ELECTRICITY SECTOR IN PAKISTAN

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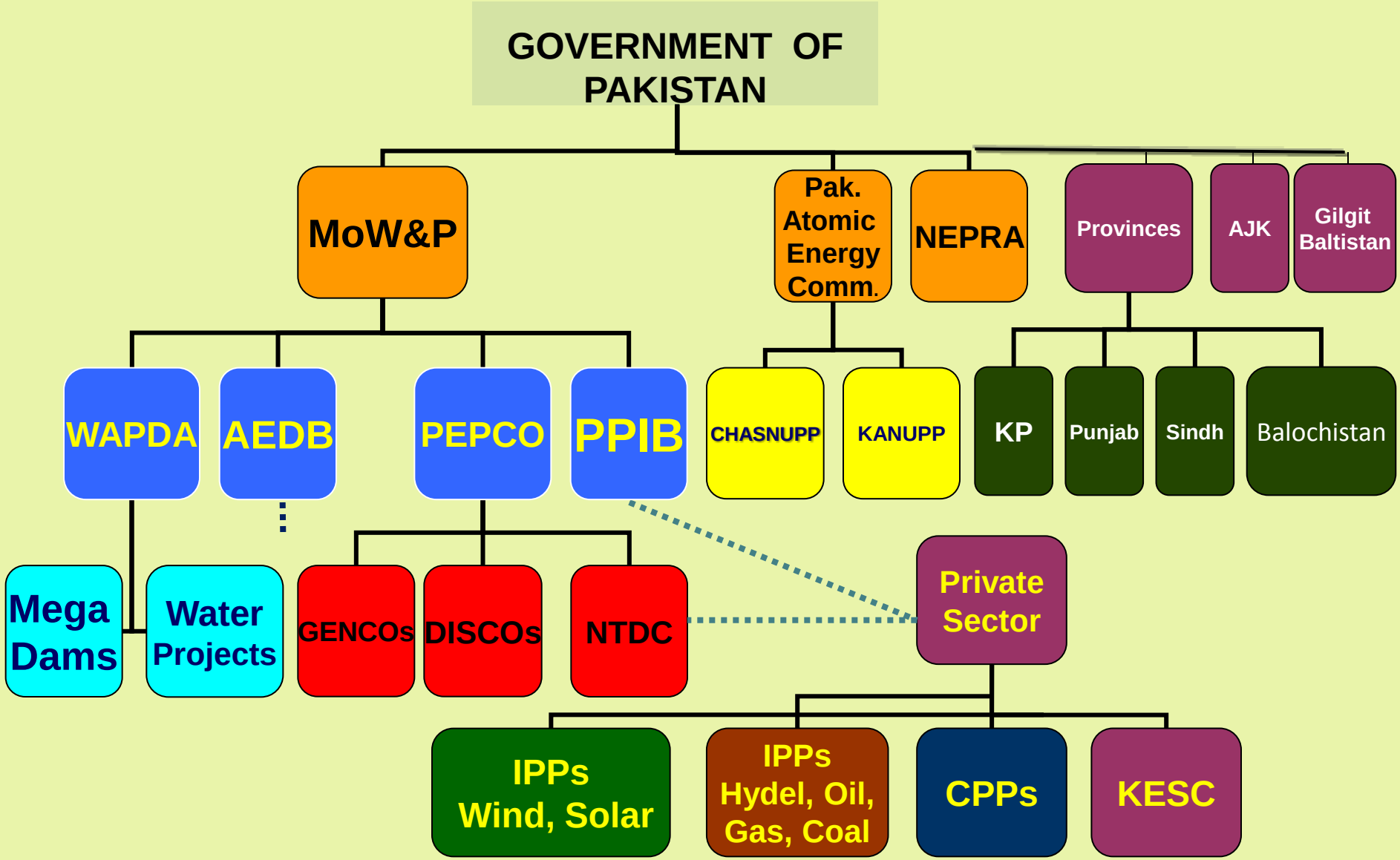
- Background
- Key Stakeholders
- Current Power Generation
- Power Sector Players
- Power Generation Expansion

PAKISTAN POWER SECTOR - TIMELINE JOURNEY

- Initially two vertically integrated utilities i.e. WAPDA and KESC, were responsible for generation, transmission and distribution in their areas

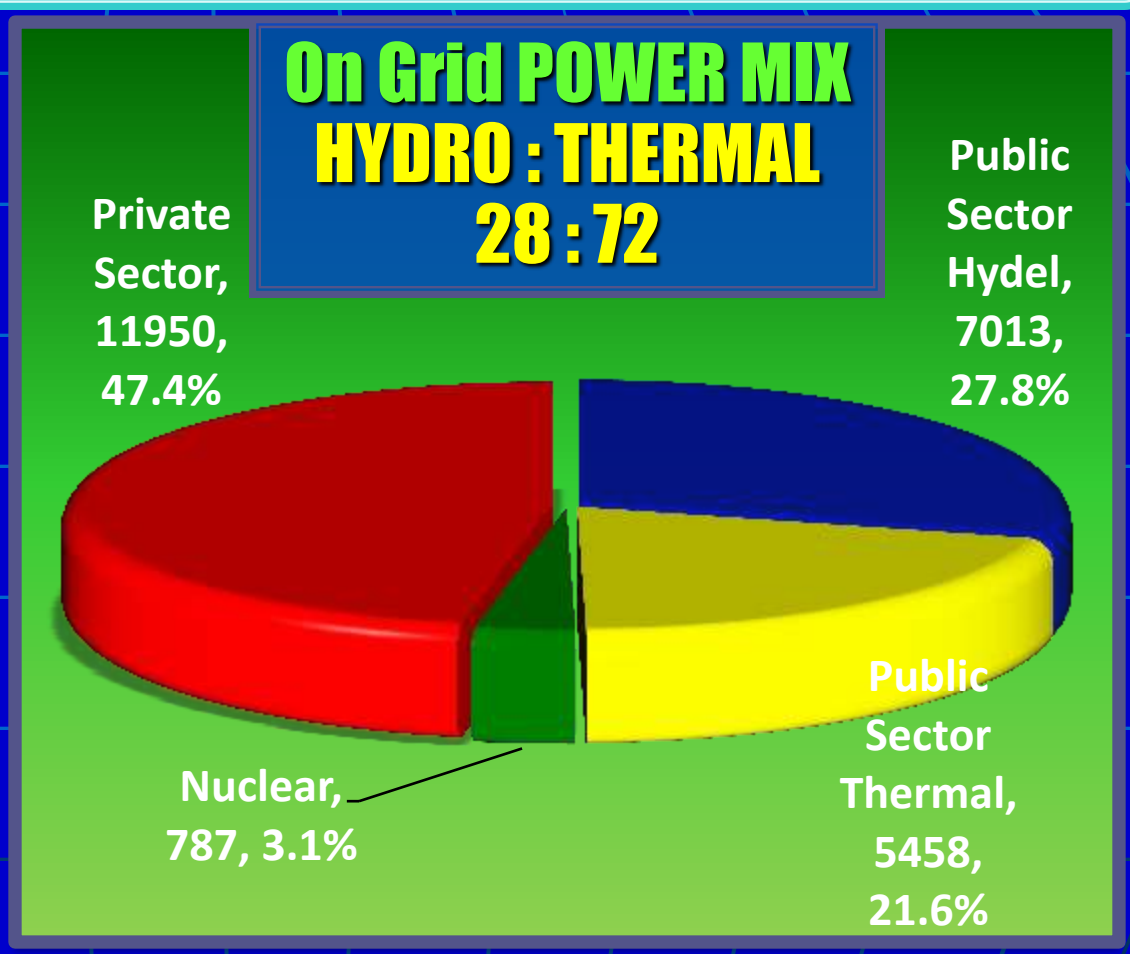
- **UPTO 70s:** KESC and WAPDA performed well
- **IN 80s:** Demand-Supply shortfall started
- **IN 90s:** Budget constraints. Involvement of private sector
- **1992:** Govt.'s strategic plan to reform Pakistan power sector
- **1993:** Power Policy 1994 formulated
- **1994:** Creation of PPIB & National Power Plan by WAPDA
- **1997:** Regulatory body NEPRA created
- **2001:** WAPDA Vision 2025 prepared
- **2002:** NEPRA issued a future plan for Pakistan Power Sector
- **2005:** Medium Term Development Framework prepared

PAKISTAN
POWER SECTOR – KEY PLAYERS



PAKISTAN POWER SECTOR - TOTAL INSTALLED CAPACITY

	MW	%
Public Sector		
Hydel	7,013	28
Thermal	5,458	22
Nuclear	787	3
Total	13,258	53
Private Sector		
IPPs	9,528	42
K-E	2,422	10
Total	11,950	52



Total Installed Capacity ***25,208*** *MW*

OVERVIEW OF PAKISTAN'S POWER SECTOR

- At present the following entities are responsible for delivery of power to the end consumers:
  - One Transmission and Dispatch Company
  - Ten Distribution Companies (DISCOs)
  - Four Public Sector Generation Companies
  - Thirty One (31) IPPs
- The Electricity Generation is blend of Hydel and Thermal Units.
- Total installed capacity is around 25,000 MW with 53% and 47% Share of Public and Private Sector respectively.

PAKISTAN POWER SECTOR
GENERATION

PUBLIC SECTOR		PRIVATE SECTOR
▸ WAPDA	Federal	▸ PPIB (Hydel, Coal, Gas, Oil) ▸ AEDB (Wind, Solar, Bio,)
▸ GoKP Province ▸ GoAJ&K ▸ GoPunjab	Provincial	▸ GoKP (Hydel) ▸ GoAJ&K (Hydel) ▸ GoPunjab (Hydel, Coal)

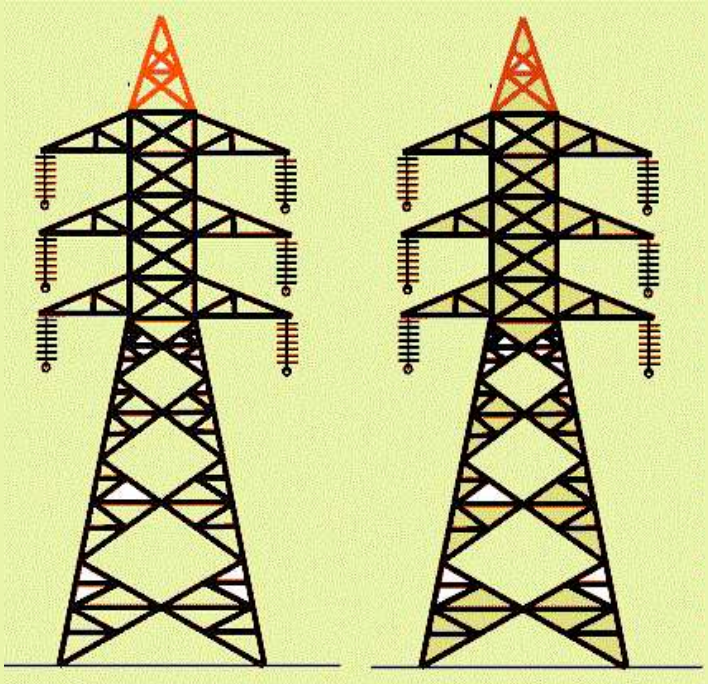
PAKISTAN POWER SECTOR
TRANSMISSION

TRANSMISSION

- NATIONAL TRANSMISSION AND DISPATCH COMPANY

  (NTDC)

  - 220 KV
  - 500 KV



PURCHASING

- CENTRAL POWER PURCHASING AGENCY

  (CPPA-G)

PAKISTAN POWER SECTOR
DISTRIBUTION

DISTRIBUTION COMPANIES

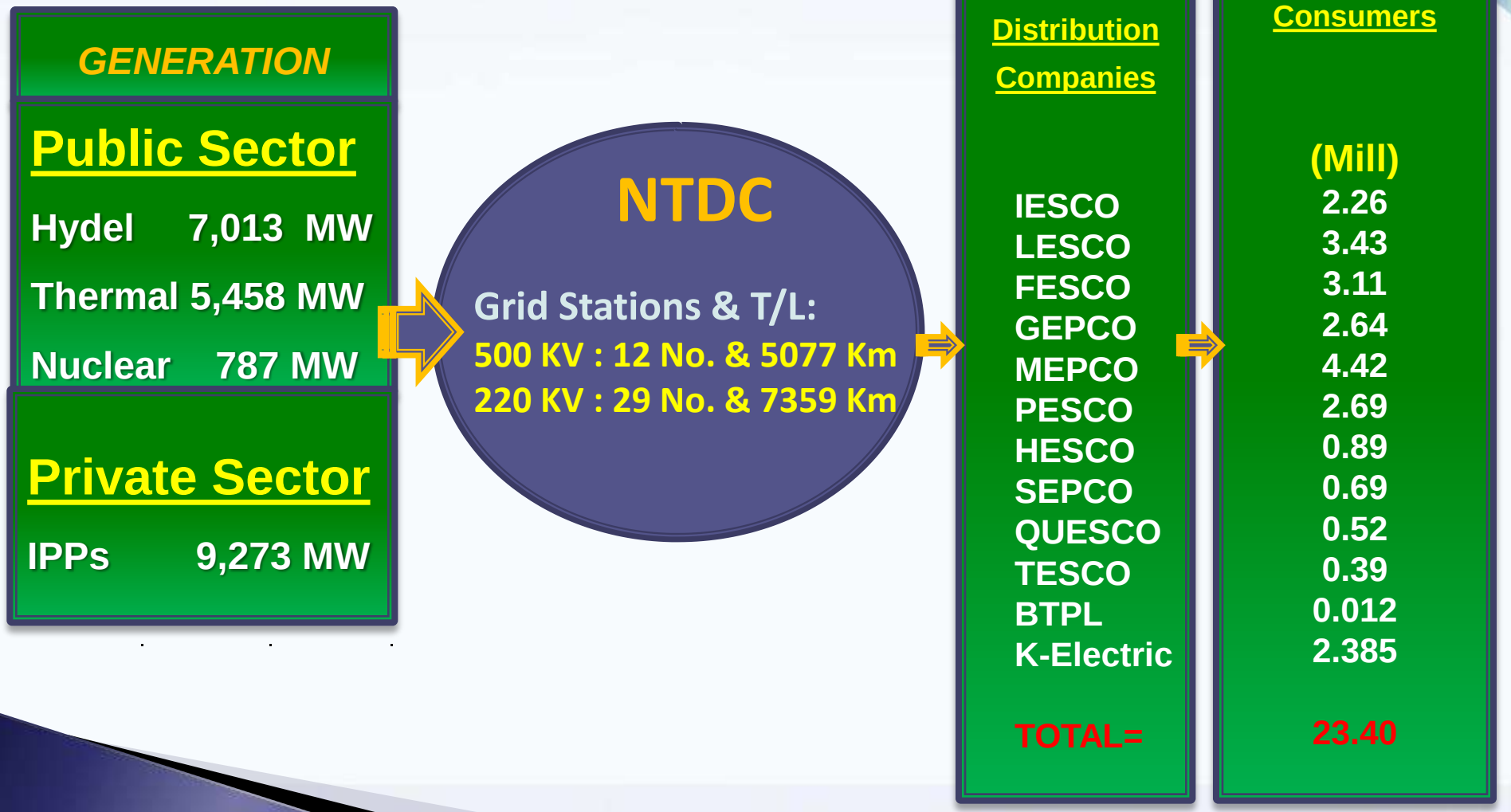
- **10 DISTRIBUTION COMPANIES**

(DISCOs)

  - **132 KV**
  - **11 KV**

- **3 Phase Meter** :**TOD (Peak, Off Peak**
- **Single Phase Meters** : **Slab Rates**

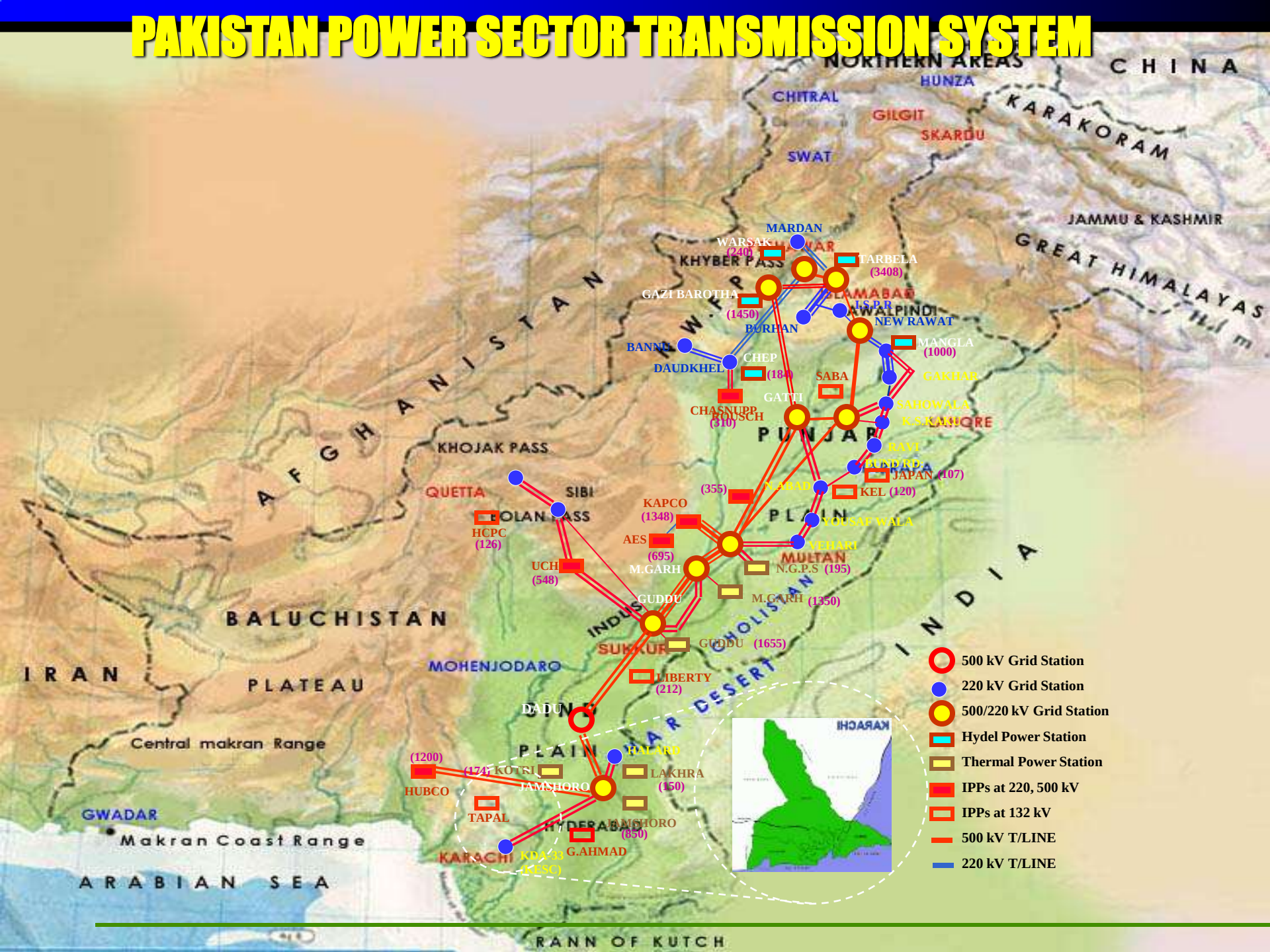
PAKISTAN POWER SECTOR - TRANSMISSION



LEVELLIZED TARIFF S (GENERATION)

- **HYDEL** = 7-9 C/kWh
- **COAL** = 8 to 9.5 C/kWh (imported to local)
- **GAS** = 6-7 C/kwh (but no sufficient gas reserves)
- **RFO** = 20 C/kWh
- **WIND** = 15 C/kWh
- **Solar** = 14-15 C/kWh
- **LNG** = to be re-determined by NEPRA

PAKISTAN POWER SECTOR TRANSMISSION SYSTEM



PRIVATE SECTOR PROJECTS IN OPERATION

Tot. Capacity: **9,528 MW**

AZAD JAMMU & KASHMIR

New Bong Escape Hydropower Project	84	Mar 2013

PUNJAB

Altern Energy Ltd, Attock	29	Jun 2001
Japan Power Generation, Lahore	135	Jan 2000
Kohinoor Energy Ltd., Lahore	131	Jun 1997
Southern Electric Co., Lahore	136	Jul 1999
Saba Power Company, Lahore	125	Dec 1999
AES Lalpir Ltd., Multan	362	Nov 1997
AES Pak Gen, Multan	365	Feb 1998
Fauji Kabirwala Co., Multan	157	Oct 1999
Rousch Power, Multan	450	Dec 1999
KAPCO, Muzaffargarh	1638	Jun 1996
Attock Gen, Rawalpindi	165	Mar 2009
Atlas Power Ltd., Sheikhupura	225	Nov 2009
Nishat Power Ltd., Lahore	200	Nov 2009
Saif Power Ltd., Sahiwal	229	Apr 2010
Orient Power Ltd., Balloki, Kasur	229	May 2010
Nishat Chunian Power Ltd., Lahore	200	Jul 2010
Sapphire Electric Co. Ltd., Muridke	225	Oct 2010
Liberty Power Tech Ltd., Near Faisalabad	200	Jan 2011
HUB Power Company Limited, Narowal	220	Apr 2011
Halmore Power Generation Co. Ltd., Bhikki	225	June 2011
Davis Energen Power Ltd., Jhang	11	July 2013

BALOCHISTAN

Hub Power Project, Hub	1292	Mar 1997
Uch Power Ltd., Uch	586	Oct 2000
Habibullah Coastal, Quetta	140	Sep 1999
Uch-II Power Limited, Uch	404	Apr 2014

SINDH

TNB Liberty Power Ltd., Daharki	235	Jun 2001
Tapal Energy Ltd., Karachi	126	Jun 1997
Gul Ahmed Energy Ltd., Karachi	136	Nov 1996
Engro Powergen Qadirpur Ltd., Dakarki	227	Mar 2010
Foundation Power Co. (Daharki) Ltd.	185	May 2011

INVESTORS AND LENDERS PARTICIPATING IN PRIVATE POWER PROJECTS

INVESTORS		LENDERS	
Local	**Foreign**	**Local**	**Foreign**
• Nishat Group • Sapphire Textile Ltd. • Attock Refinery Ltd. • Engro Chemical • Shirazi Investment • Fauji Foundation • Saif Group • Liberty Mills • Descon Group • Gul Ahmed • Tapal Family • Saigols • HUBCO • Lucky Group • Siddiquesons Ltd.	• International Power (UK) • Congen Technology • El Paso (USA) • Tenaska (USA) • Mitsui (Japan) • Xenel (KSA) • TNB (Malaysia) • AES Corporation • AEB • IFC • Oman Oil • DEG Germany • GE Capital • GDF Suez (France) • KOSEP, Korea • K-Water, Korea • CMEC, China • Shanghai Electric Group Co. • Power Construction Corporation, China • China Power International Holding Company. • China Ghezouba Group • China Three Gorges	• National Bank of Pakistan • Habib Bank Ltd. • United Bank Ltd. • Muslim Commercial Bank • Allied Bank Ltd. • Askari Bank Ltd. • Faysal Bank Ltd. • Meezan Bank Ltd. • Bank Al Habib • Habib Metropolitan Bank Ltd. • The Bank of Punjab • Soneri Bank Ltd. • NIB Bank Ltd. • Pak Oman Investment Co. • Pak China Investment Co. • Saudi Pak Industrial and Agricultural Investment Co.	• IFC • World Bank • ADB • IDB • US Exim Bank • AIDEC • CDC (UK) • EDC (UK) • SACHE (Italy) • ANZ Banking Group (Australia) • ABN Amro Bank • Jexim (Japan) • Bank of Tokyo Mitsubishi • Toronto-Dominion Bank • DEG (Germany) • EMO (Netherlands) • PROPARCO (France) • SWEDFUND (Sweden) • K-EXIM • EXIM Bank of China • Industrial and Commercial Bank of China • China Development Bank

POWER GENERATION EXPANSION PLAN

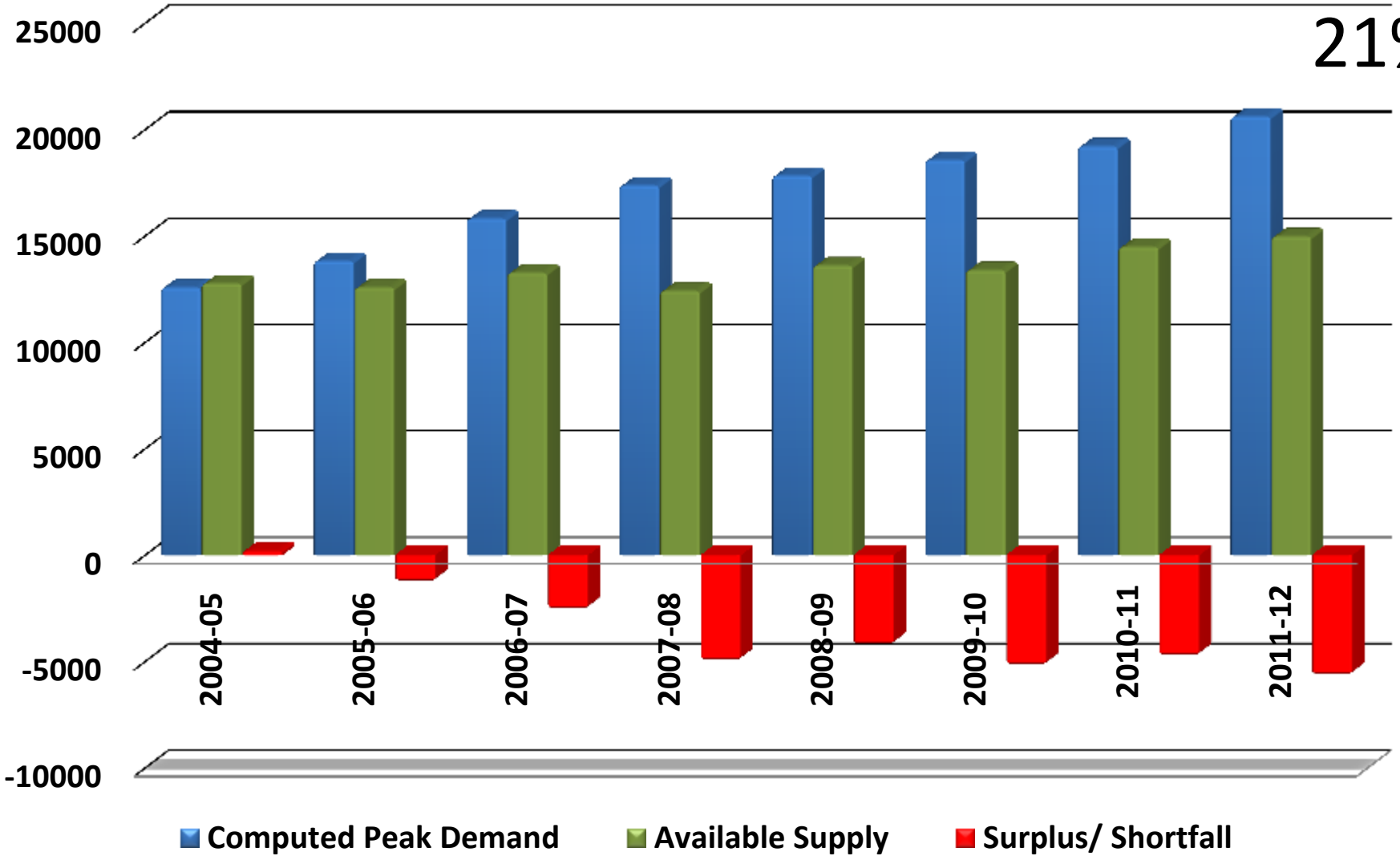
PAKISTAN'S POWER SECTOR EXPANSION

- **Currently Country is facing deficit of around 6,000 MW in peak summer months whereas the power demand has been growing by 6-7% per annum resulting into load shedding of 8-16 hours.**
- **Expansion in Transmission Network is required to evacuate power from upcoming projects.**
- **Due to Financial Constraints in the Public Sector, the GOP is focusing on private sector to invest in PPS to bridge the electricity demand supply gap.**

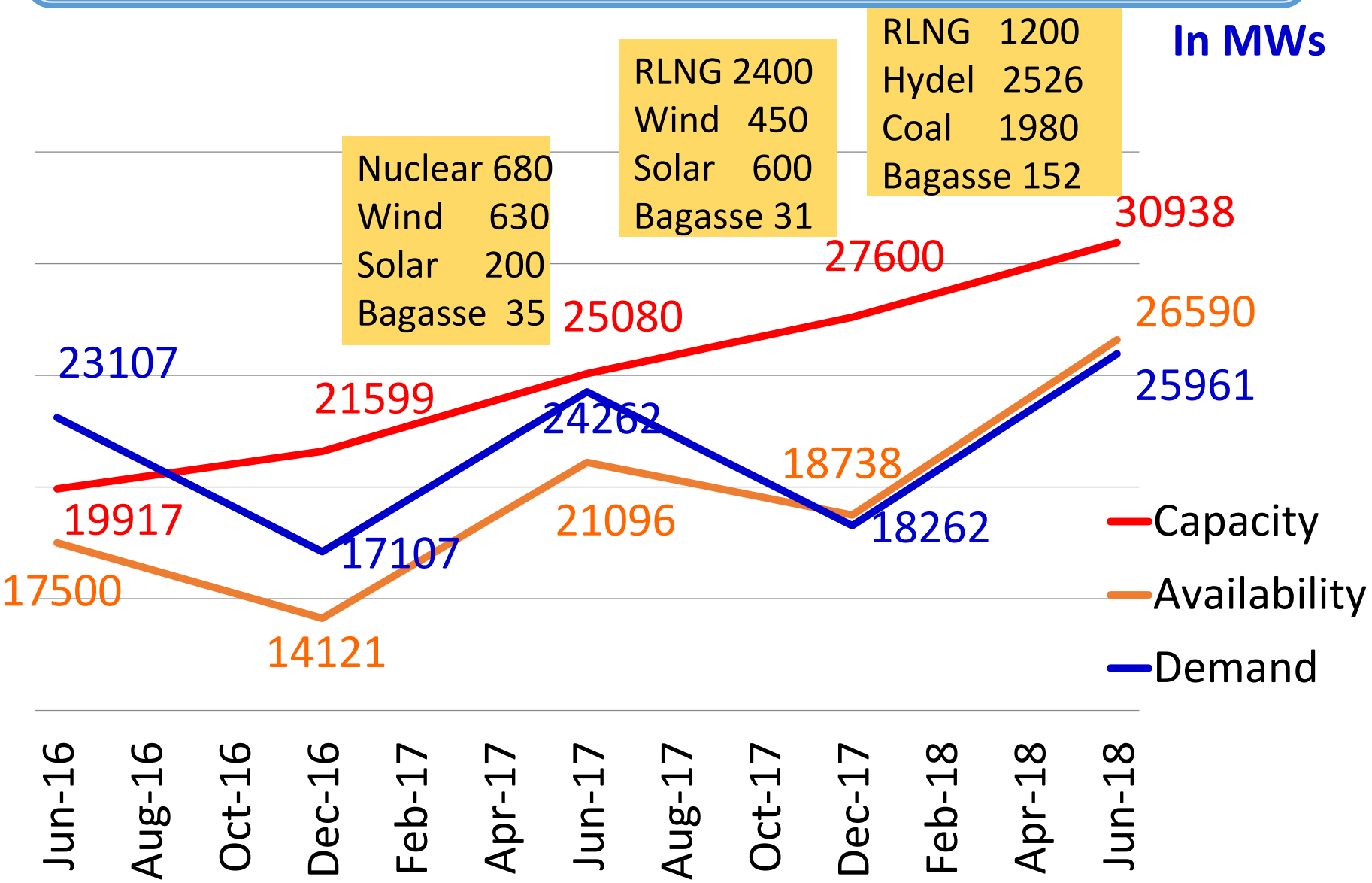
Historical Supply & Demand

Increase in Available Supply 2008-2012

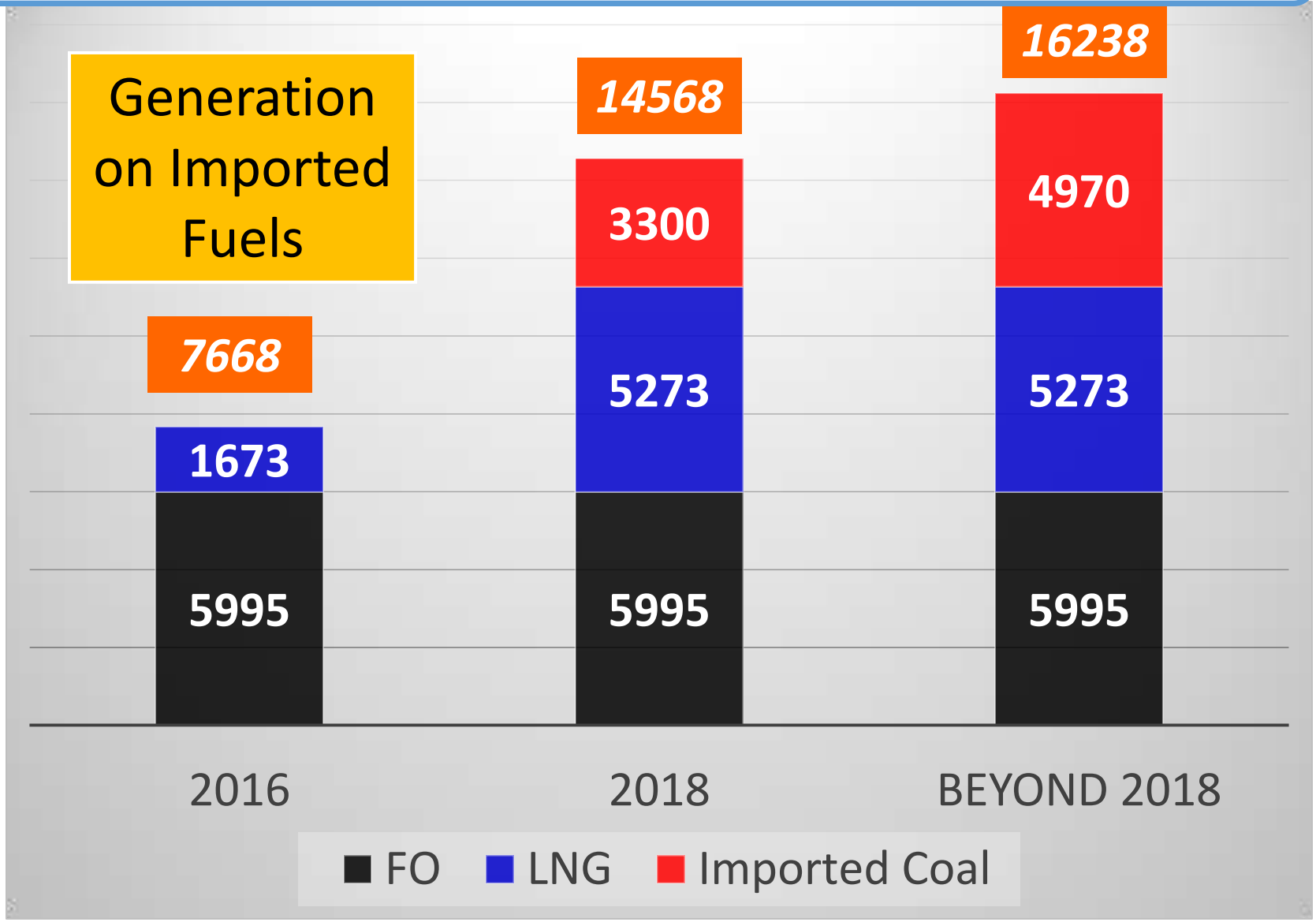
21%



Power Demand and Generation
SHORT TERM SCENARIO

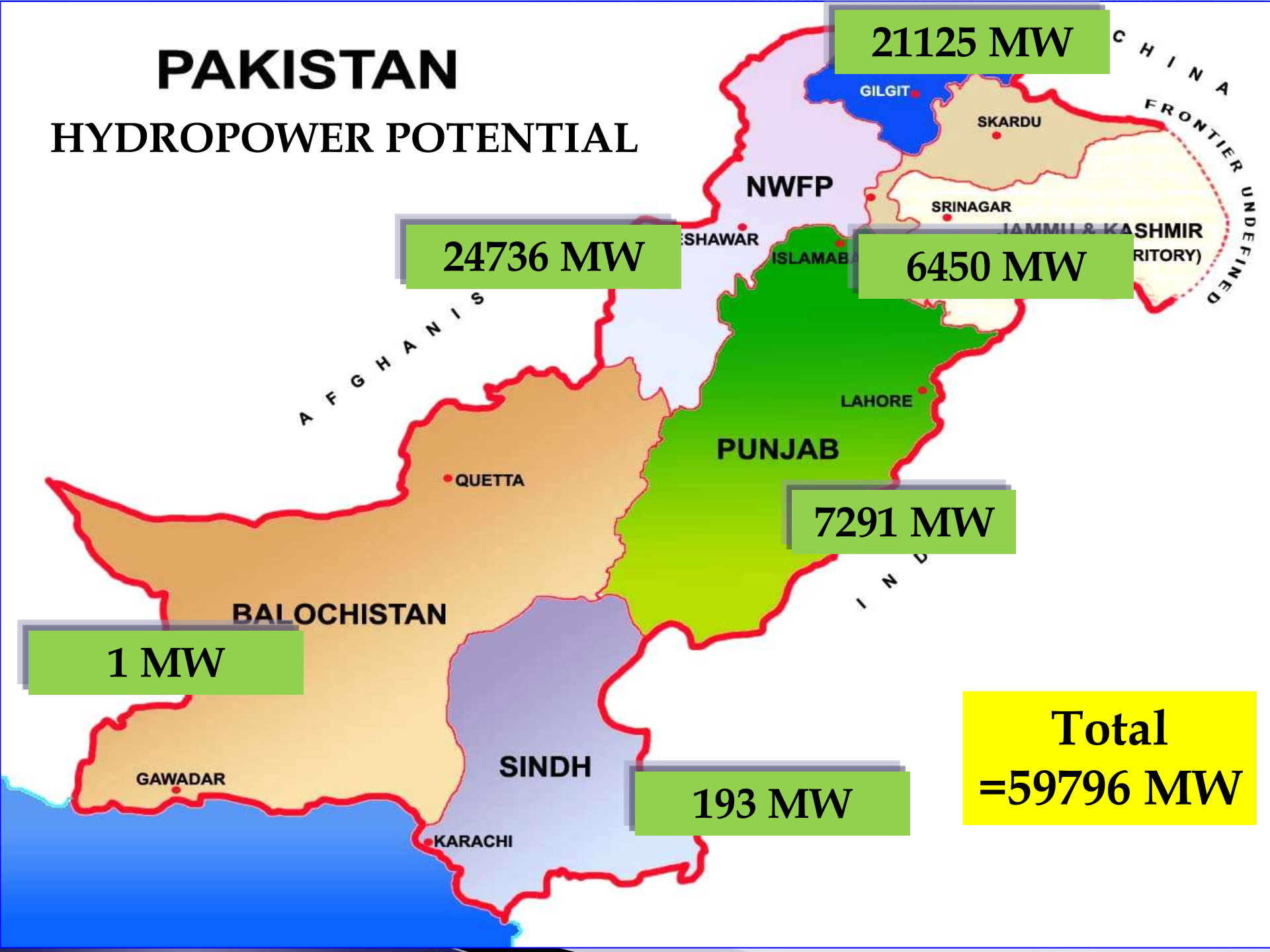


IMPORTED FUELS DOMINANT



PAKISTAN

HYDROPOWER POTENTIAL



Pakistan's Coal Reserves

Sindh
185,457 million tonnes

Punjab
235 million tonnes

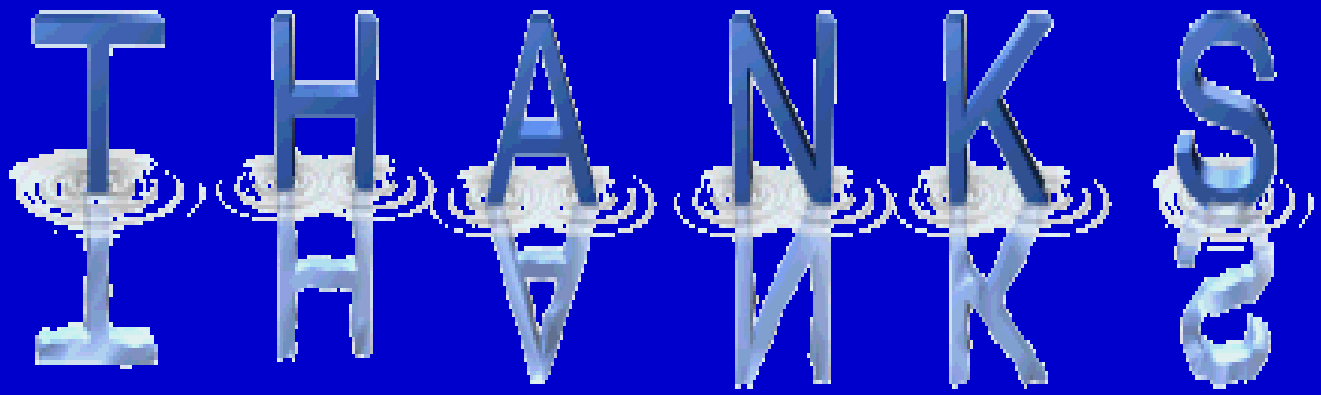
Balochistan
217 million tonnes

KP
90 million tonnes

Azad Kashmir
9 million tonnes

UPCOMING IPPs

Description/ Year	Hydel		Coal		Gas		Total (MW)	No. of Projects
	MW	No.	MW	No.	MW	No.		
2017	150	1	3,300	3	0	0	3,450	4
2018	0	0	2,640	2	1000	4	3,640	6
2019	232	2	1910	4	0	0	2,142	6
2020	1,360	2	0	0	0	0	1,360	2
2021	870	1	0	0	0	0	870	1
2022	2,033	5	0	0	120	1	2,153	6
2023	1,690	2	0	0	0	0	1,690	2
2024	1,088	4	0	0	0	0	1,088	4
2025	80	1	0	0	0	0	80	1
Grand Total	7,503	18	7,850	9	1120	5	16,473	32


THANKS