Socio-technical Inertia: Understanding the Barriers to Distributed Generation in Pakistan

Naila Saleh,[a] and Paul Upham[b]

1. Motivations underlying the research

Pakistan is the sixth most populous country in the world and its centralized energy sector remains confronted with multiple challenges—characterized by heavy reliance on fossil fuels, extensive inefficiencies in terms of corruption and excessive losses, and cyclical financial arrears (NEPRA 2020; Ichord Robert. F 2020). Pakistan also is the fourth largest electricity access deficit country, where 61 million people still have no access to electricity and the remainder have unreliable access to power supply (IEA et al. 2020; NEPRA 2020). Against this context, decentralized renewable energy configurations have the potential to unleash myriad benefits for the country— not only offering an alternative for end-users frustrated with dependencies on the failing centralized energy systems, but also an option for mitigating the causes of climate change. Distributed generation solar PV (DG solar) offers considerable benefits for a more versatile and efficient supply system.

In a bid to promote small scale distributed indigenous renewable energy resources, Pakistan launched net-metering regulations in 2015 (NEPRA 2015). These regulations allowed for on-site solar and wind generation. As per the regulations any category type consumers i.e., residential, industrial, commercial, and agricultural, having three-phase connection can avail net-metering facility for system sizes ranging between 1kW to 1MW (AEDB 2017). Once licenses are issued, the distributed generators are compensated at off-peak retail tariff; whereas cash compensations in case of positive net-balance are made after every three months (AEDB 2017; NEPRA 2015). Yet despite the launching of this facility and high electricity tariffs in Pakistan, adoption of DG solar has remained insignificant overtime in Pakistan. This study probes some of the reasons for this.

2. A short account of the research performed

In a bid to promote renewable energy, Pakistan issued net-metering regulations in 2015 that allowed for on-site solar and wind generation. However, five years on, overall growth in Distributed Generation (DG) remains insignificant. Here we investigate the reasons why, focusing on solar prosumage and exploring the key barriers and challenges in the existing socio-technical regime. The paper draws on document analysis; the views of key stakeholders including distributed solar PV adopters; end-users who have not yet adopted solar prosumage; the electricity distribution companies who are primary intermediaries responsible for implementing the regulations and connecting the end-users to the grid; commercial banks financing solar PV; and relevant authorities. We identify the obstacles to solar prosumage as including: difficulties in acquiring finance (especially in the case of smaller systems); under-facilitation of net-metering by electricity distribution companies, including an absence of Fee for Service models such as third-party investors; an awareness gap (especially on net-metering facility); and fragmented governance and regulations. We conclude that to succeed in the context of

a Rural Development Policy Institute, Islamabad, Pakistan. Technical University Berlin, and Agora EW, Berlin, Germany. Email: naila.saleh@agora-energiewende.de.

b Sussex Energy Group, University of Sussex, UK.

prevailing conditions, realistic implementation action plans based on the alignment of institutional coordination and cooperation, finance, and business model solutions, mandated and backed by significant national and regional policy level support, remain critical.

3. Main conclusions and policy implications of the work

In this study we investigated several barriers at multiple-levels relating to the transition to a sustainable DG system in Pakistan, drawing on questionnaire surveys and interviews with primary stakeholders in the socio-technical regime. In the next phase of the study, drawing on a neo-institutional framework of types of logic and mechanism – we characterize these obstacles to uptake of distributed PV in Pakistan, as well as observed inertia and resistance among key, incumbent actors as a problem of misaligned institutional logics.

The larger objective of the study is to inform debate of appropriate responses regarding how to support DG deployment and create an enabling environment that better suits the needs of prosumers. Based on these insights, we propose that the Pakistan government should place an increased emphasis on DG and set explicit targets for rooftop solar in its policies. Further, a proper mechanism needs to be designed, wherein the institutional barriers are addressed and DISCO relationships with distributed generators are subjected to scrutiny by an unbiased third party, which could be the regulator itself. The financial impediments both in terms of wide-scale adoption of 'SBP Financing Scheme for Renewable Energy', as well as difficulties in acquiring loans from banks, needs to be effectively addressed. In parallel, enabling regulations should be legislated to allow private sector engagement in driving rooftop solar and DG growth. The findings of the study thus imply a need for addressing the barriers in relation to 'solar PV financing', as well as 'enabling regulations for corporate solar PPA/leasing models', both of which are particularly important for DG dissemination.