

With the support of the PV Market Alliance

The PV Market Alliance



APVIA Q2 2018 Market Report



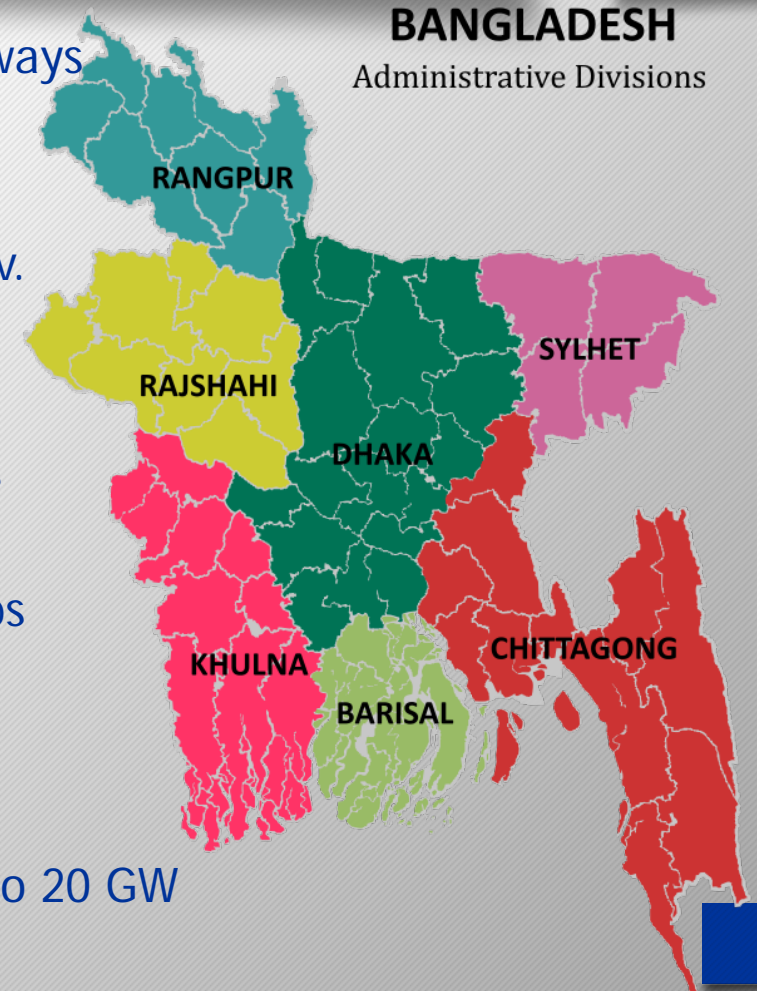
Introduction



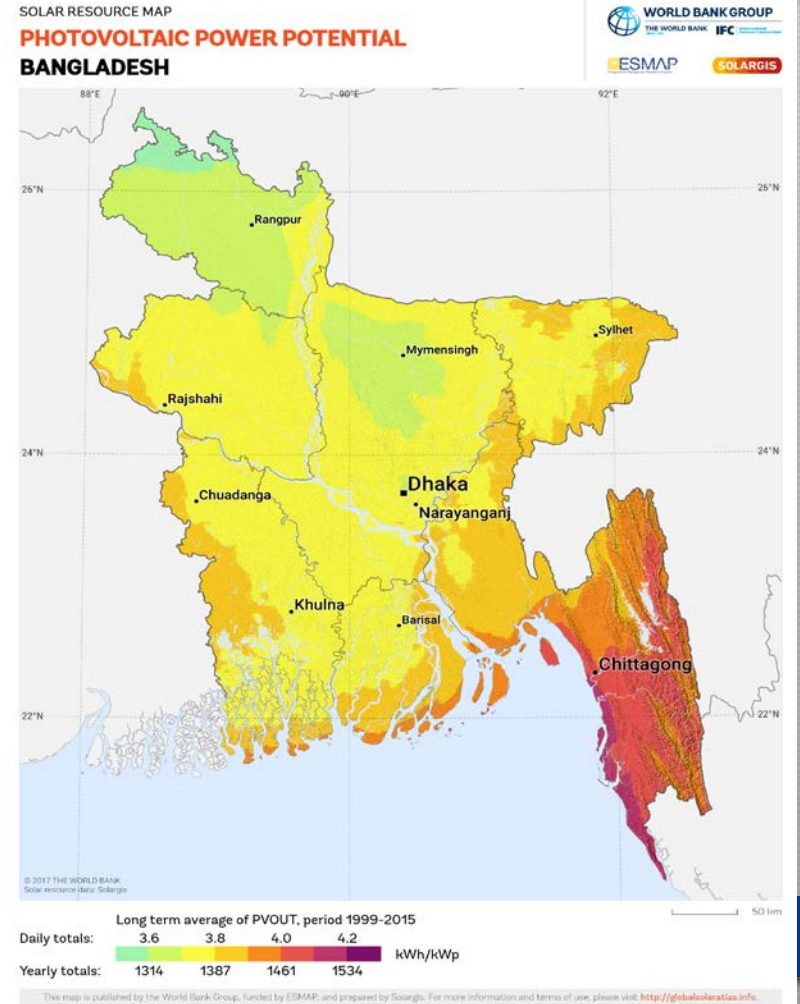
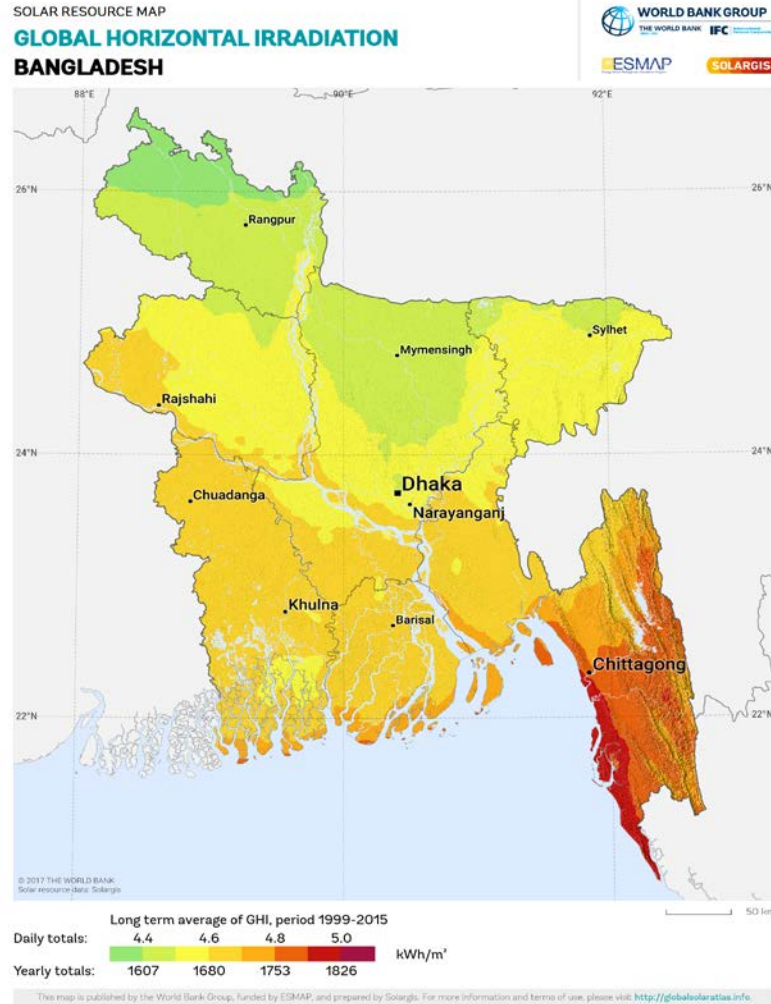
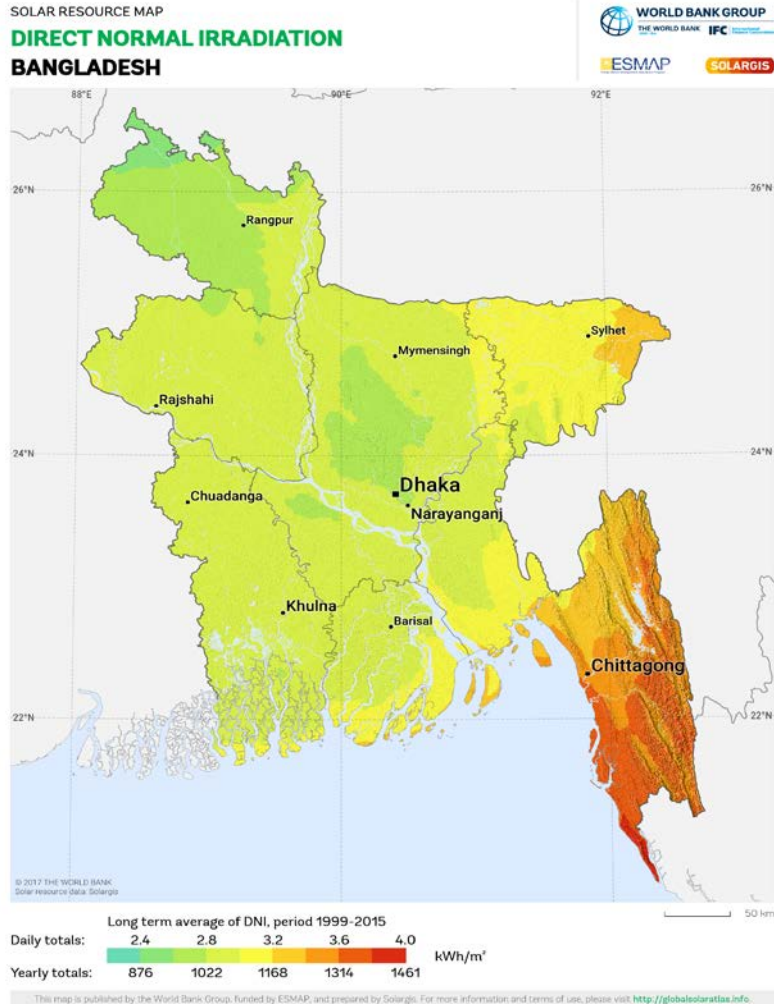
- Launched in 2017, this 6th edition of APVIA's quarterly PV market report focus on "Bangladesh and Pakistan", anticipated to witness solid growth in 2018 / 2019 and beyond
- This report focuses on "Bangladesh and Pakistan" the importance of renewable energy in its energy mix in general as well highlights and trends regarding solar PV in particular
- This report has been prepared with information provided by the PV Market Alliance and especially Asia Europe Clean Energy (Solar) Advisory Co. Ltd. (AECEA)
- All information collected are valid at the time of publication. The data published do not engage the responsibility of APVIA or AECEA and should be considered with all due caution and are for informational purposes only

Bangladesh – Country Snapshot

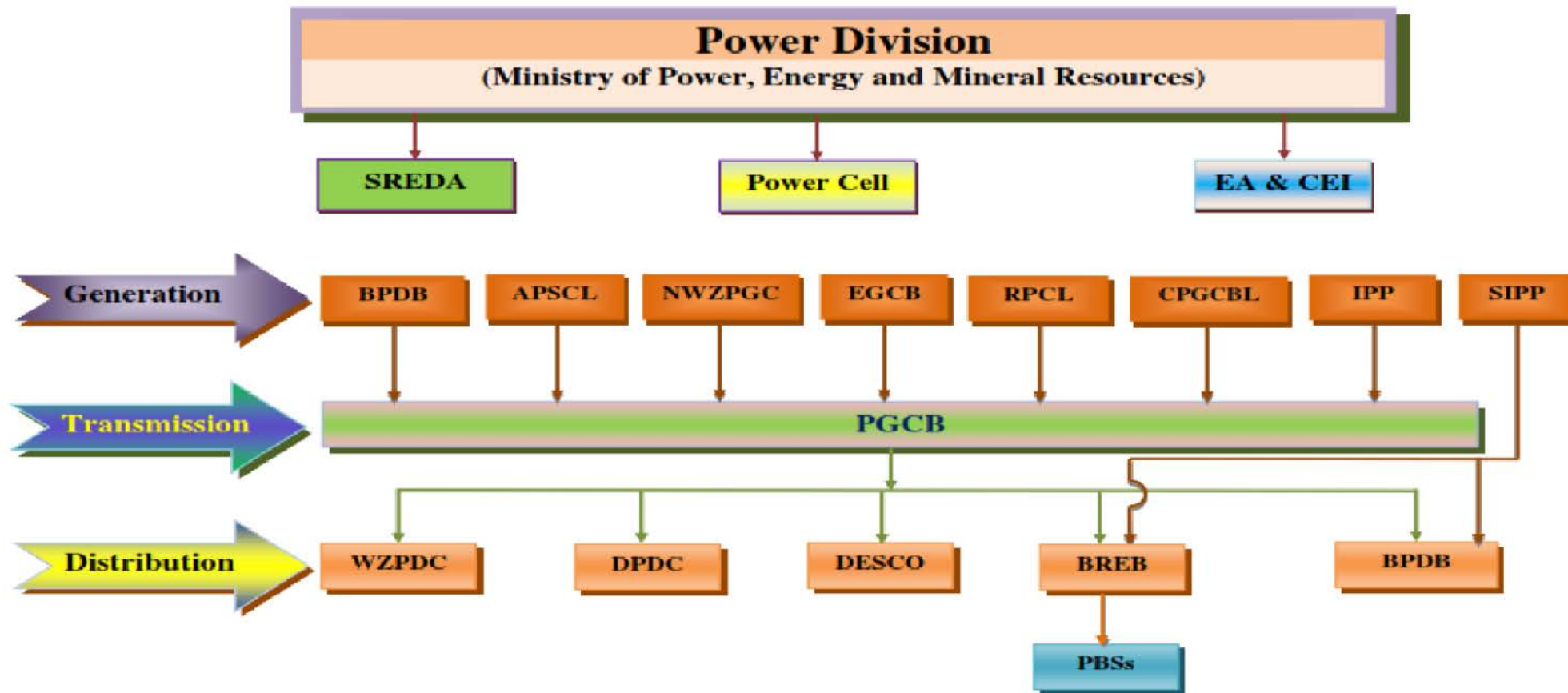
- Land mass 147,570 km²; 700 rivers and 8,046 km of inland waterways
- Population approx. 162 Mio (2016) est. to reach 240 Mio by 2041
- 3rd largest South Asian Economy (after India and Pakistan)
- Insufficient power supply is a significant obstacle to economic dev.
- Current installed electrical power capacity amounts to 16046 MW made up 48% (public sector), 38% (private), 14% (captive power)
- 56 percent of the country's electricity is generated by natural gas
- Per capita power consumption 433 kWh (2017)
- Globally, 5th regarding the number of renewable energy green jobs
- Solar irradiation varies from 3.8 kWh/m²/day to 6.4 kWh/m²/day to an average of 5 kWh/m²/day
- Renewable Energy Policy: 10% of total electrical power by 2020
- By 2020, total installed power generation capacity shall amount to 20 GW



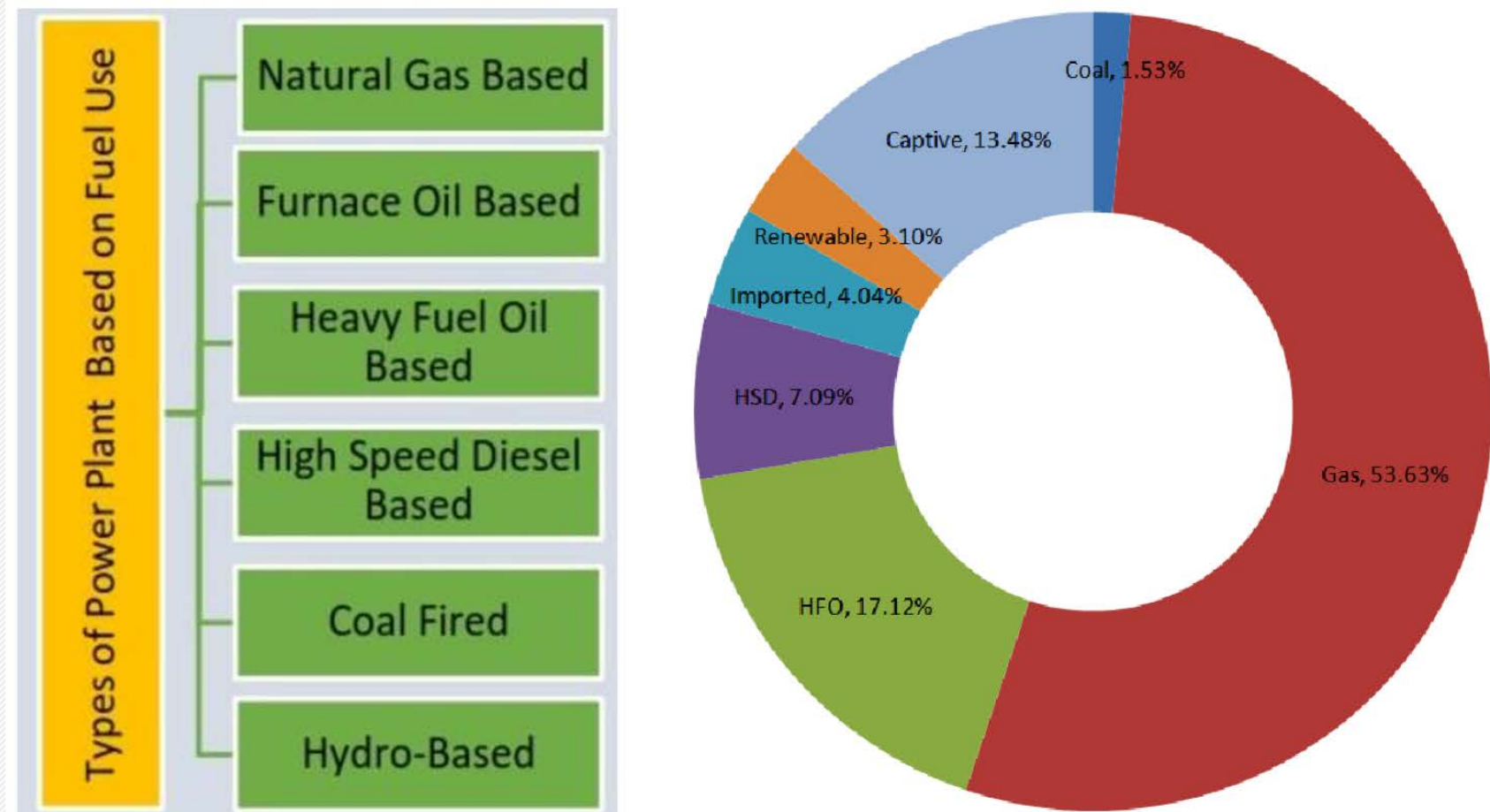
Direct Normal Irradiation Map Bangladesh - Global Horizontal Irradiation Map Photovoltaic Power Potential Map



Bangladesh - Power Sector (Institutional Structure)



Bangladesh - Power Generation by Fuel (MW)



Source: Sustainable & Renewable Energy Development Authority of Bangladesh (2017)

Bangladesh – Solar Potential

- Solar power irrigation pumps could replace 1.3 Mio diesel gen-set operated pumps
- Utilizing solar power irrigation pumps, possibly up to 10 GWh of electricity could be generated
- Solar power mini-grids on island and remote areas
- Solar powered arsenic treatment plants (approx. 20 Mio are directly affected by arsenic) and a single plant can produce 4000-8000 liters of arsenic free water; 2500 of such plants are being planned to be installed in future
- Community based solar, e.g. 125,000 primary schools could accommodate approx. 1250 MW, a further 67,000 secondary schools + 30,000 colleges / universities could witness the installation of approx. 970 MW. 53,000 madrasahs + 300,000 mosques have potential for approx. 1 GW for primarily rooftop systems
- To date approx. 3 MW of utility-scale solar is operational, however 800 MW have been approved by the government to be connected to the national grid line
- Net-metering policy of rooftop solar is currently under preparation
- Floating solar PV, currently the country with support from the ADB plans a 50 MW system

Bangladesh – Renewable Energy Policy (1)



- Effective since 2008
- Harness the potential of renewable energy resources and dissemination of renewable energy technologies in rural, semi-urban and urban areas
- Enable, encourage and facilitate both public and private sector investment in renewable energy projects
- Develop sustainable energy supplies to substitute indigenous non-renewable energy supplies
- Scale up contributions of renewable energy to electricity production
- Scale up contributions of renewable energy both to electricity and to heat energy
- Promote appropriate, efficient and environment friendly use of renewable energy
- Facilitate the use of renewable energy at every level of energy usage
- Create enabling environment and legal support to encourage the use of renewable energy
- Promote development of local technology in the field of renewable energy

Bangladesh – Renewable Energy Policy (2)

- Renewable Energy Goals for Bangladesh
- The Government of Bangladesh has set a target to have 3,168 MW of renewable energy capacity installed by 2021
- 5% share of RE in electricity generation by the end 2015 and 10% by 2021
- Focus on solar and wind technology
- Addition of 1,740 MW of solar power by 2021
- Addition 1,370 MW of wind energy capacity by 2021
- The remaining balance (58 MW) to be made up of biomass-based power generation technologies (47 MW); biogas (7 MW) and mini-hydro power projects (4 MW)
- About 1,055 MW will be added through state-owned companies
- 2113 MW will be installed by private sector companies

Bangladesh – Renewable Energy Policy (3)

- RE Goal for Bangladesh in Rural Areas
- Providing 1 million rural consumers with solar home systems by 2012
- The continued decline in solar module costs, the high cost of transmission and distribution infrastructure due to the many rivers that crisscross the country, and the persistently high costs of diesel for power generation and of other fossil fuels used for lighting such as kerosene, has made Solar Home Systems the most competitive tool to increase electricity access in rural Bangladesh
- 100% renewable first-time electricity for 6 million households by 2017
- 100% electricity access to rural areas by 2021

Bangladesh - Status of RE Development (06/2018)

Solar Home System(SHS)	250 MW (installed over 5 million units)
Roof Top Solar System	30 MW
Solar Irrigation	25 MW
Solar Mini grid	5 MW
Wind	2.9 MW
Biomass & Biogas based Electricity	6.5 MW
Hydro	230 MW
Total	549.4 MW

Source: Bangladesh Solar & Renewable Energy Association

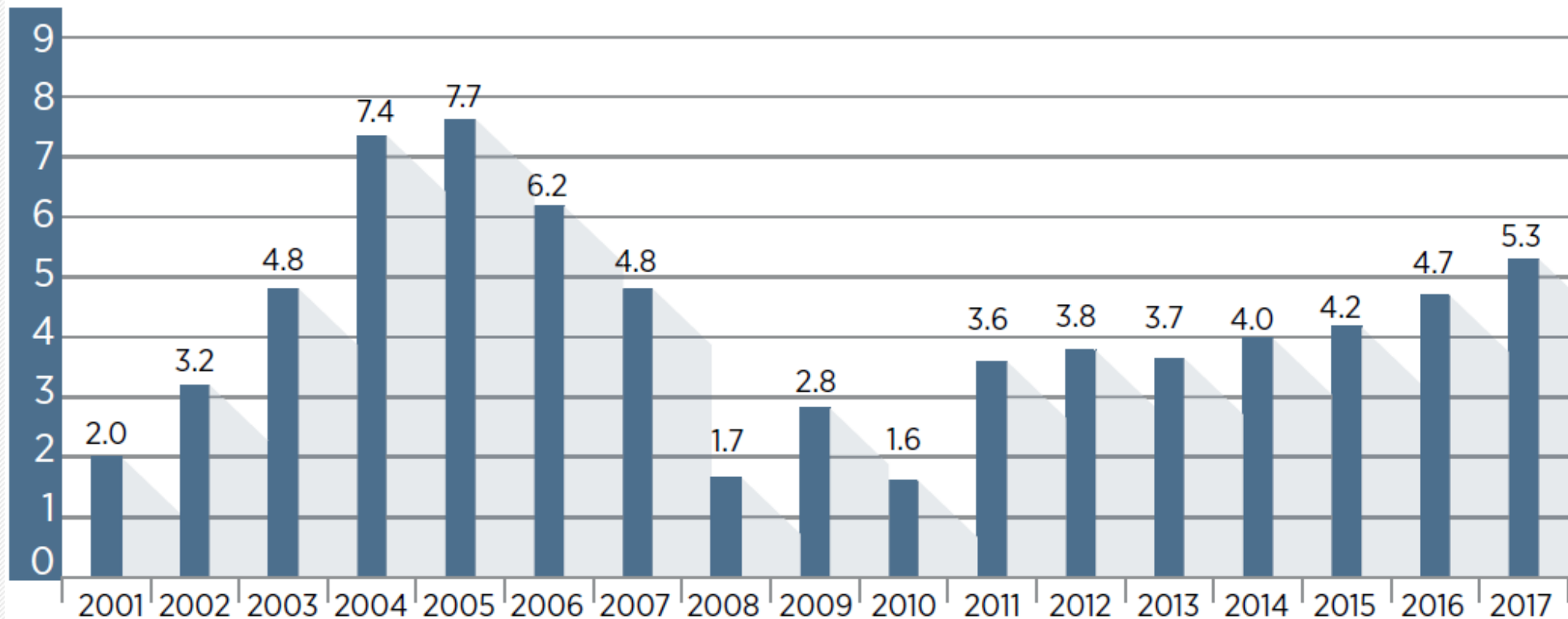
Pakistan – Country Snapshot

- Land mass $\approx 881,913 \text{ km}^2$; $\approx 144 \text{ Mio}$ no reliable access to electricity; $\approx 56 \text{ Mio}$ (2013) no access
- Population $\approx 199 \text{ Mio}$ (2015e); 6th most populous nation; 2030 est. $\approx 244 \text{ Mio}$
- 2016-2020 GDP growth rate est. $\approx 5\%/a$; 2% GDP/a lost due to power cuts
- 2015 total power gen.-cap. $\approx 23,6 \text{ GW} = 60\%$ thermal, 5% nuclear, 5% hydro, 30% others incl. oil
- Installed capacity of alternative and renewable energy sources in the power sector has already risen from 0.2% in 2013 to 5.2% of total installed capacity in 2018
- Since 2006 National Policy for Development of Renewable Energy Generation
- Feed-in-Tariffs (FIT) for 1-20 MW/20-50 MW/50-100 MW are in the range btw. US Cents 10.8 to 11.3/kWh
- Current FIT are granted for 25 years, according to the Alternative Energy Development Board of Pakistan (AEDB)
- Sept 2015 net-metering scheme for projects under 1 MW came into effect



Pakistan - GDP Growth Rates (2000-2017)

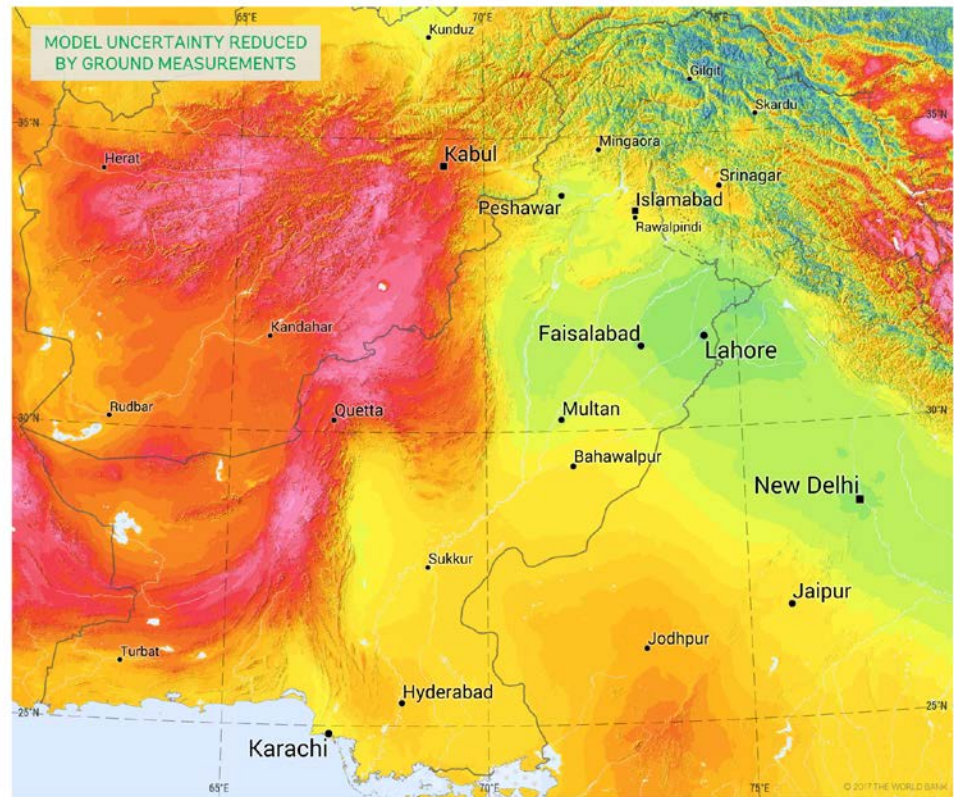
Figure 1. Annual GDP growth rate (FY 2001 to FY 2017)



Based on Ministry of Finance, 2017

Pakistan - Direct Normal Irradiation Map

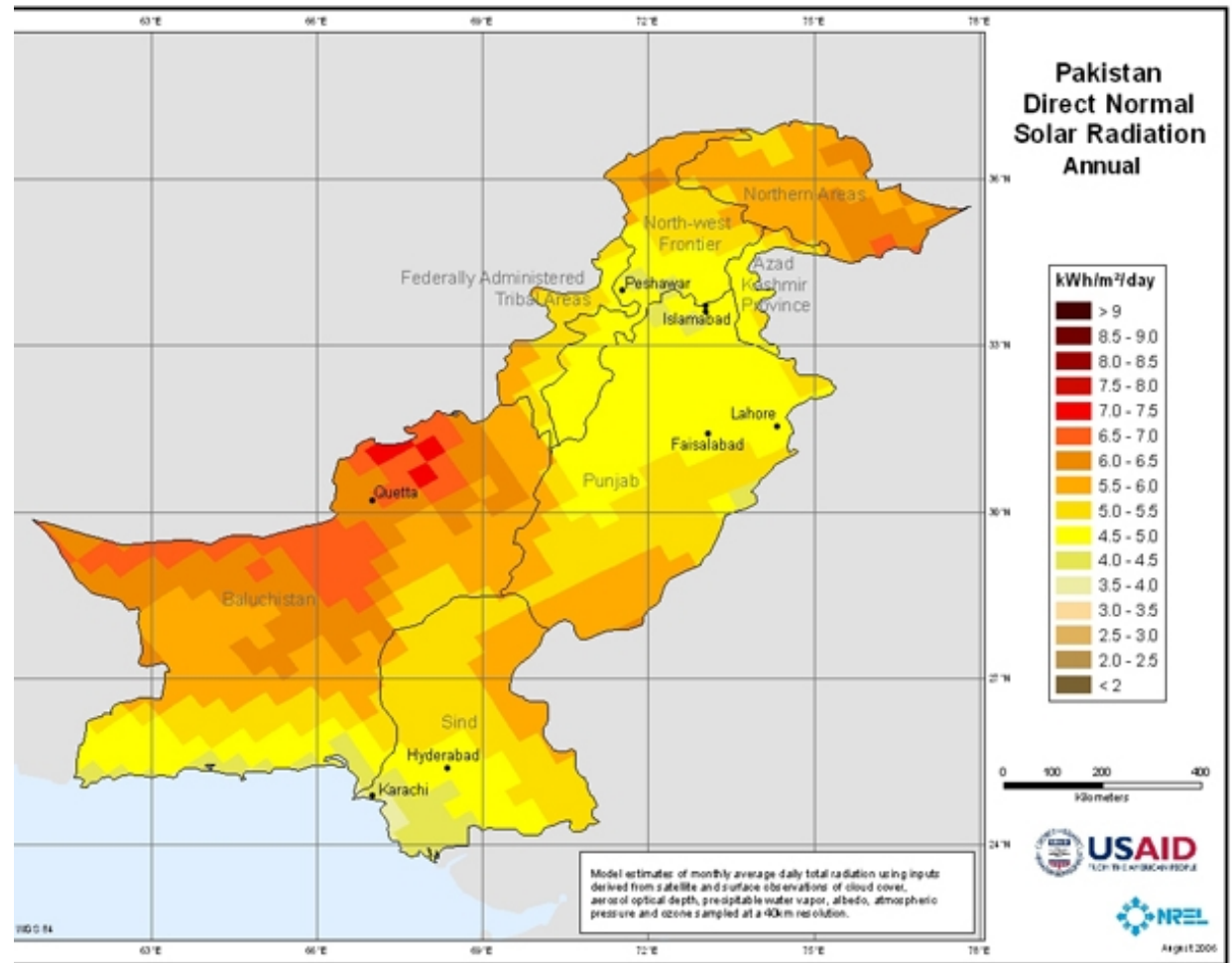
SOLAR RESOURCE MAP DIRECT NORMAL IRRADIATION



Long-term average of daily/yearly sum, period 1999-2016

Daily sum:	< 2.6	3.0	3.4	3.8	4.2	4.6	5.0	5.4	5.8	6.2	6.6	7.0	>
Yearly sum:	< 949	1095	1241	1387	1534	1680	1826	1972	2118	2264	2410	2556	>

Unit: kWh/m²



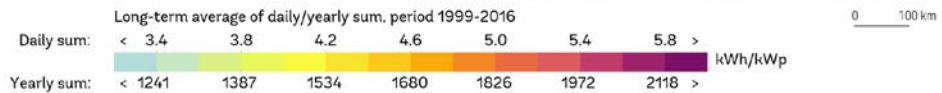
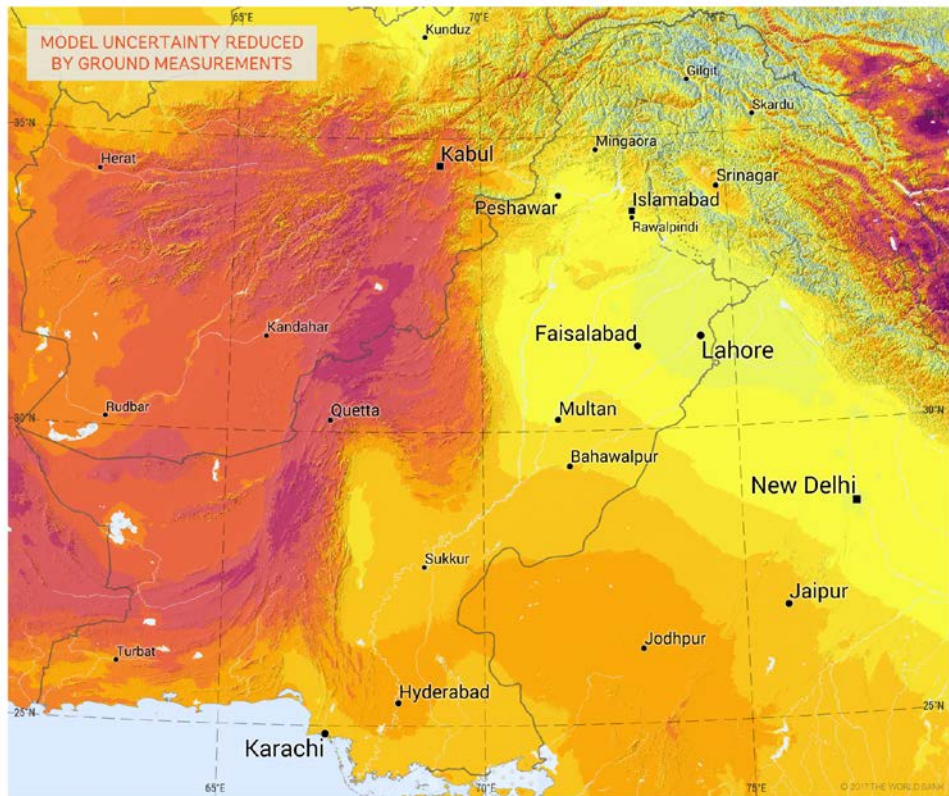
Model estimates of monthly average daily total radiation using inputs derived from satellite and surface observations of cloud cover, aerosol optical depth, precipitable water vapor, albedo, atmospheric pressure and ozone sampled at a 40km resolution.



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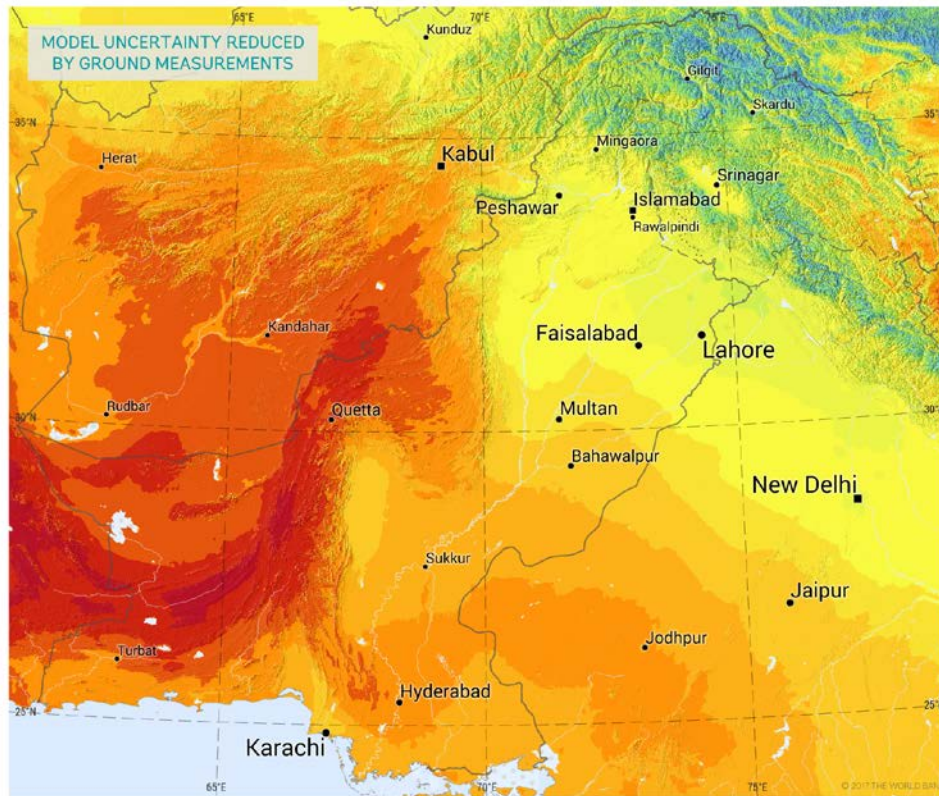
Pakistan - Global Horizontal Irradiation Map Photovoltaic Power Potential Map

SOLAR RESOURCE MAP
PHOTOVOLTAIC POWER POTENTIAL



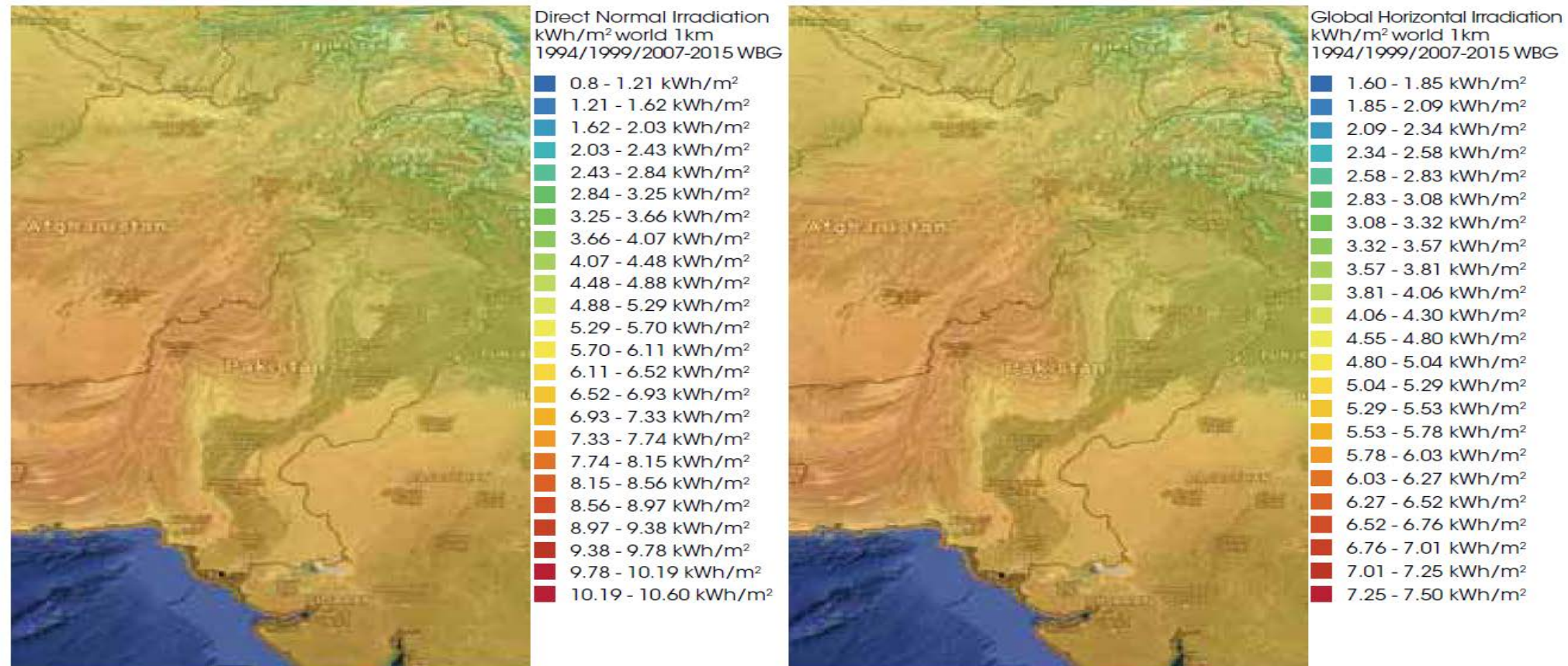
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SOLAR RESOURCE MAP
GLOBAL HORIZONTAL IRRADIATION



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Pakistan - Solar Energy Resource Map



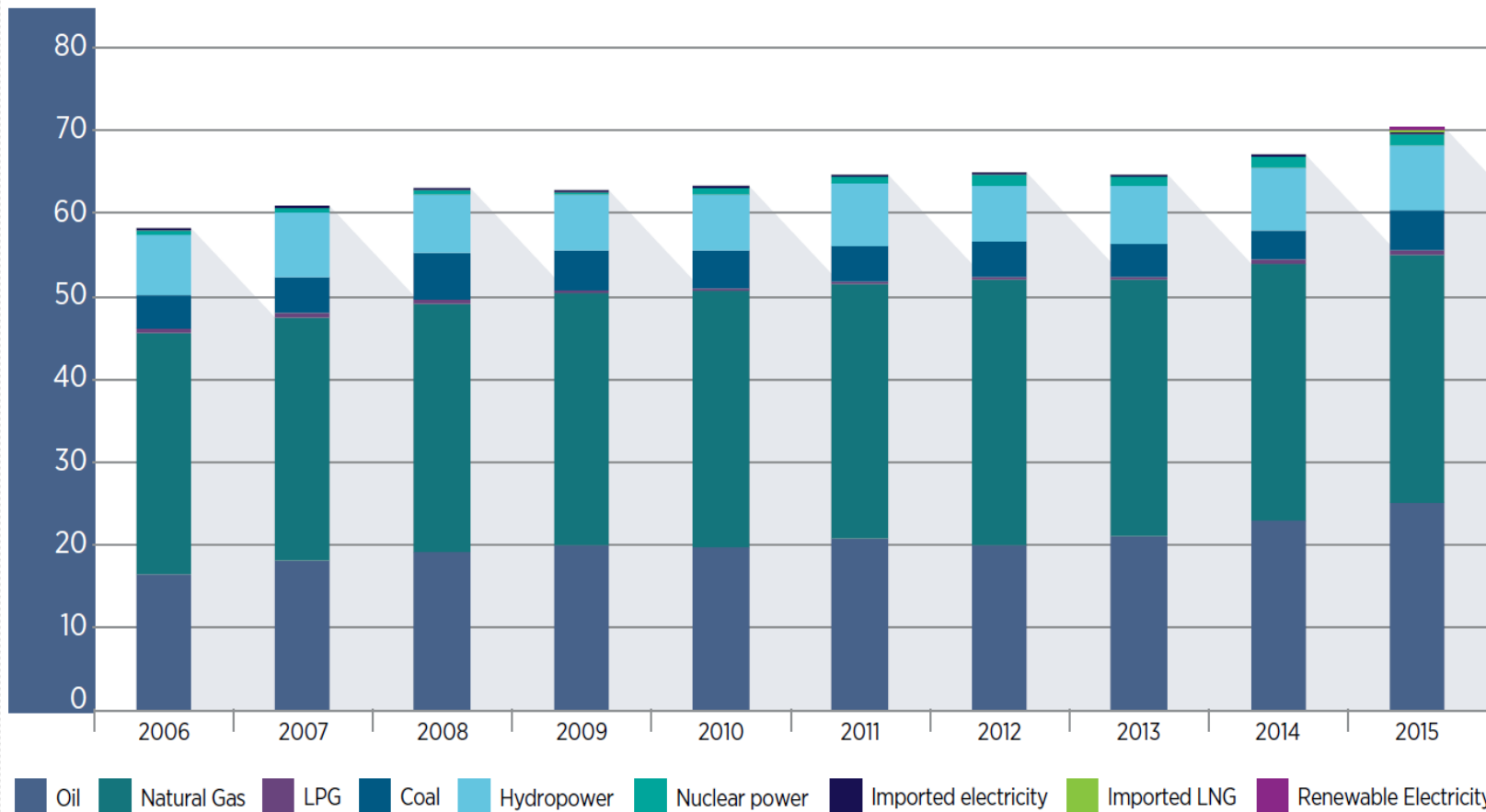
Notes: Left represents direct normal irradiance; right represents global horizontal irradiance.
 Source: IRENA (n.d.), *Global Atlas for Renewable Energy*, using data from World Bank-ESMAP.
 The boundaries and names shown on this map do not imply any official endorsement or acceptance by IRENA.

Pakistan – Power Generation Mix (Overview)

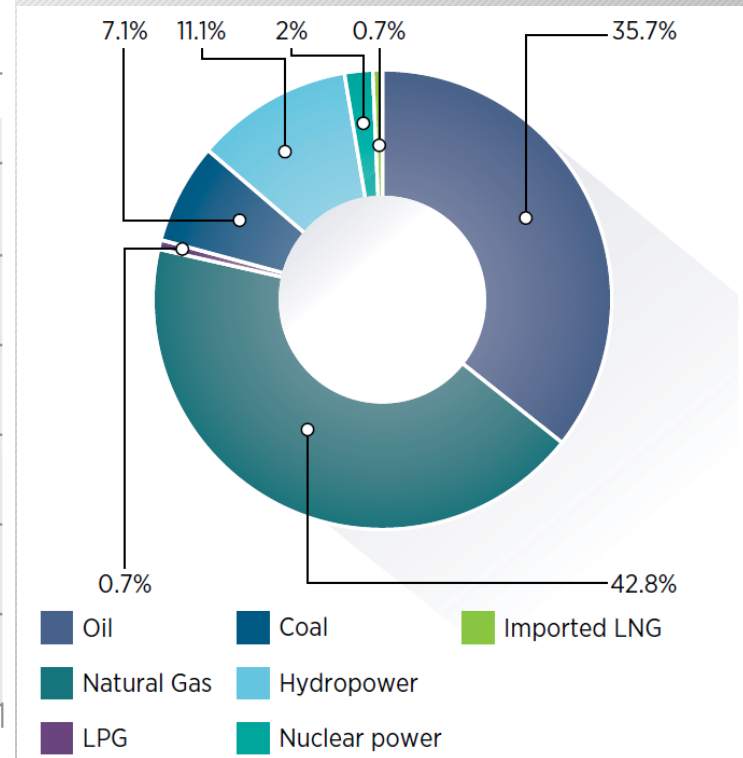
- Pakistan’s power generation mix is dominated by thermal power
- Share of renewable energy (excluding large hydropower above 50 MW) is less than 2%
- Solar & wind started to gain traction a few years ago, despite the obvious potential (natural endowment)
- The power shortage reached as much as 7 gigawatts (GW) in 2012, but has generally moved between 4 GW and 6 GW by 2018

Source	Installed Capacity (MW)	% of Installed Capacity	Generation (GWh)	% of Generation
Hydel	7,116	27.77%	34,272	29.05%
Furnace Oil/High Speed Diesel	5,707	22.27%	43,103	36.54%
Gas	11,023	43.01%	34,433	29.19%
Coal	150	0.59%	148	0.13%
Nuclear	787	3.07%	4,207	3.57%
Wind	306	1.19%	786	0.67%
Solar	400	1.56%	207	0.18%
Others	139	0.54%	807	0.68%
Total	25,628	100%	117,963	100%

Pakistan - Primary Energy Supply by Source



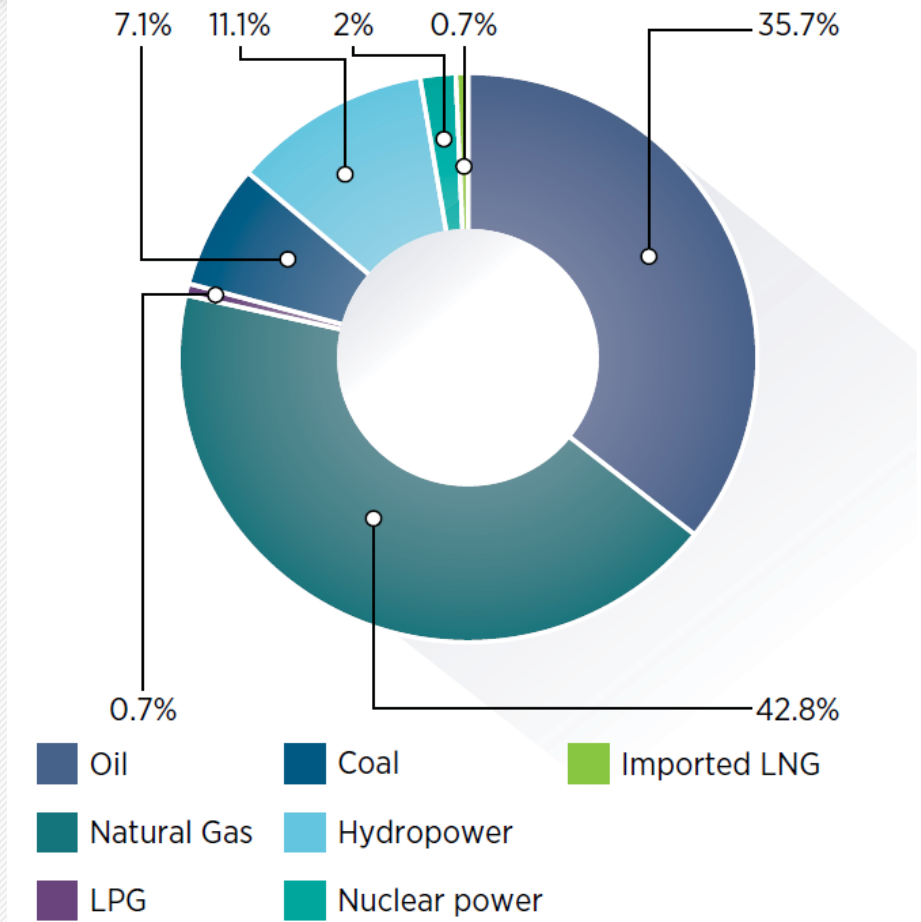
Based on Hydrocarbon Development Institute of Pakistan (2016)



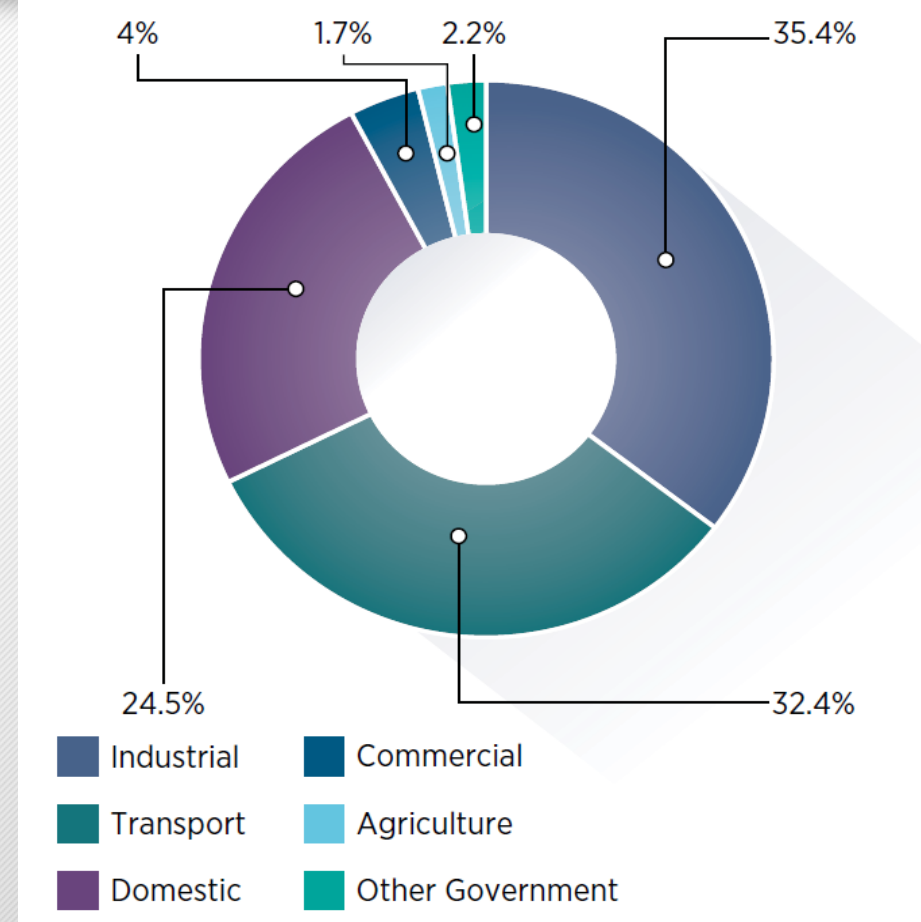
Source: Hydrocarbon Development Institute of Pakistan (2016)

Pakistan - Primary Energy Supply by Source

Final Energy Supply by Source (right)

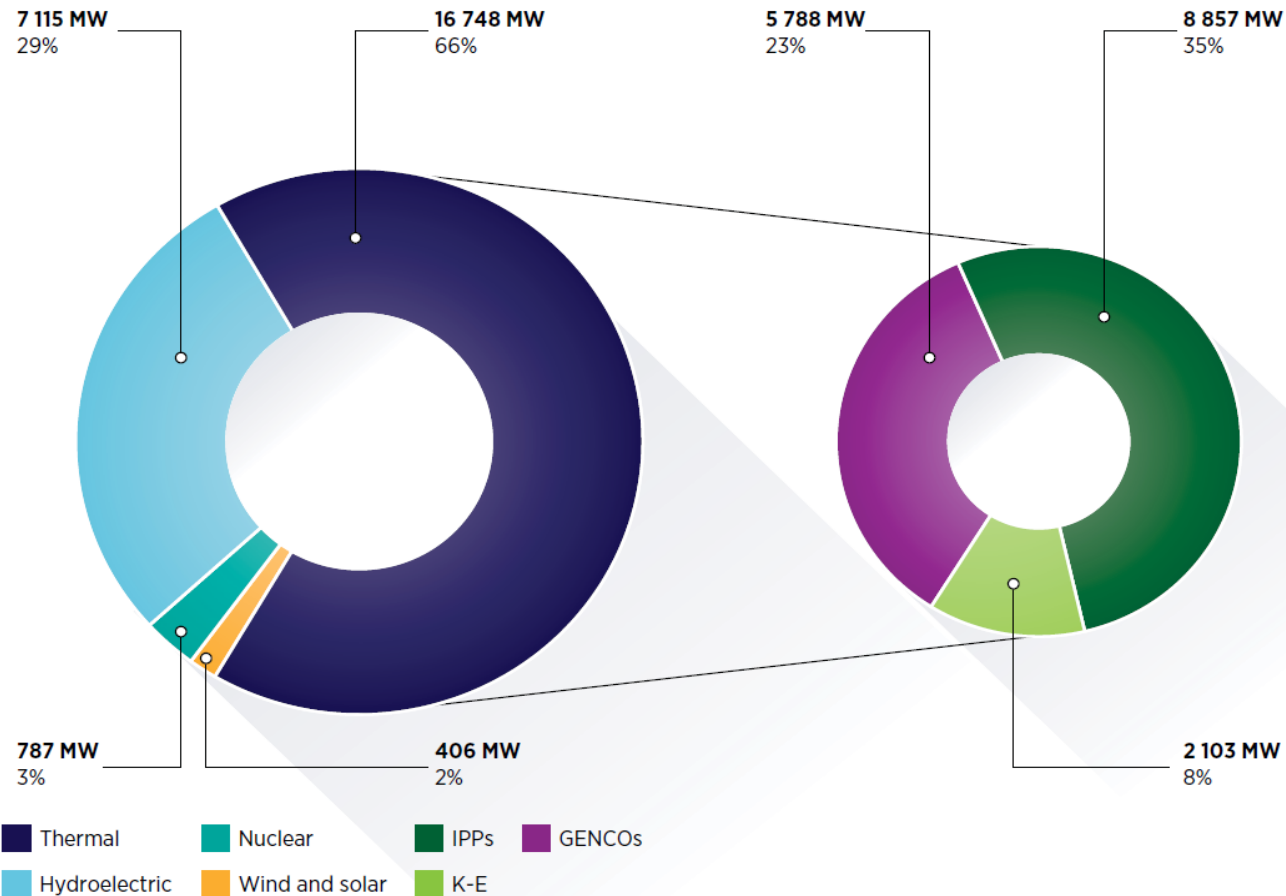


Source: Hydrocarbon Development Institute of Pakistan (2016)



Based on Hydrocarbon Development Institute of Pakistan (2016)

Pakistan - Share of Installed Power Generation Capacity by Source (12/2015)



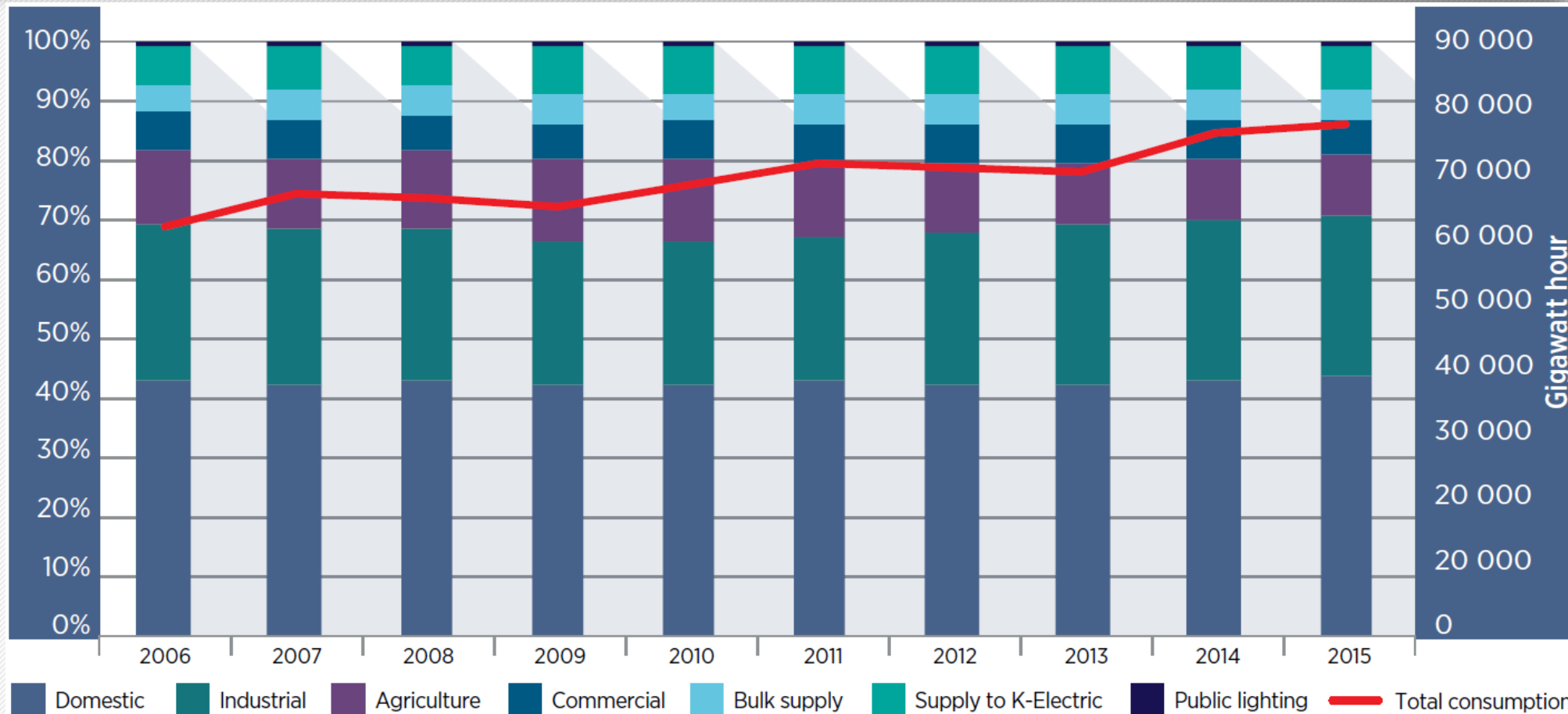
Based on NTDC (2015a), *Power Systems Statistics 2014-15*
 Note: GENCOS = state-owned generation companies

Pakistan - Power Deficit at Peak Hours (2006-2016)

FY	Installed capacity (MW)	Maximum generation capability (MW)	Demand during peak hours (MW)	Deficit (MW)
2006	19 550	15 168	15 223	-55
2007	19 681	15 575	17 487	-1 912
2008	20 232	14 707	19 281	-4 574
2009	20 556	16 040	20 314	-4 274
2010	21 614	15 144	21 029	-5 885
2011	23 342	15 430	21 086	-5 656
2012	23 487	15 896	22 654	-6 758
2013	23 725	16 846	21 605	-4 759
2014	23 702	18 771	23 505	-4 734
2015	24 961	19 132	24 757	-5 625
2016	25 374	20 121	25 754	-5 633

Sources: NEPRA (2015a) *State of Industry Report 2014*; NEPRA (2016a), *State of Industry Report 2015*

Pakistan - Power Consumption by Sector (2006-2015)



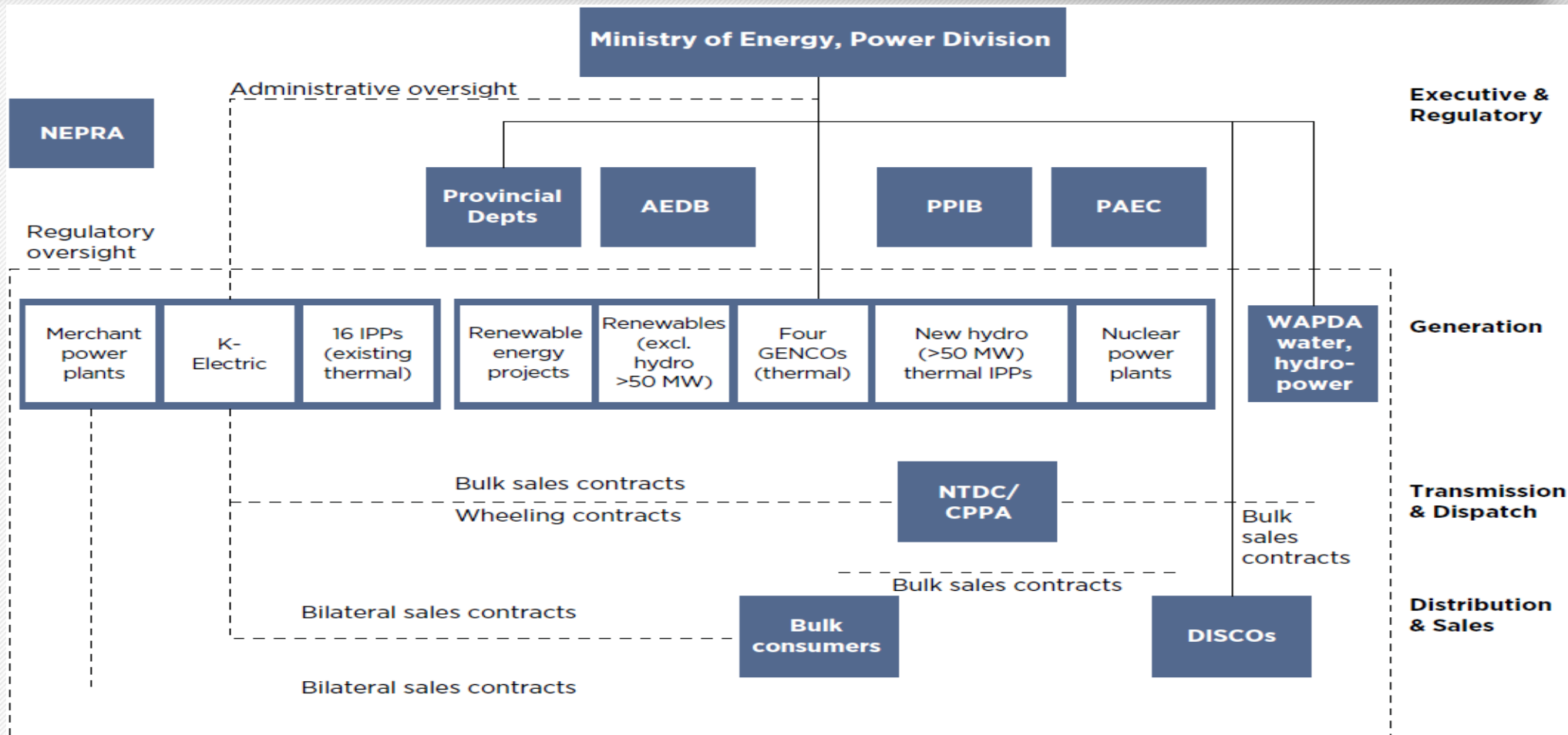
Based on NEPRA *State of Industry* reports, 2014 and 2015

Pakistan - Electricity (2017-2020) Demand & Supply Projections

FY	Capacity addition per year (MW)	Total installed capacity (MW)	NTDC peak demand (MW)
2017	2 585	27 959	27 175
2018	8 422	36 381	28 668
2019	1 656	38 037	30 138
2020	5 422	43 459	31 619

Source: NEPRA (2016a), *State of Industry Report 2015*

Pakistan - Power Sector (Institutional Structure)



Pakistan - Key Power Sector Institutions (1)

Organisation	Type	Roles and responsibilities
Power Division, Federal Ministry of Energy	Federal ministry division	The executive arm of the Government of Pakistan for all issues pertaining to power generation, transmission, distribution, pricing, regulation and consumption. Co-ordinates and plans the nation's electricity sector; formulates policy and specific incentives. Liaises with provincial governments and has oversight for all line agencies and autonomous bodies.
NEPRA	Regulator	Independent regulator with a mandate to ensure transparent, competitive and commercially oriented power market operations including generation, transmission and distribution. Issues generation, transmission and distribution licences, and determines tariffs for the power sector.
PPIB	Agency	A "one-window" facilitator on behalf of the federal government to promote private-sector participation in the power sector for large hydropower and non-renewable technologies.
AEDB	Agency	Autonomous body under the Ministry of Energy with the mandate to promote and facilitate exploitation of renewable energy resources. Develops national strategies, drafts policies and plans for utilisation and promotion of renewable energy. Co-ordinates and facilitates commercial application of renewable energy technologies as well as facilitating private investors. Forum for evaluation, monitoring and certification of renewable energy projects and products.
NTDC	State-owned public limited company	Responsible for all properties, rights, assets, obligations and liabilities of the 220 kV and 500 kV grid stations and transmission lines and networks.

Pakistan - Key Power Sector Institutions (2)

CPPA (Guarantee)	State-owned limited guarantee	Responsible for power procurement from generation companies, hydropower and IPPs on behalf of DISCOs for delivery through 500 kV, 220 kV and 132 kV networks. Performs power market clearing function.
Power utilities (DISCOs)	State-owned companies	Ten separate electricity retail companies responsible for administering the O&M, supply, distribution, construction and expansion of the 132 kV and 11 kV grid network within their respective areas of jurisdiction.
K-Electric	Private power utility company	Responsible for generation, transmission and distribution of electric power for the city of Karachi.
Provincial energy departments	Provincial government departments	Four provincial energy departments (Punjab, Sindh, Khyber Pakhtunkhwa and Baluchistan) and the AJK Power Development Organization support energy project implementation within their respective regions. Responsibilities include liaising with the federal government to implement policies and measures to incentivise energy project development.
WAPDA	Agency	Responsible for large-scale hydropower project development and water sector projects.
Generation companies	State-owned companies	Government-owned but independently operated companies responsible for O&M of public-sector thermal power plants.
PEPCO	State-owned company	Established in 2007 to manage the transition of government entities from a bureaucratic structure to a corporate, commercially viable entity. It is responsible for the management of all the affairs of the corporatised nine DISCOs, four generation companies (GENCOs) and NTDC, all of whom are working under an independent Board of Directors

Pakistan - 2030 Renewable Energy Targets

- Pakistan introduced a comprehensive renewable energy policy in 2006, making private investment in the sector commercially viable
- Pakistan aims at adding a minimum 9700 MW of renewable energy power generation capacities by 2030
- Pakistan's solar energy potential has been estimated to amount to approx. 2900 GW
- Global Horizontal Irradiance (GHI) values over 4.5 kWh/m²/day covering over 90% of the country's land area
- Values of just over 6.4 kWh/m²/day are reached in the southwestern region of Baluchistan decreasing gradually towards the northeast of the country to 4.0 kWh/m²/day

Pakistan – Solar PV Development (06/2018)

- 27 Projects of 954 MW are at various stages of development within the framework of AEDB policies and procedures
- 6 projects with a combined capacity of 430 MW are operational
- 5 projects (42 MW) are anticipated to achieve financial closure soon
- 13 projects (421 MW) are at different stages, commercial operation date (COD) expected 2019/2019
- 43 projects (approx. 3,300 MW) initiated by provinces e.g. Punjab has issued eight letters of intent for 1419 MW, Sindh has issued 17 letters of intent for 1200 MW and Khyber Pakhtunkhwa has issued one letter of intent for a 50 MW project, are at different stages
- Competitive bidding to be carried out for new solar projects
- **Distributed Solar PV**
- Net Metering initiated in Punjab and is in the process of being implemented in other provinces
- Solar power for un-electrified schools and basic health units
- Solar Home Systems for households in remote villages
- Conversion of agricultural tube wells to solar power

Pakistan – Net-Metering (03/2018)

- NEPRA (National Electric Power Regulatory Authority) approved regulations allowing net-metering for solar (up to 1 MW) from Sept 1, 2015
- Prime Minister of Pakistan launched a new consumer friendly framework for net-metering in January 1, 2018
- 242 customers of cumulative 6126 MW capacity have been issued a “Generation License for net-metering
- Additional 4-5 GW of net-metered based solar PV capacity are anticipated to be realized during the next 3-4 years till 2021/2022

Pakistan - Generation Tariffs for Solar PV IPPs

- Variable Cost Component (Local and Foreign)
- Fixed Cost Component (Local and Foreign)
- Insurance Cost Component
- Return on Equity Component
- Debt Repayment Component
- Interest Expense Component
- Generation Tariff for Solar PV based IPPs is structured on 'Take & Pay Basis'
A power pricing mechanism, also known as Single Part Tariff, comprises ...
- Generation Tariff, in terms of Pakistan Rupee (PKRs./kWh), linked with Net Electrical Output actually dispatched or made available for dispatch by the Power Producer during a specified time period; and ...
- Dispatch of the plant on a "Must Run" basis

Pakistan – IPPs (Security Package/Framework)

- Energy Purchase Agreement (EPA)
- Current Regime – EPA with NTDC/CPPA explicitly
- Revised Regime (under consideration) – Tri-partite EPA; specifying IPP, CPPA and NTDC as parties
- Implementation Agreement (IA)
- IPPs enter into IA with Government of Pakistan through AEB
- IA, inter alia, also guarantees payment obligations of NTDC (National Transmission & Dispatch
- Company)/CPPA (Central Power Purchasing Agency)

Pakistan – Solar PV Upfront Tariff

- To determine the upfront tariff of solar PV power generation, NEPRA has divided Pakistan into two zones based on solar irradiance. A higher tariff is applied to northern Pakistan, where irradiance levels are lower and consequently the capacity factor is 17%. By contrast, it is 18% in southern Pakistan (Baluchistan, Sindh and Southern Punjab)
- In case annual power generation exceeds these benchmarks, NEPRA has structured a mechanism for sharing excess revenue with the power purchaser

Capacity factor (north/south)	% of tariff chargeable
Above 17%/18% to 18%/19%	80%
Above 18%/19% to 19%/20%	90%
Above 19%/20%	100%

Pakistan - Solar PV Upfront Tariff (2016)

Solar PV upfront tariff – north (US cents/kWh)				Indexations
Category	> 1 ≤ 20 MW	> 20 ≤ 50 MW	> 50 ≤ 100 MW	
O&M	1.7823	1.7826	1.7823	CPI, US CPI, PKR/USD
Insurance	0.7483	0.7338	0.7194	Actual
Return on equity	3.7058	3.7054	3.7029	PKR/USD
Debt servicing (10 years foreign financing)	7.8242	7.7179	7.6100	PKR/USD, LIBOR/KIBOR
Total tariff (1–10 years)	14.0604	13.9394	13.8146	
Total tariff (11–25 years)	6.2363	6.2215	6.2046	
Levelised tariff	11.5327	11.446	11.356	
Solar PV upfront tariff – south (US cents/kWh)				Indexations
Category	> 1 ≤ 20 MW	> 20 ≤ 50 MW	> 50 ≤ 100 MW	
O&M	1.6832	1.6832	1.6832	CPI, US CPI, PKR/USD
Insurance	0.7067	0.6930	0.6795	Actual
Return on equity	3.4999	3.4995	3.4971	PKR/USD
Debt servicing (10 years foreign financing)	5.0022	4.9343	4.8652	PKR/USD, LIBOR/KIBOR
Total tariff (1–10 years)	13.2792	13.1650	13.0470	
Total tariff (11–25 years)	5.8898	5.8758	5.8598	
Levelised tariff	10.892	10.8101	10.7251	

Pakistan – Solar PV Tariff (Summary)

Technology	Tariff notification	Tariff validity period		Tariff (US cents/kWh)	
				North region	South region
Solar PV	January 2014	Duration: 25 years			
				17.01	16.31
	January 2015	Duration: 25 years	< 20 MW	15.02	14.41
			20-50 MW	14.89	14.28
			50-100 MW	14.76	14.15
	December 2015	Duration: 25 years	1-20 MW	11.53	10.89
			20-50 MW	11.45	10.81
			50-100 MW	11.36	10.73

Pakistan - Solar Projects (12/2017)

Serial No.	Name of project	Capacity (MW)	Location
1	M/s Quad-e-Azam Solar Power	100	Lal Sohanra
2	M/s Appolo Solar Pakistan	100	Lal Sohanra
3	M/s Crest Energy Pakistan	100	Lal Sohanra
4	M/s Best Green Energy Pakistan	100	Lal Sohanra

Serial No.	Name of project	Capacity (MW)	Location
1	M/s Access Electric Pvt.	10	Pind Dadan Khan
2	M/s Bukhsh Solar Pvt.	10	Bahawalpur
3	M/s Safe Solar Power Pvt.	10	Bahawalpur
4	M/s Access Solar Pvt.	11.52	Pind Dadan Khan
5	M/s Blue Star Hydel Pvt.	1	Pind Dadan Khan
6	M/s Harappa Solar Power Pvt.	18	Harappa, Sahiwal
7	M/s AJ Power Pvt.	12	Adhi Kot, Khushab

- AEDB is pursuing 28 solar power projects with a cumulative capacity of approximately 956.5 MW, and the following solar power projects, with combined capacity of 430 MW, have started commercial operations
- The following seven solar power projects with a cumulative capacity of 72.52 MW had obtained a letter of support from AEDB by December 2017

Pakistan - Jobs in the Solar Sector

	Residential	Commercial	Utility-scale	All
Installed capacity FY 2015 (MW)	-	-	-	600*
Value chain activities	Jobs (approximate) **			
Manufacturing***	400	200	100	600
Supply chain	1 000	500	100	1 600
Installations	4 000	1 600	300	5 900
Design	100	300	minimal	400
Business development	4 000	n/a	n/a	4 000
Project development	n/a	1 200	minimal	1 200
O&M	1 000	600	200	1 800
Total employment	10 500	4 400	700	15 500

* Based on IEA (2016b), *Snapshot of Global Photovoltaic Markets*.

** Based on employment factors defined in Engelmeier et al. (2014), "Beehives or elephants? How should India drive its solar transformation?"

Pakistan – Fiscal / Financial Incentives

- No customs duty or sales tax on import of equipment, machinery, spares
- No income tax / withholding tax / turnover tax
- Repatriation of equity along with dividends freely allowed
- Convertibility of PKR (Pakistan Rupee) into USD
- Non-Muslims and non-residents exempted from payment of Zakat on dividends
- Mandatory purchase of electricity by power purchaser
- Governments sovereign guarantee
- Issuance of corporate registered bonds permitted
- Issuance of shares at discounted prices allowed
- Foreign banks allowed to underwrite issuance of shares & bonds by IPPs
- Non-residents allowed to purchase securities issued by IPPs without permission of State Bank of Pakistan (SBP)
- Parties may raise local and foreign finance

Pakistan - Barriers & Constraints Perspectives Private Sector vs. Public Sector

Private Sector Perspective	Public Sector Perspective
Insufficient capacity of the grid to evacuate power from incoming power projects including renewable energy	Intermittent nature of the resource – need about 400-500 MW of spinning reserve
Frequent revisions of tariff by the regulatory authority	Ability of renewables to meet electricity demand of the country
Lack of coordination between government agencies	High tariffs awarded to renewable energy projects
Perceived bias, among most government officials, against renewables and in favor of coal and LNG projects.	

Pakistan - Barriers & Constraints (Public Sector Perspectives)

Government Agency	Identified Barrier(s)
Alternate Energy Development Board (AEDB)	Inadequate capacity of the grid and system operator to integrate variable renewable energy into the system
National Transmission and Despatch Company (NTDC)	Vulnerability of renewable energy to large fluctuations affecting grid reliability and security Insufficient financial resources to undertake the required grid reinforcement
Central Power Purchase Agency-Guarantee (CPPA-G), Planning Commission	High upfront tariffs awarded to solar and wind projects driving up generation costs

Pakistan - China-Pakistan Economic Cooperation Corridor (CPEC)

- April 21, 2015 - Xi Jinping on State Visit to Pakistan - project was announced
- Punjab Province - 900 MW under development by Zonergy (US\$ 1.5 bln) in 3 Phases each 300 MW
- Loan / equity ratio: 80% / 20%
- China's EXIM and China Development Bank are financing the project
- Tariff: USD Cents 14.1516/kWh
- To date approx. 300 MW operational



Pakistan - China-Pakistan Economic Cooperation Corridor (CPEC)



Pakistan - Local Developments - Sindh (2018)

- May 2018, the Government of Sindh Province in Pakistan rejected submissions from all four bidders in its tender for 352 solar PV systems to electrify primary health facilities
- The government of Sindh prepared a framework to address the potential environmental, resettlement, and social impacts associated with its major solar initiative, for which it is seeking World Bank funding
- March 2018, the Sindh Solar Energy Program (SSEP), a pioneering scheme in Pakistan, aims to support solar deployment in the province across utility-scale, distributed generation and residential segments. This includes up to 400MW of solar park capacity (50-200MW per park), starting with 50MW that will see the first tariff-based competitive auctions in Pakistan - the plans for which were announced December 2017
- The first 50MW site near Manjhand, Jamshoro District, has already been identified with land secured, and the aim is to complete this pilot solar auction by the end of 2018, allowing the project to be operational by 2020
- The program also aims for 15MW of distributed PV on rooftops of public sector buildings and others in the cities of Karachi and Hyderabad as well as a target of bringing solar home systems to a quarter of a million households in areas of Sindh with poor access to electricity

Pakistan – Local Developments – Sindh (2018)

- September 2017 the National Electric Power Authority (NEPRA) received tariff requests from project developers that just below 6 US cents per unit, already marking a major milestone for Pakistan’s solar ambitions, but NEPRA has come back with significantly lower determinations for these projects ranging from US cents 5.2622/kWh to 5.6073/kWh. The tariffs vary by project size to account for economies of scale and whether the land is privately purchased or allocated by the government
- February 2018, Pakistani coal and power firm, Sindh Engro Coal Mining Company (SECMC) has contracted Karachi-based solar EPC firm Reon Energy to build a 5MW PV project to help power its mining operations, in what will be a first for Pakistan
- Sindh Engro Coal Mining Company (SECMC) wants the project to be installed at its Tha Coal Block II in Sindh Province and it will become the largest private C&I solar plant for captive consumption in the country to date
- February 2018 the Pakistani regulator has issued its tariff determinations for 300MW of solar with tariffs significantly below grid parity
- June 2018, the World Bank announced to commit USD 100 mio of funding to support 400 MW of solar projects in Sindh Province

Courtesy



- Market data have been collected and analysed by members of the PV Market Alliance.
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The PV Market Alliance

