Long-Term Energy Scenarios (LTES) for developing national energy transition plans in Asia.

Webinar series

PAKISTAN ENERGY SECTOR

Manager: Shahbaz Ahmed
Power System Planning Department, NTDC
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Pakistan Power Sector Players

**Generation**
- WAPDA
- PAEC
- IPPs

**Transmission**
- 500 kV 220 kV
- 500 kV 220 kV

**Distribution**
- 132 kV 11 kV

**DISCOs**
- Domestic Consumer
- Commercial Consumer
- Industrial Consumer
- Agricultural Consumer
- Public Lightening
- Bulk Buyer

- K-Electric
Pakistan Power Sector Governance Framework

- **NEPRA Act**
  - Implementing Regulations
  - NTDC Grid Code, Distribution Code, etc.

- **Licenses**
  - GENCOs, TRANSCo, System Operator, DISCOs, BPCs

- **Contracts and Agreements**
  - Connection and Inter-connection Agreements, Use of System Agreement, Power Purchase Agreements, Power Sales Agreement, Wheeling Agreement, System Services Agreements, etc.

Promulgated by Parliament of Pakistan
Approved by NEPRA
Issued by NEPRA
Between Power Sector Entities
LTES Development Framework in Pakistan

Timeline

- Energy Policies
  - Very Long Term: Strategic Expansion Policies
  - Long Term: Adequacy of Supply
  - Medium Term: Firm Energy Supply
  - Short Term: Security of Supply

Government of Pakistan
Power System Planning
National Power Control Centre
Planning Process in NTDC Grid Code

- Responsible: SO
  - Global Demand Forecast

- Responsible: SO
  - Generation Plan (IGCEP)

- Responsible: SO + NGC
  - Centralized Transmission System Expansion Plan (TSEP)

- Responsible: TNOs
  - Transmission Plans for respective territories

- Responsible: TNOs
  - Transmission Investment Plans (TIPs)

- PMS based area forecasts for respective territories

- Responsible: TNOs
  - Spatial Demand Forecast
Planning Timelines as per NTDC Grid Code

- Annual submission of IGCEP [10-year plan] and TSEP [10-year plan] together as “Integrated System Plan” by 30th April each year to the Authority for approval; [PC 2.1; sub-section (e)]

- The SO shall share the results of IGCEP with the NGC and other TNOs by 31st December each year to enable them in the timely preparation of TSEP. [PC 4.2.5]

- The NGC shall submit this consolidated proposal to the SO as a centralized TSEP not later than 31st March each year. [PC 4.3.3]

- Annual preparation of at least 5 years “Transmission Investment Plans” (TIP) based on the approved TSEP for their respective territories and submit to the Authority for the approval; [PC 2.2; sub-section (e)]

- Each TNO shall submit its TIP to the Authority for approval in accordance with the Applicable Documents, but no later than three (03) months from the date of approval of the TSEP. [PC 4.1.1]
Pakistan LTES Stakeholders and Process

**Internal Discussion:**
- Setting Planning Objectives
- Data Collection Request to Stakeholders

**Modelling and Simulation**
- 1st, 2nd and 3rd Data Collection Meetings
- Draft Report Preparation and Submission to BoD

**Draft Report**
- Submission to NEPRA after approval from BoD
- NEPRA Determination on Planning Efforts
- NEPRA Public Hearing and Consultation
Journey of LTES in Pakistan

Master/Integrated Plans:
- First Master Plan (NPP) was prepared in 1994 by a Canadian Consultant - SNC Lavalin.
- Second Master Plan was prepared in 2005 by a Canadian Consultant.
- Third Master plan (NPSEP) was prepared in 2011 by Canadian Consultant – SNC Lavalin.
- Fourth major Integrated plan was prepared in 2016 by a Japanese Consultant – JICA.

In-house prepared Stand Alone Generation Expansion Plans:
- First IGCEP was submitted to NEPRA on 26th February, 2019.
- Second IGCEP was submitted to NEPRA on 20 Apr. 2020.
- IGCEP 2021 was approved by NEPRA on 24 Sep. 2021.
- IGCEP 2022 was approved by NEPRA on 3 Feb. 2023.
- Revised Grid Code was approved by NEPRA on 22 Mar. 2023.
- ISP (IGCEP and TSEP) is in development stages.

NTDC reduced reliance on international consultants - developed indigenous resources in this journey.
Power Supply Outlook 2022-2031

1. REFERENCE SCENARIO
   - 40% RE Share in power generation mix by 2025
   - 60% RE by 2030
   ARE Policy

2. HIGH RE + NUCLEAR + IMP. COAL RETIREMENT
   - 70% RE Share in power generation mix by 2031 (IGCEP 2022-31).
   - Increase RE above 80% using high indigenous potential of wind, solar and hydro.
Thank you for your attention