

Renewable Energy Policy in Pakistan: a critique

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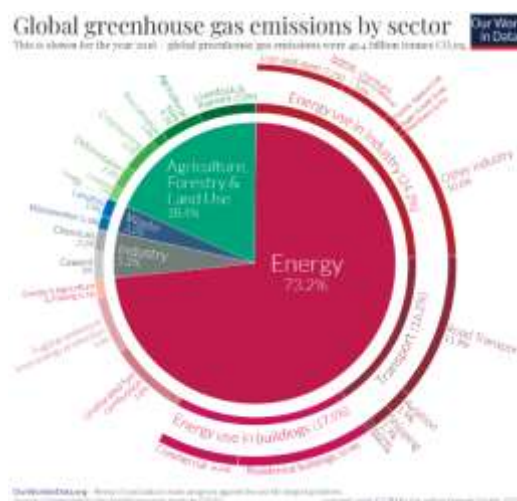
1 Introduction

The Conference of Parties adopted the Paris Agreement in its twenty-first session (COP21). This agreement recognised climate change as an urgent and potentially irreversible threat¹ requiring an effective and appropriate global response. Various steps and measures were prescribed in the Paris Agreement to tackle this common concern faced by human societies and planet earth. The reductions in greenhouse gas (GHG) emissions, among others, have been advocated as an appropriate solution to climate change since then.

The energy sector has been a significant contributor to GHG emissions for using hydrocarbons as the primary fuel. It has been estimated that the energy sector contributes 73% approximately to GHG (see figure 1 below). The data also confirms that 84%² of energy is being produced from fossil fuel sources. Renewable energy sources have been considered substitutes and one of the most acceptable pathways³ for fossil fuel energy sources.

Most countries shifting to alternate and renewable energy sources are taking policy measures and actions to mitigate GHG emissions and climate change threats. These policy measures, among other issues, can be assessed on the aspects of a country's preference for renewable projects (REPs) based on their source, incentives and tariffs, connectivity to transmission systems/national grid, and procurement process for public utility.

Figure 1: Sectoral Contribution to GHG



¹ United Nations, *COP21 Paris Agreement* (UN 2015)

² BP, 'Statistical Review of World Energy' (BP, 2020) <<https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>> accessed 22 Jan 2021

³ Alejandra Elizondo and others, 'Mexico's low carbon futures: An integrated assessment for energy planning and climate change mitigation by 2050' (2017) 93 *Futures* 14

Source: Our World in Data⁴

Being categorised⁵ as one of the Next Eleven Countries (N-11), Pakistan is at the energy transition crossroads. Like many other countries, it has promulgated policy initiatives and actions for renewables to mitigate GHG emissions and climate change threats. It has recently issued a new policy, i.e., 'Alternate and Renewable Energy Policy 2019' (ARE 2019). This paper is a critical analysis of ARE 2019 based on the following: scope of REPs covered by the policy, procurement process for public utility, other avenues for REPs, incentives and benefits, and just transition of workforce from fossil fuel industries to renewables sources.

2 Overview of energy and renewables in Pakistan

A brief overview of the energy sector and the energy transition towards low-carbon through renewables in Pakistan are as follows:

2.1 Generation Capacity

The State of Industry Report issued by NEPRA for the year 2020 states⁶ that Pakistan has an installed generation capacity of 38,719MW at the close of June 2020. 35,735MW has connected the NTDC system, whereas 2,984MW is connected to the K-Electric system. The report also states that out of the country's total generation capacity, 2,147 MW is produced by renewable energy sources. Solar, Wind and Biogas contributed 0.58%, 2.36 %, and 0.46 to the electricity procured by Central Power Purchasing Agency, Pakistan.

National Electricity and Power Regulatory Authority was set up in 1997 to work as a regulator in a liberalised market. Alternate Energy Development Board⁷ was established in 2003 to facilitate and promote alternate and renewable energy in Pakistan. It has also worked as a 'One-Window Facilitator' to approve renewable energy projects under the ARE 2019. However, NEPRA has been vested with powers to determining the tariff for the renewables energy projects generating energy for public procurement.

2.2 GHG Emission Targets

The parties to COP21 agreed upon keeping the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels. The Conference also obligated the parties to submit the nationally determined contributions (NDC) to the GHG emissions. Pakistan also submitted its NDCs' in 2015.

⁴ Hannah Ritchie and Max Roser, 'Emissions by sector' (*Our World in Data*, <<https://ourworldindata.org/emissions-by-sector>> accessed 22 Jan 2021

⁵ Sandra Lawson, David Heacock and Anna Stupnytska, 'Beyond the BRICs : A look at the Next 11', *BRICs and Beyond* (Goldman Sachs 2007)

⁶ National Electric Power Regulatory Authority Pakistan, *State of Industry Report 2020* (NEPRA 2020)

⁷ AEDB, 'Alternate Energy Development Board' <<http://www.aedb.org/ae-technologies/biomass-waste-to-energy/53-about-aedb>> accessed 28 Jan 2021

Pakistan emissions in global cumulative CO₂ emissions account for less than 0.5%.⁸ In 2015, Pakistan estimated⁹ its Nationally Determined Contributions (NDCs) from the energy sector to 185.7 MT CO₂ equivalent, which forms 46% of Pakistan's total GHG emissions. It also projected the intended NDCs to GHG emissions from the energy for 2030 at 898 out of 1603 MT CO₂ equivalent (56% of the total GHG emissions). ARE 2019 states Pakistan's ambition to acquire 20% of its electricity generation capacity from renewable sources by 2025 and further enhance it to 30% by 2030.

3 Analysis

Pakistan aims to respond to the threats posed by climate change by adopting renewable energy sources as sustainable and clean energy. In addition to the transition to low-carbon, Pakistan has also been undergoing liberalisation reforms since 1994. This liberalisation from the state monopoly to a competitive market has been underway. Renewables as an alternate source of energy were introduced in 2006 in different electricity market conditions. ARE 2019 has been issued to mitigate the effects of CO₂ emissions from fossil fuels in the energy sector, asserting transition to renewables as a substitute for fossil fuels/hydrocarbons. Following is the analysis of the ARE 2019 based on its efficacy and sufficiency for Pakistan's ambitions towards a low-carbon economy.

3.1 Scope of renewables and national framework

Pakistan's first renewable policy in 2006 was only able to add 1235.20 MW capacity through wind power projects¹⁰ and 430 MW through solar projects¹¹ into the system. The significant barriers noted¹² for this policy's failure included regulatory insufficiency, high upfront cost, lack of proper subsidies, and institutional coordination.

ARE 2019 lists, among others, the Alternate Renewable Energy Technologies, such as geothermal, hydrogen, synthetic gas (produced from sources other than fossil fuels), solar, and on-shore and off-shore wind to be covered under the policy. The policy also provides governmental discretion in the form of a different framework for any other renewable technology. The policy's benefits may be accessed on renewable project models that can be a hybrid of one or two renewable energy technologies as listed by the policy. The storage technologies have also been considered at par with other renewables technologies for applicability of policy incentives.

The nuclear energy and hydropower technologies in Pakistan are not covered by the ARE 2019. Nuclear energy technology is operated and controlled by the Pakistan Atomic Energy

⁸ Hannah Ritchie and Max Roser, 'What share of global cumulative CO₂ has the country emitted?' (*Our World in Data*, 2017) <<https://ourworldindata.org/co2/country/pakistan?country=PAK~MEX~NGA>> accessed 22 Jan 2021

⁹ Pakistan, *Pakistan's Intended Nationally Determined Contribution (PAK-INDC) 2015*

¹⁰ Alternate Energy Development Board, 'Current Status of Wind Power Projects' (*Pakistan*, 2020) <<http://www.aedb.org/ae-technologies/wind-power/wind-current-status>> accessed 22 Jan 2021

¹¹ Alternate Energy Development Board, 'Current Status of Solar PV Power Projects' (*Pakistan*, 2020) <<http://www.aedb.org/ae-technologies/solar-power/solar-current-status>> accessed 22 Jan 2021

¹² S. A. A. Shah, Y. A. Solangi and M. Ikram, 'Analysis of barriers to the adoption of cleaner energy technologies in Pakistan using Modified Delphi and Fuzzy Analytical Hierarchy Process' (2019) 235 *Journal of Cleaner Production* 1037

Commission.¹³ However, NEPRA has been setting the nuclear energy tariff and hydropower tariff for public procurement. Water and Power Development Authority (WAPDA) exercises the control of generation about all the hydel projects in the country except the generation capacity of less than 50MW. It has been mentioned in the ARE 2019 that another policy is under consideration for small hydro technology.

3.2 RE Procurement for public utility

*Private sponsors and financiers are more than willing to invest in renewable energy based on the well-designed procurement process.*¹⁴ The procurement process for public utility is one indicator that may be used to understand the governments' initiatives for renewables and clean energy.

ARE 2019 states that public utility procurement shall be done primarily based on transparent, competitive bidding. Alternate Energy Development Board (AEDB), an independent, autonomous body to act as a one-window facility to process the REPs, is the authorised body to deal in procurement for the volume on an annual basis. These auctions must be done on the nodes at the locations prescribed¹⁵ by the Indicative Generation Capacity Expansion Plan (IGCEP). The national grid company has prepared this plan under its mandate of power system planning based on demand forecast.

The policy also permits procurement through government-to-government mode and an unsolicited proposal with the condition that the resultant tariff is below the national average basket of generation.

The procurement methods defined by these policies and laws seem transparent. However, Pakistan's primary procurement method for public utility seems to be controlled by the output¹⁶ requirements instead of making the market more attractive for renewables investment. The renewable's capacity enhancement (even for the displacement of expensive fossil fuel plants) has been subjected to the output requirements of IGCEP. This shift of ARE 2019 for controlled investment in renewables and the acceptance of unsolicited proposal on its tariff below the national average generation basket makes the renewables market less appealing for RE investors.

3.3 Other avenues for REPs

ARE 2019 also provides for projects and activities that are not entirely carried out for the public utility. Captive power and off-grid solutions, such as micro-grids and localised energy systems, have been recognised as independent activities under the ARE Policy. However, for Pakistan's national goals for a shift towards clean energy, any generation capacity added through these avenues would be counted in the national goals despite their independence from government regulation and benefits. The policy highlights micro/mini-

¹³ National Electric Power Regulatory Authority Pakistan, *State of Industry Report 2020*

¹⁴ Anton Eberhard, Joel Kolker and James Leigland, *South Africa's Renewable Energy IPP Procurement Program: Success Factors and Lessons*

¹⁵ National Transmission and Dispatch Company, *The Indicative Generation Capacity Expansion Plan (2018-2040)* (NTDC - Pakistan)

¹⁶ Pakistan, 'Alternative & Renewable Energy Policy, 2019' (AEDB, 2019)

<http://www.aedb.org/images/ARE_Policy_2019_-_Gazette_Notified.pdf> accessed 22 Jan 2021

grids and localised energy systems' safety and suggests safety certifications monitoring by AEDB.

ARE 2019 and the existing legal framework in Pakistan provides for the benefit of net-metering. Net metering is governed by the NEPRA (Alternative & Renewable Energy) Distributed Generation and Net Metering Regulations, 2015. These regulations regulate the relationship between the distribution company and the consumer for net metering. However, the framework's effectiveness and efficacy and its impact on the low carbon energy transition require a further independent study.

3.4 Incentives and benefits

The energy transition towards low carbon is driven by policies¹⁷ to reduce GHG emissions. Therefore, policymakers have been adopting various economic models to incentivise the market for renewables. These policies and tariffs are also incentivised to attract RE¹⁸ investment because RE per unit cost is expensive than traditional energy production. Feed-in Tariff, a price set by the Government,¹⁹ has been one incentivising tool to attract investment for renewables. FiT generally comprises a fixed price sufficient to cover the investment, guaranteed grid connectivity and a long-term purchase contract.²⁰

ARE 2019 does not offer the capacity payments or 'FiT' for the REPs. It states²¹ that there would be no capacity payments for renewables.²² REPs' tariff would be determined on the energy purchase price only. However, NEPRA has been granted the power to allow the cost-plus tariff²³ to prefer technological induced REP. The data is not publicly available for any development about approval of cost-plus tariff for technological induced REP. The Federal Government notified FiT for solar projects, later revision decreased the subsidy, and now it has been stopped.²⁴ The policy provides for the fiscal incentives at the time of issuance of ARE 2019 along with the protection against the tax law change for the REPs.²⁵

The lack of incentives in ARE Policy 2019 is a significant shift from Pakistan's earlier policy that offered various incentives to the on-grid renewable projects. Along with Pakistan's one-buyer model, these incentives had '*protected renewables against commercial risks, and technology obsolescence risks, making them financially viable and hence bankable.*'²⁶

¹⁷ Jorge Blazquez, Rolando Fuentes and Baltasar Manzano, 'On some economic principles of the energy transition' (2020) 147 Energy Policy 111807

¹⁸ Hogg Katy and Regan Ronan O', 'Renewable energy support mechanism: an overview' in Michael Rudd Matt Bonasss (ed), *Renewables* (Globe Law and Business 2010)

¹⁹ Dewi Yuliani, 'Is Feed-In-Tariff Policy Effective for Increasing Deployment of Renewable Energy in Indonesia?' in Channing Arndt Douglas Arent, Mackay Miller, Finn Tarp, and Owen Zinaman (ed), *The Political Economy of Clean Energy Transitions* (Oxford Scholarship Online 2017)

²⁰ Miguel Mendonca, 'Feed-in tariffs: Accelerating the deployment of renewable energy' (2012) Feed-in Tariffs: Accelerating the Deployment of Renewable Energy 1

²¹ Pakistan, 'Alternative & Renewable Energy Policy, 2019'

²² Ibid, p 11

²³ The Feed In Tariff Regulations were issued in 2015.

²⁴ Robert Bacon, *Learning from Power Sector Reform : The Case of Pakistan* (2019)

²⁵ Pakistan, 'Alternative & Renewable Energy Policy, 2019', p 18

²⁶ Malik Sadia, Qasim Maha and Saeed Hasan, *Green Finance in Pakistan: Barriers and Solutions* (ADB Working Paper Series)

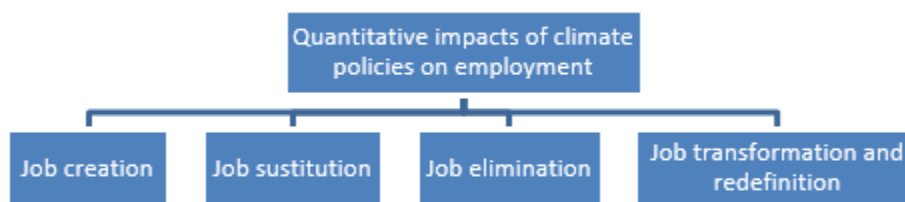
Compared to its earlier policy, Pakistan has minimised the current policy’s incentives under the garb of cost-effectiveness for REPs. Furthermore, ARE 2019 deviating from Pakistan’s earlier policy has shifted the risk of intermittence (the source risk) entirely on the REP.²⁷ This transfer of risk to the REP is another detriment to the potential investment in REPs.

Pakistan intends to move towards a more competitive market. This intention is also evident from the amendments (2018) in the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 and other administrative measures (for instance, proposals to introduce the Competitive Trading Bilateral Contract Market (CTBCM) Model). However, the incentives and benefits required to attract potential investors for renewables’ capacity in the national generation basket are minimal in the current policy. This situation may halt the progress towards a low-carbon economy.

3.5 ‘Just Transition’ factored in RE Policies of Pakistan, Mexico, and Nigeria

The energy transition to a low carbon economy may affect the workforce working in the energy sector in four²⁸ different ways. (see figure 2 below). It raises concerns for the transition of the existing labour in a low carbon economy. COP21 has addressed this issue by stating that the energy transition’s social and economic impact on the engaged workforce has to be aligned with human development. Heffron, while expounding on the issue of just transition, states, ‘it *aims to reduce inequality in a modern society, which it achieves by applying justice in the areas of Climate, Energy and Environment.*’²⁹

Figure 2: Impact on the employment³⁰



The International Labour Organisation also laid out the guiding principles for just transition.³¹ These principles focus on ‘*the need to provide an enabling environment for enterprises, workers, investors and consumers to embrace and drive the transition towards environmentally sustainable and inclusive economies and societies.*’³²

²⁷ Pakistan, 'Alternative & Renewable Energy Policy, 2019'

²⁸ United Nations Framework Convention on Climate Change, *Technical Paper: Just Transition of the Workforce, and the Creation of Decent Work and Quality Jobs* (UNFCCC 2020)

²⁹ Raphael Heffron and Darren McCauley, 'What is the 'Just Transition'?' (2017) 88c Geoforum

³⁰ United Nations Framework Convention on Climate Change, *Technical Paper: Just Transition of the Workforce, and the Creation of Decent Work and Quality Jobs*

³¹ International Labour Organisation, *Guidelines for a just transition towards environmentally sustainable economies and societies for all*, (ILO 2015)

³² Ibid, para 13 (d)

The renewables' policy in Pakistan, besides falling short on adequately incentivising renewables, also does not sufficiently provide for imperative steps required for the just transition of the workforce from fossil fuel electricity generation to renewable sources. However, these policies and governmental actions provide sectoral incentives on industrial activities in the local framework, indirectly impacting the workforce.

For instance, to promote the local manufacture, the ARE 2019 has proposed to remove the tax exemptions from the import of REP based consumer items. This measure has been taken to promote local content in contrast to Pakistan's earlier import trends. Pakistan imported³³ almost 95% of renewables products, mainly from China which had cost cheaper than what Pakistan manufacture locally. This proposal to remove tax exemptions must be notified after examining the standard of locally produced products and local production capacity to meet the demand. Any arbitrary declaration on removing tax exemptions on the imports of REP may be detrimental to renewable energy growth.

ARE Pakistan has required AEDB³⁴ to set up an institution for training and research relating to renewables. Pakistan Council of Renewable Energy Technologies has also been established³⁵ as a statutory body to research and develop renewable energy sources. However, no information about human resource training initiatives for renewable industries' skill is publicly available in Pakistan.

The State Bank of Pakistan issued³⁶ a financing scheme for renewables in 2016 that focused on the financing of renewables at a subsidised interest rate of 6% per annum. The latest statistics about the amount of investment by this scheme are not accessible. Furthermore, the indirect financial incentives' effect of these indirect sectoral measures upon the workforce's just transition at a larger scale is yet to be investigated.

4 Conclusion

Pakistan has adopted the policies and laws for renewables in the energy sectors. The market reforms in the electricity industry have largely influenced ARE 2019. However, these measures in their current form are insufficient to respond to climate change issues. The *de-facto* suspension of FiT Regulations in Pakistan reflects the seriousness with which the Government views these issues.

Besides de-incentivising renewables energy, Pakistan has also subjected the on-grid procurement under the control of the IGCEP. This de-incentivisation and entry controlled by IGCEP also make the sector less attractive for potential investment in renewables. Pakistan unresolved commercial issues also seem to be a barrier to the renewables' successful harnessing.

³³ Imran Mukhtar, 'Energy-short Pakistan moves to power up solar manufacturing' (*UK Reuters*, 2019) <<https://uk.reuters.com/article/us-pakistan-renewables-taxes/energy-short-pakistan-moves-to-power-up-solar-manufacturing-idUSKCN1PN0UX>> accessed 22 Jan 2020

³⁴ Pakistan, 'Alternative & Renewable Energy Policy, 2019'

³⁵ The Pakistan Council of Renewable Energy Technologies, 2018, sec 3

³⁶ State Bank of Pakistan, 'Revised SBP Financing Scheme for Renewable Energy' (*SBP*, 2016) <<https://www.sbp.org.pk/sme/d/circulars/2016/C3.htm>> accessed 22 Jan 2021

The issues concerning the system constraints for transmission in Pakistan and other implementation issues would also play a significant role in any measures concerning renewables. However, Pakistan current position about renewables and its prevalent energy mix would require substantial efforts to meet its CO² targets.

ARE 2019 also lack the clear perspective to deal with the workforce's just transition engaged in the current economy, as pointed by COP21. The policy does not mention any clear principles and guidelines of just transition proposed by the International Labour Organisation. The official data concerning the other steps (if any) for training, re-skilling, and up-skilling of the workforce in the fossil fuel sector is publicly inaccessible to accurately determine the impact of these policies on the energy transition based on renewables.

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