

Present status, road blocks and future of net metering in Pakistan

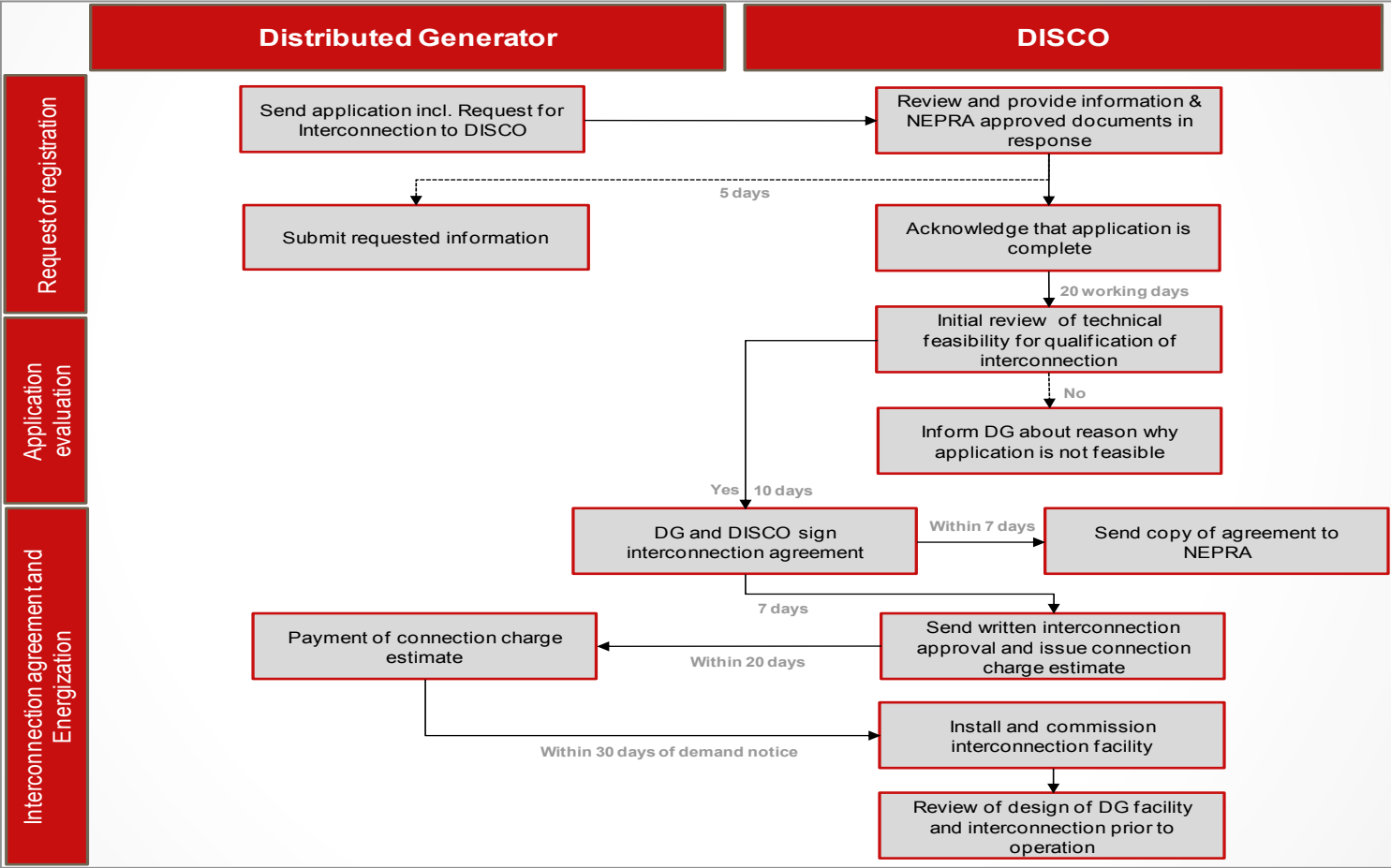
WORKSHOP ON NET METERING

November 28, 2016

Existing Regulatory Environment for Net Metering in Pakistan

- NEPRA has approved Regulations on September 1, 2015 to put into effect Net Metering for solar and wind generation of up to 1MW.
- Net metering regime is allowed to customers with a three-phase electricity connection
- This allows monetary benefits to consumers by offsetting at least a part of their power bills by generating electricity.
- The procedure for net metering is comprised of five steps including:
 - 1) submission of application by the consumer,
 - 2) technical review of application by DISCO,
 - 3) signing of net metering agreement,
 - 4) payment of interconnection charges by the consumer,
 - 5) sale/purchase of electricity.

Application process



Existing Regulatory Environment for Net Metering in Pakistan

- A meter capable of recording power flows in both directions (**bi-directional meter**) will be used.
- Use of two separate meters to measure inflow and outflow of electricity is also allowed
- The balance of units is going to be taken care of after every 3 months.
- The Regulations also outlines operational process for both generators and distribution companies

Current Status of Net Metering

- **AEDB** with the support of **International Donors** initiated business case development and roll out of net metering in Pakistan
- **First expert mission** in this regard in Nov, 2015; **Stakeholder Workshop** was conducted.
- **Second Expert Mission** in this regard held in February 2016
- **Third Expert Mission** in this regard being held in April 2016
- Participants: NEPRA, DISCOs & representatives from private sector.
- AEDB with the help of GIZ developed a **Business cases** for consumers and a detailed **Roadmap** for the promotion of Net Metering
- In February 2016, the Parliament Building has gone green with installation of **1 MW solar PV plant**;

Current Status of Net Metering

- DCRP is pursuing promotion of Net Metering all over Pakistan
- DCRP has decided:
 - Solar PV systems upto 10 kW size would be allowed net metering as per procedures without system studies
 - DISCOs are directed to analyze their systems to determine how much RE Net Metering can be done at their systems
 - DISCOs to Establish dedicated cells for Net Metering
 - Acceptance of single phase PV inverters for small DG facility of up to 5kW

Current Status of Net Metering

- Energy Department Government of Punjab has prepared a draft SOPs for the guidance of DISCOs and Electrical Inspectors.
- **IESCO with REAP** is also installing 3 kW solar PV system at its own facility on net metering basis.
- IESCO has taken lead to develop **Standard Operating Procedures (SOPs)** to process all such applications; DCRP has circulated draft SOPs for all DISCOs.
- 14 customers of cumulative 1527.8 kW including **National Assembly (1MW)**, **Pakistan Engineering Council (178 kW)** and **Pakistan Planning Commission (178 kW)**

Current Status of Net Metering

- **IESCO with REAP** has also installed 3 kW solar PV system at its own facility on net metering basis.
- DISCOs also has received a number of applications from domestic consumers for allowing net metering.
- Draft **Guidelines** on Net Metering for the consumers and the DISCOs has been prepared by AEDB
- **Training Program** was arranged by REAP and AEDB to discuss procedural and technical aspects of Net Metering

Barriers in Promotion of Net Metering and Prospective Solutions

Sr. No.	Barrier	Prospective Solution
1.	Distribution Code amendment required for people & grid safety	<ul style="list-style-type: none"> • Make needed Distribution code addendum through Distribution Code Review Panel (DCRP) and get it approved from NEPRA. • AEDB has shared first draft of the addendum with DISCOs in DCRP meeting and once finalized, the same will be submitted to NEPRA for approval.
2.	SOPs for DISCOs need to be finalized	<ul style="list-style-type: none"> • DISCOs may finalize SOPs for Distributed Generation Net Metering.
3.	Bi-directional meter Specifications need to be approved	<ul style="list-style-type: none"> • NTDCL to approve and issue design specifications for bi-directional meters for net metering. • AEDB has already sent a request to NTDCL, however, the matter needs to be finalized.

Barriers in Promotion of Net Metering and Prospective Solutions

Sr. No.	Barrier	Prospective Solution
4.	Changes in the NEPRA Net metering Regulations to address concerns of the DISCOs and make them more pragmatic.	<ul style="list-style-type: none"> • Changes in NEPRA Regulations are being proposed to effect inputs of DISCOs and private sector stakeholders. • NEPRA to consider proposed changes.
5.	Insurance for Distributed Generators for Net Metering	<ul style="list-style-type: none"> • Approach insurance companies on 3rd party insurance for Distributed Generators Units. • AEDB is in discussion with bilaterals to effect this.
6.	Quality and Safety Standards of Equipment	<ul style="list-style-type: none"> • Implement quality and safety standards for equipment used by Distributed Generators to prevent human or infrastructure damage. • The Addendum to Distribution Code as submitted to DCRP has specified standards for Inverters..

Barriers in Promotion of Net Metering and Prospective Solutions

Sr. No.	Barrier	Prospective Solution
6.	Quality and Safety Standards of Equipment	<ul style="list-style-type: none"> • matter has been taken up with Ministry of Science & Technology to enforce quality standards for Solar PV equipment to ensure import/availability of quality products only. • for system larger then 50kW, proper grid studies should be undertaken by DISCOs for grid stability. • For system larger then 250 kW, DISCO can opt for 3rd party consultants to carry out system studies.
7.	Capacity Building of Relevant Officials in DISCOs	<p>Develop specifications and human capacity to</p> <ul style="list-style-type: none"> • process Net Metering requests, certify the equipment and verify installation as per Regulations. • ensure safety during operations (this is simpler

Further proposed Net Metering Promotional Activities

- Conduct a train-the-trainer program for DISCO staff to train field and technical staff.
- Define the marketing material, target group and multipliers for the awareness campaign on net metering.
- Establish dedicated net metering units within the distribution companies to help bundling net metering knowledge and centrally addressing all capability bottlenecks at the distribution company level.

Future Targets for Net Metering

- At least 1,000 MW RE installation through net metering by 2022.
- Encourage 3-phase customers in domestic, commercial and industrial sector to opt for net metering.
- Work with donors and financiers to develop financing schemes for distributed generation including net metering.

Net Metering Economic Benefits

System	Residential	Commercial	Industrial
System Size	10 kW	50kW	500kW
Battery Capacity	5kWh	-	-
System Cost (USD)	16,650	67,000	602,000
Saving USD/a	1,800	8,300	82,100
Payback (years)	10.1	6.9	6.00

- Uninterrupted power for the residential consumer
- Lower line losses on the DISCOs network
- Decrease in power outages

Safety Standards: Inverters

Grid Tied Solar Inverters	Grid Interconnection Requirements
UL 1741: Inverter, Converters, Controllers and Interconnection System Equipment for use with distributed Energy Resources (the U.S)	IEEE 1547: Standard for Interconnecting Distributed Resources with Electric Power Systems (India and the U.S.)
IEC 62109-1/2: Safety of Power Converters for use in Photovoltaic Power Systems –General/ Particular Requirements (India & the EU)	IEC 61727: Photovoltaic (PV) Systems Characteristics of the Utility Interface (India)
IEC 61000-6-2/4: Electromagnetic compatibility (EMC) (India & the EU)	

Safety Standards: PV equipment

PV equipment	
IEC 61730-1/2 : PV module safety qualification (India & EU)	IEC 60947-3:2008 + A1:2012 : Low-voltage switchgear and control gear (India & EU)
UL 1703 : safety and product requirements of PV modules (U.S.)	UL 703 : safety and product requirements of PV wire
IEC 61439-1:2011 : Low-voltage switchgear and control-gear assemblies (India & EU)	EN 50618 : Electric cables for photovoltaic systems (IEC standard under development)

Thank You

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