and Power Development Authority in October 2007, the Pakistan Electricity Power Company (PEPCO) is a federal entity. It is vested with the responsibility of overseeing thermal power generation and transmission and distribution of electricity in Pakistan. PEPCO is empowered to

deal with the management of ten corporatised distribution companies (DISCOs) and the National Transmission and Despatch Company (NTDC).

Central Power Purchasing Agency

The Central Power Purchasing Agency (CPPA) is a publicly owned market operator that purchases electricity from generation projects at all levels - provincial and federal. CPPA is licenced by NEPRA to buy power from RE producers at 11 kilovolts (kV) voltage and above.

National Transmission and Despatch Company

The National Transmission and Despatch Company (NTDC) is the sole system operator of transmission lines for electricity in Pakistan. It has been licenced by NEPRA to develop, maintain, plan, design and expand the national transmission network. As a government-owned corporation, it operates and maintains 500kV and 220 kV grid stations and transmission lines. Before construction of a power project, developers seek NTDC's approval. In this regard, they conduct and submit evacuation studies for authorisation to NTDC. Based on the review of these studies the NTDC approves power interconnection for RE projects. At a later stage, grid connection agreement is signed between NTDC and the RE project developer. NTDC also transmits power generated from grid-connected RE projects.

Distribution Companies (DISCOs)

The following ten publicly owned DISCOs have been licenced by NEPRA to provide distribution services to consumers in areas defined for respective DISCO.

1. Lahore Electric Supply Company (LESCO)

2. Gujranwala Electric Power Company (GEPCO)

3. Faisalabad Electric Supply Company (FESCO)

4. Multan Electric Power Company (MEPCO)

5. Islamabad Electric Supply Company (IESCO)

6. Peshawar Electric Supply Company (PESCO)

7. Hyderabad Electric Supply Company (HESCO)

8. Sukkur Electric Power Company (SEPCO)

9. Quetta Electric Supply Company (QESCO)

10. Tribal Areas Electric Supply Company (TESCO)

An RE developer may sell electricity directly to a DISCO at 132 kV or below.

Apart from DISCOs, K-Electric (KE), a privately-owned utility, deals with the generation, transmission, and distribution of electricity in Karachi and adjacent areas. It is listed on the Pakistan Stock Exchange as the only private utility company in the country. Contrary to other DISCOs, KE cannot take advantage of government guarantee to buy power from independent power producers (IPPs). KE requires negotiating supporting guarantees directly with IPPs for buying power. However, like other DISCOs, the tariff for electricity purchased by KE must be approved by NEPRA.

Provincial Energy Departments

The provincial energy departments work under the purview of respective provincial governments for implementation of energy schemes within the provinces. These departments support the exploitation of RE within their jurisdiction either on their own or in cooperation with AEDB. Most of the departments have organised their own one-window services to set up RE projects at the provincial level. Besides, the provincial agencies facilitate RE deployment by expediting land allocation process and permitting the private sector to develop RE projects.

Most of the provinces have initiated their own RE development programmes. The Government of Punjab has allocated 6500 acres of land to develop 1000 MW of solar PV projects of which 400 MW has been commissioned and connected to the national grid (Quaid e Azam Solar Power (Pvt) Ltd., 2017). Besides, the Punjab government has also decided to solarise 20,000 schools in the province with a primary focus on remote areas (PID, 2017). On the other hand, the Department of Energy, Sindh, has introduced Sindh Land Grat Policy for Renewable Energy Projects 2015 and issued letters of intent (LOIs) of 2485 MW capacity for wind and 1550 MW of solar PV projects. These projects have not progressed beyond their grid approvals due to changes in the regulatory framework at the federal level.

The energy departments of the two provinces -

Khyber Pakhtunkhwa and Balochistan - have also been working on RE development in their respective regions. The Khyber Pakhtunkhwa government has prioritised developing hydropower projects as the province holds 30,000 MW of hydropower generation potential (Khyber Pakhtunkhwa Hydropower Policy 2016). Balochistan government, on the other hand, has not been successful to mobilise private finance for RE in the province due to distance from grid and challenging terrain issues.

Policy and Regulatory Framework

At a glance, one comes to know that besides a dedicated RE policy in place, RE forms part of the policy framework around energy security and economic development in Pakistan. Energy security through mix technologies is mentioned as an aim of various policies and plans including the Vision 2025. Some of these are discussed below:

- **RE Policies:** The GoP introduced the "Policy for Development of Renewable Energy for Power Generation" (RE Policy 2006) in 2006. Energy security, economic prosperity, social equity and environmental protection were outlined as the key strategic objectives in the policy (AEDB 2006). The policy seeks to promote and enable private investment through RE generation. The RE Policy 2006, along with guaranteed grid connectivity and tariff, provides various fiscal and financial incentives to the private investors for developing RE projects. Listed below are some of the important features of the RE Policy 2006:
    - inviting private investment for IPPs and stand-alone grid power projects
    - permitting frameworks for net-metering and wheeling
    - laying down transparent and simplified tariff mechanism
    - making power purchase mandatory from RE projects.

  The RE Policy 2006 is comprehensive in nature and scope as it underscores the significance of renewables in the context of socio-economic benefits of energy. It places particular directions for scaling up grid-connected and off-grid RE solutions. Different stakeholders see the policy favourably but the ineffective implementation of it has caused the unsatisfactory growth of renewables. The policy stops short of providing a practical roadmap for rural electrification using clean energy resources. Moreover, the policy has failed to achieve any of its set targets. For example, AEDB targeted to generate 880 MW through private investment by December 2012 but only 6 MW of renewable energy was connected to the grid during the stipulated period (Malik & Gsänger 2014).

  The RE Policy 2006 has been superseded by medium-term Alternative & Renewable Energy Policy (ARE) 2011. The ARE Policy expands the scope of RE by including alternative energy resources. These are biogas, biofuels, and waste-to-energy. The policy aimed at harmonising efforts of various government agencies to promote alternative and renewable energy deployment in the country. Besides, it underlined to enhance the technical and institutional capacities of public bodies involved in ARE deployment. It also aimed to promote research and development and develop favourable conditions for local manufacturing of RETs.

- **Net-metering and distributed generation:** These have been incorporated in the overall RE policy mechanism through the introduction of Distributed Generation and Net-Metering Regulations by NEPRA in September 2015 (NEPRA 2015). Under this regulation, any electric grid customer having a three-phase connection can enter into an agreement with a DISCO to install net-meters and small-scale RE installations. The net-metering framework allows customers to receive remuneration quarterly for excess electricity fed into the grid during that period. Until recently, the number of installed net-metered power plants was limited but it is likely to grow as more custom-

ers enter the market and distribution companies enhance capacities to install net-meters at different locations successfully.

- **Economic Policy and RE:** In 2003, the Vision 2025 set out by the Ministry of Planning, Development, and Reform envisaged achieving an annual growth rate of 7-8%.It highlights that the power shortage in Pakistan results in 4-7% loss to GDP per annum, therefore, the Vision 2025 aims to ensure affordable and clean energy for all sections of the society. The Vision 2025 brings the reduction in transmission and distribution losses (over 25 %) at the centre of its agenda (Pakistan Vision 2025 2013). Although it calls for increased deployment of RE including wind, solar, hydro and biomass in the energy mix of the country, the vision does not target any specific amount of RE in a given time.

- **Climate Change Policy:** Pakistan's climate change policy underlines the importance of RE for a reduction in carbon emissions. The policy calls for the promotion of RETs such as solar, wind, and bioenergy. But like Vision 2025, the policy does not specify clear RE targets.

The above-mentioned policies and frameworks show that Pakistan presents promising RE policy and regulatory mechanisms. But this is not enough for scaling up RE deployment in the country. What is required is a strategic plan to deploy RETs effectively through efficient administration procedures. Policy on the paper is essential for providing an enabling environment. But the effectiveness of the policy's implementation through a strategic plan is more critical. Additionally, a policy needs to be evolved as the market matures, primarily since some barriers change and some become more critical at different stages of market development.

Policies around RE and climate change highlight the importance of each other but do not include any coherent mechanism for implementation. Moreover, the federal government has formed those policies, and there seems a missing link in their implementation at the provincial level.

18th Constitutional Amendment and Electricity

Passed by the National Assembly of Pakistan on April 8, 2010, the 18th Amendment to the Constitution moves the structural affairs of the country from a mainly centralised to a largely decentralised federation. The amendment gives provinces the authority to regulate policy areas including the ones linked to the electricity sector for enabling a conducive environment for the development of electricity sector.

Article 157 of the Constitution of Pakistan

After the 18th Amendment to the Constitution of Pakistan, electricity as a subject comes under Part II of the Federal Legislative List. The article dealing with power is copied below:

"157. Electricity. (1) The Federal Government may in any Province construct or cause to be constructed hydro-electric or thermal power installations or grid stations for the generation of electricity or lay or caused to be laid inter-Provincial transmission lines [:]
Provided that the Federal Government, prior to taking decision to construct or cause to be constructed, hydro-electric power station in any Province, shall consult the Provincial Government concerned.
2. The Government of any Province may —
a) to the extent electricity is supplied to that Province from the national grid, requires supply to be made in bulk for transmission and distribution within the Province;
b) levy tax on the consumption of electricity within the Province;
c) construct power houses and grid stations and lay transmission lines for use within the Province and;
d) determine the tariff for distribution of electricity within the Province.
3. In case of any dispute between the Federal Government and Provincial Government in respect of any matter under this article, any of the said Governments may move the Council of Common Interests for resolution of the dispute."

Source: The Constitution of the Islamic Republic of Pakistan

A general reading of Article 157 indicates that the federal government may make laws as far as construction of power projects and grid installations and inter-provincial transmission lines are concerned. But the word "may" suggests that it is a directing provision rather than a mandatory one. This means that the subject is not under exclusive federal power. In fact, it implies that the relevant provincial governments need to be taken into confidence. It can be inferred that the federal government will not construct a hydro or a thermal power station without the consultation of the relevant province.

Article 157 outlines provincial mandate with regards to electricity generation, transmission, and distribution. A province may construct power projects and grid installations and transmission lines on its own but only for use within the boundaries of that province. Moreover, any province may also determine tariff for electricity distribution within its geographical limits.

With regards to RE deployment, it can be said that any province can initiate RE projects and connect them to the national grid. But if the province plans to use RE generation within the territory of the subject province, it can also determine tariff for such generation. Under these circumstances, the province has to lay its own transmission and distribution network.

Issues after 18th Amendment in RE Sector

After reviewing relevant literature, four main areas were identified that had been hampering the RE deployment in the country. These include: i) lack of national coordination plan; ii) grid evacuation capacity; iii) lack of institutional arrangements and expertise at the provincial level and; iv) lack of financial control and resources by provinces. The issues were discussed and debated during the dialogue workshops held in Peshawar, Lahore, Karachi, and Quetta to see if they have been rightly pointed out. The preliminary findings of the study were validated during the workshops. The table below reflects the outstanding issues in different provinces:

Table 2: Gaps/Challenges in RE Sector - post-18th Constitutional Amendment

	Khyber Pakhtunkhwa	Punjab	Sindh	Balochistan
Lack of national coordination plan	✓	✓	✓	✓
Grid evacuation capacity	✓	✓	✓	✓
Lack of institutional arrangement and expertise at provincial level	✓	✓	✓	✓
Lack of financial control and resources	✓	–	–	✓

Table 3 highlights the results of the pro forma distributed during the four workshops. The exercise meant to gather well-grounded information from various stakeholders regarding the issues faced by Pakistan's RE sector. The participants were also asked to outline possible solutions to challenges confining this sector's growth. The findings of the workshops have been discussed in detail after Table 3 and in the final section of this study.

Table No 3: Summary of Workshops' findings in Provinces

			Khyber Pakhtun-khwa	Punjab	Sindh	Balochi-stan
Institutional Arrangements	Issues/Gaps	• Distribution and transmission is centralised and controlled at the federal level	✓	✓	✓	✓
		• Tariff is determined at the federal level and not at the provincial level	✓	-	✓	-
		• At the federal level there is a s ingle power purchaser (CPPA) and none at the provincial level	✓	✓	✓	-
		• Delay in the processing of RE process-approvals	✓	✓	✓	-
	Solutions/ Approaches	• Distribution and transmission should be devolved to the provinces	✓	-	✓	✓
		• Provinces should be empowered to determine tariff	✓	-	✓	✓
		• Competitive market should be developed by introducing multiple power purchasers	✓	✓	✓	✓
		• A coordination mechanism be established for better communication between provinces and the federal level	✓	✓	✓	✓
Policy and Regulatory Environment	Issues/Gaps	• Central policy not implemented in provinces	✓	✓	✓	✓
		• The changes are abrupt when I t comes to regulations	✓	✓	✓	-
		• Lack of one-window facility	✓	✓	✓	✓
		• There is no national action plan that would set comprehensive and overall targets for the sector	✓	✓	✓	✓
	Solutions/ Approaches	• Provincial RE policies should be introduced	✓	✓	✓	✓
		• Stable regulatory environment should be maintained	✓	-	✓	✓
		• RE cap of 5% should be removed	-	-	✓	-
		• Solar and wind deployment plans should be developed	-	-	✓	✓
Expertise in RE Sector	Issues/Gaps	• Lack of technical expertise at provincial level	✓	✓	✓	✓
		• Lack of capacities at the provincial level in dealing with investors	-	-	-	✓
		• Limited availability of local skilled labour	✓	–	✓	✓
	Solutions/ Approaches	• Training exposure visits should be conducted for provincial officials	✓	✓	✓	✓
		• Skills develo pment cells should be established in provinces	✓	✓	-	-
		• Degree programmes should be started on RE in universities	✓	✓	✓	-
		• RE labs should be established in the country	-	✓	-	-

Lack of National Coordination Plan

In the context of this study, coordination is referred to coherent, consistent, inclusive and comprehensive communication and implementation mechanism for policies and plans between and among national and provincial government departments. Inter-sectoral coordination at the national and provincial levels is of a high significance for planning and executing developmental programmes. In this regard, the coordination among various line departments within the RE sector and with those outside it is weak at all levels of governance. The lack of liaison can be attributed to the 18th Amendment rather than the lack of coordination mechanism.

Owing to the devolution of power to the provinces many line departments were made provincial subjects while some stayed at the federal level resulting in a state of confusion and overlap in the roles and responsibilities of various institutions. An example from the energy wing at the Planning Commission which is responsible for formulating the development plan for the power system and energy, illustrates this well. In 2010 the energy wing formulated scenarios that envisioned 15% share of RE in the energy mix of Pakistan by 2030 (Pakistan Integrated Energy Model 2010). But a year later, NTDC in its power plan reflected only 5.5% share of renewables in the total installed capacity by 2030 (National Power System Expansion Plan 2011 - 2030 2011). Similarly, the Vision 2025 by the Ministry of Planning, Development, and Reform discusses increased RE deployment. However, it stops short of specifying any RE development target in a set period (Pakistan Vision 2025 2013). The framework for Implementation of Climate Change Policy highlights the importance of integrated approach on climate change and energy policies. At the same time it also calls for developing coal technologies to meet growing energy demands of the country. Most objectives spelled out in the implementation framework are opposite to the current priorities of the government (Framework for Implementation of Climate Change Policy (2014-2030) 2013). Such practises show a lack of communication, collaboration, and consultation on plans among different relevant government agencies at the planning stage.

Another issue is that of failure to achieve targets set in the RE Policy 2006. AEDB was assigned the responsibility to achieve the goal of generating 880 MW of power using RETs through the private sector participation by end 2012. By that period, only 6 MW of RE generation capacity was added to the national grid (Malik & Gsänger 2014). There was a mismatch between the number of LOIs issued by AEDB to the private sector for power generation through wind and solar, and the capacity cap set by NTDC to integrate renewables in the power system of Pakistan. The Department of Energy, Sindh issued LOIs to some investors to develop wind and solar energy projects based on FIT. But the regulatory shift from NEPRA to auctions for solar and wind projects left those LOI holders in the lurch, and they are struggling to move forward to develop their projects. Besides, the 2900 MW of LOIs issued by Sindh government are not part of NTDC's grid development plan because those LOIs were issued independent of the federal entity's involvement.

The provincial and federal entities lack synchronised efforts. During the workshops at the provincial level, the participants also highlighted several issues. Those from Khyber Pakhtunkhwa and Sindh raised the issue of tariff determination. They pointed out that this was one of the main reasons for sluggish RE growth in the country. Officials representing the Khyber Pakhtunkhwa government were of the view that tariff determination was not under the control of the provincial government which created uncertainty in developing RE projects in the province. But the provincial government is devising its own tariff mechanism for off-grid RE projects. This would electrify rural communities not connected to the national grid. Representatives of the Sindh government were also critical of the tariff determination mechanism. They questioned the regulatory shift to auctions regime for wind and solar projects by NEPRA that resulted in a complete stagnation in the market.

Grid Evacuation Capacity

Limited grid capacity to integrate variable RE is considered as the most pressing challenge in the progress of RE in Pakistan. Although the 18th Amendment empowers provinces to generate, transmit,

and distribute electricity using renewable sources within territory of a province, the provincial governments have no control over NTDC which is a federal entity operating the power system transmission network in the country. The participants from the four provinces highlighted this particular issue during the workshops. An official from the Khyber Pakhtunkhwa government discussed that due to unavailability of interconnection facilities, operations of some RE projects, especially hydropower projects had been delayed in the province. The Sindh government representative also highlighted the interconnection problem that results in delays in wind power projects. It was shared that wind projects already connected to the national grid face the challenge of tripping and shutdowns due to weak transmission network in the wind corridor of the country. A representative from the Balochistan government also spotlighted the issue of limited grid evacuation capacity. He said that little attention is given to the province due to its demographic features. The officials from these three provinces argued that the transmission networks should be handed over to the provincial governments within their respective territories.

Although the federal government is working on the generation part, little is being done on transmission and distribution fronts as the current system needs to upgrade and modernise in order to accommodate higher share of RE in the future. Rather than a centralised one, the future power system will be more distributed and flexible in nature. The provinces must be allowed to control the transmission networks in their territorial jurisdictions in light of the 18th Amendment.

Lack of Institutional Arrangement and Expertise at Provincial Level

The electricity had mainly remained in the hands of the federal government before the 18th Amendment. After the amendment and with the abolition of Concurrent List, the electricity sector was placed on the Federal List. Before the amendment, the provinces had little to do with the power sector. But the amendment allowed the provinces to deal with power generation, transmission, and distribution. The participants shared that although the provinces were empowered, they lacked institutional arrangements and expertise regarding the power sector. The provinces could start power production but they lack dedicated institutions such as transmission and distribution networks to exercise control over the electricity sector. Similarly, limited knowledge of developing RE projects was also outlined as a challenge because before the 18th Amendment, the electricity sector was entirely under the control of the federal government.

The Sindh government has created the Sindh Transmission and Dispatch Company and envisioned its role as a transmission network operator. But as DISCOs are not under provincial control and in the absence of a consumer base, it cannot operate in the province without working together with NTDC – the grid operator at the national level. The Khyber Pakhtunkhwa government also plans to build transmission lines through Chinese investment but due to delay in the approval process by NTDC, the plan is likely to take longer than expected. The provinces need to have a consumer base to make such initiatives successful. That is lacking at the moment because of the absence of control over transmission and distribution business.

Lack of capacities at the provincial level has also been constraining the development of RE in the country. This issue was highlighted during each of the four provincial workshops. A representative of the Khyber Pakhtunkhwa government stressed that the provincial government had remained focused on hydro projects until 2014 but it is now struggling to develop wind and solar power projects due to limited capacities in these sectors. An official of the Balochistan Energy Department pointed out that the government struggles to deal with private investors interested in developing RE projects due to limited capacities and experience.

Lack of Financial Control and Resources

Finance is vital to develop any power project including RE projects. The participants of the workshops highlighted many issues related to lack of financial control and resources. The one at the forefront was that of sovereign guarantee. The provinces can provide sovereign guarantee to

investors for developing RE projects. Nonetheless, the limit of a particular sovereign guarantee, for projects that cost more than Rs10,000 million and that involve foreign component, is determined by the Executive Committee of the National Economic Council which is a federal entity. Lack of power at the provincial level to regulate the limit of sovereign guarantee causes delays in RE projects. It was also pointed out during the workshops that foreign investment in provinces is channelised through the federal government as provincial governments lack full jurisdiction in attracting foreign investment. Limited financial resources and authority available to the provincial governments in attracting foreign investment has impeded the growth of the RE sector in the respective provinces. From the discussion, it can be understood that the preceding issues that have arisen after the 18th Amendment have been restricting the development of RE in Pakistan. Mainly the following four issues need to be resolved in the light of the 18th Amendment to scale up RE growth in Pakistan:

- lack of coordination mechanism between the federal and the provincial governments
- lack of provincial control over transmission, and distribution networks
- lack of capacities at the provincial level to develop RE lack of financial control and resources in the provinces

Section 3: Looking into the Future

The following actions are pertinent in resolving the governance barriers in RE sector of Pakistan. Emphasis is laid on taking integrated approach between the provinces and the federal government to foster RE growth.

Strategic Plan for RE Development

Pakistan's economic growth in recent years places a massive demand on its energy resources. Energy demand will surge with a growing economy. To meet the increasing energy demands without worsening climate change impacts, Pakistan needs to design a comprehensive action plan for rapid RE deployment. Such a plan will help the country achieve dual targets of energy self-sufficiency and limit carbon footprint simultaneously. Policies are useful only if implemented. Targets set in policies can only be achieved if there are sound enforcement and implementation mechanisms to oversee compliance. Although a policy framework for RE development is in place since 2006, the country lacks direction in terms of an action plan to implement the RE policy which has resulted in failure to achieve set targets.

The action plan should not only aim to address grid-connected RE generation but also off-grid clean energy solutions especially for 32% of the population which does not have access to electricity. The RE solutions such as solar home systems and micro-hydro projects have now become cheaper to electrify communities not connected to the grid. Extra costs for transmission network can be avoided while developing autonomous off-grid projects. Moreover, the plan should be implemented in close coordination with the provincial and local government structures where required. Such an integrated model will help smooth deployment of clean energy and assist policymakers in making well- informed and better decisions.

The plan should also target grid modernisation as transmission and distribution are equally crucial to power generation. Modernisation of the electricity grid is key to integration of RE as resources such as wind and solar are variable and intermittent in essence. Approaches to developing the grid should be redesigned given the set of challenges presented by RE resources. Although little penetration of RE does not pose severe problems for the grid, accommodating higher share of generation through RE sources will require new approaches to operating and extending it.

Smart grid technologies allow a higher penetration of RE in the electricity system by making it more flexible, responsive and intelligent. Smart grid technologies can enrich productivity and efficiency of RE generation when combined with RE resource forecasting and demand-side management. Developing smart grid for future energy system offers an opportunity to Pakistan to progress towards a modern grid system for improving reliability.

Aligning the RE policy with the climate change policy should also be made part of the strategic plan. It is necessary for the government to do so for clean energy future. As Pakistan possesses some of the best RE resources in the world, it should plan to include clean energy resources as part of its future vision to meet international commitments.

Clarity in the Roles and Responsibility of Institutional Mandate

Clarity of institutional roles and responsibilities along with streamlined procedures is essential for low-carbon energy transition. The effectiveness of RE policies can only be successful if duties of various related institutions are well defined. The dedicated roles of institutions are usually part of RE legislations. Given the variety of stakeholders interlinked in the energy sector ranging from distribution companies and regulatory authorities to grid operators, coordination among these institutions is vital for smooth RE development.

As discussed in the previous section, there remains some misunderstanding between the roles of provincial energy departments and the federal government especially after the 18th Constitutional Amendment to the Constitution of Pakistan. The amendment enables provinces to generate, transmit and distribute electricity on their own within the territory of a province. But developers still need

certain applications approved by the federal government. This makes it difficult for them to develop projects under the direction of a single province. As provincial and local governments are becoming more critical when it comes to RE development, roles and responsibilities of the federal, provincial and local government institutions should be redefined and made clear. Management of electricity sector should be handed over to the provinces in their territorial limits for effective control over the generation, transmission, and distribution of power.

Provincial Policies for RE

As RE has become crucial for low-carbon future, energy departments at the provincial level play a vital role in accelerating and facilitating a transition towards a decarbonisation of energy system developments. Such efforts include policies which enable economically feasible solutions, foster technological innovation, employ a wide range of RE solutions and engage the private sector and people in energy generation.

State policies have been instrumental in building up RE revolution the world over. The state of California in the United States of America is the prime example in that case as a combination of laws and policies have made the clean energy revolution possible. California today is home to some of the world's largest wind, solar PV, solar thermal and geothermal power projects. The success of RE growth in India can also be traced in RE policies at the state level. RE development depends on each state's own policy support and regulatory frameworks. National policies and strategic plans only provide direction and guidance to state governments for RE promotion. In Pakistan too, the provinces need to realign their existing policies and regulatory frameworks to decarbonise the energy system for the future.

For rapid deployment of RE in Pakistan, there is a compelling need for local manufacturing of RETs. Local production would not only trigger reduction of RETs costs but would also speed up local industrial development. Domestic production facilities will create new job opportunities in the RE sector resulting in a larger local supply chain. It is suggested that the provincial governments should diligently support domestic manufacturing and provide an enabling environment for production hubs for RETs. It is imperative to note that local manufacturing might be costly in the beginning as cost reduction through learning-by-doing is higher when technologies are still in infancy. But strengthening domestic production will aid long-term targets of scaling up RE development. The provincial governments would do well to incentivise the private sector for local manufacturing by having a stable policy mechanism that entices the private sector and foreign direct investment.

Conclusion

The socio-economic and environmental benefits have prompted harnessing of renewable resources around the world at a rapid scale. In contrast, the pace of RE deployment in Pakistan is slower compared to the global trends. The centalised structure of the power system in a federation that consists of multiple administrative units impedes growth. The 18th Constitutional Amendment, passed in 2010, moved the structural affairs of the country from a centralised to a decentralised federation. The electricity sector was placed on the Federal List that provided the provinces autonomy to control generation, transmission, and distribution of power within their territorial limits. However, ineffective implementation of the amendment created confusion over the governance structure of RE sector. To remove barriers to RE progress, the strategy of power devolution in the light of 18th Constitutional Amendment requires implementation.

Necessary steps need to be taken, like developing a strategic plan over RE and defining roles and responsibilities of the provincial and the federal institutions involved in RE development. Moreover, a promising approach would be the provision of autonomy to the provinces for scaling up clean power development. The federal and the provincial governments should work hand in hand for the promotion of RE. Such efforts will help the country meet its objectives of improving electrification rate, foster economic development, decarbonise the power system and honour its international commitments around climate change. It is possible only if a well-structured and defined governance mechanism for RE development is in place at both levels of government.

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Annexures

Annexure 1

Renewable Energy Dialogues in Pakistan

Group A: Institutional Arrangements

Issues/Challenges	
Gaps	
Solutions	
Approaches	

Group B: Policy and Regulatory Environment

Issues/Challenges	
Gaps	
Solutions	
Approaches	

Group C: Expertise in RE Sector

Issues/Challenges	
Gaps	
Solutions	
Approaches	

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