

Financing Pakistan's Power Sector after the Global Financial Crisis

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Outline

- Pakistan's power sector
- Key challenges facing sector
- Financing the sector deficit
- Investment in generation in the past decade
- Impact of Global Financial Crisis (GFC)
- GOP measures to tackle challenges
- Medium-term outlook
- Options for moving forward

Pakistan's power sector

2009-10 Stats

21,593MW Cap

99TWh Gen

73.6TWh Sold

21.6m customers

Pakistan's power sector

Public sector Private sector

PEPCO

4 GENCOs
4,885 MW

NTDC/CPPA
(Transco)

8 DISCOs
19.6m customers

WAPDA HYDEL
6,444 MW

NUCLEAR
462 MW

24 IPPs, 2 Rentals, SPPs
7,412MW, 172MW, 272MW

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KESC

KESC GEN
1,946 MW

TRANSMISSION

DISTRIBUTION
2.0m customers

REGULATOR: National Electric Power Regulatory Authority (NEPRA)

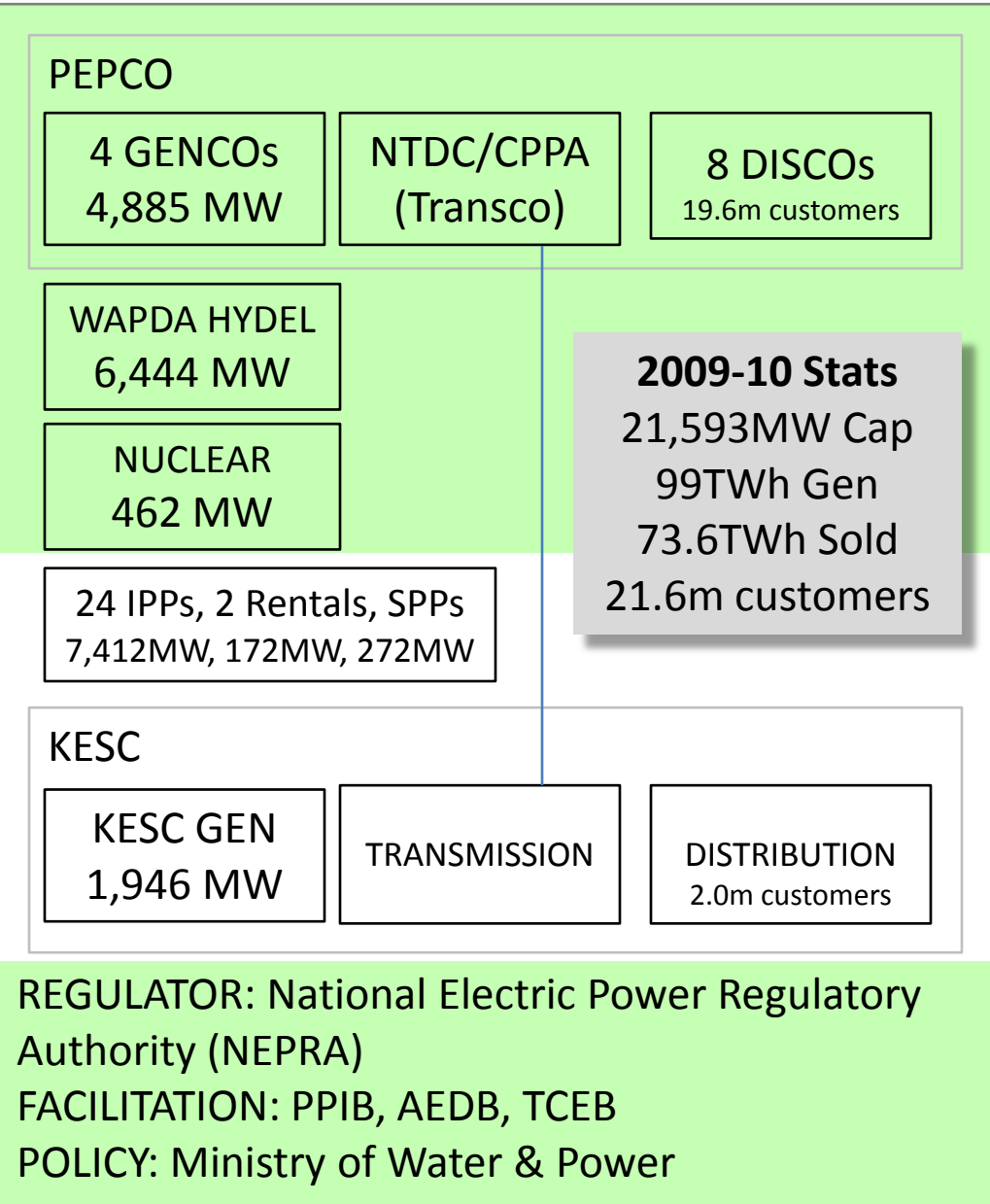
FACILITATION: PPIB, AEDB, TCEB

POLICY: Ministry of Water & Power

Pakistan's power sector

Public sector Private sector

Access high (98% urban; 81% rural—PSLM) but service quality inadequate



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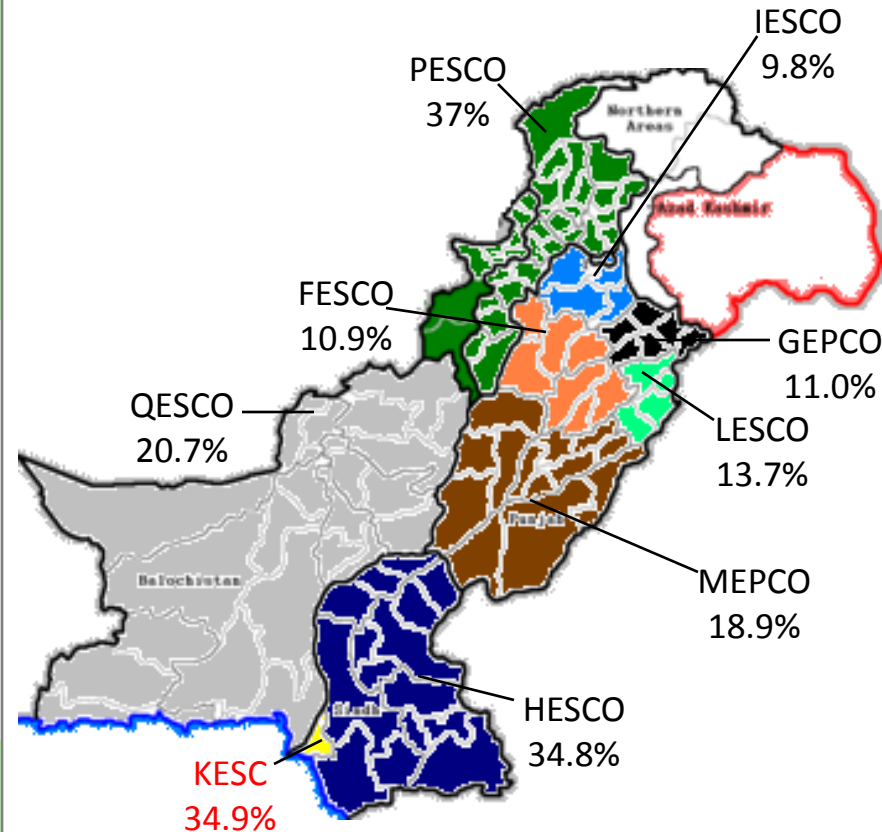
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Distribution losses in 2009-10

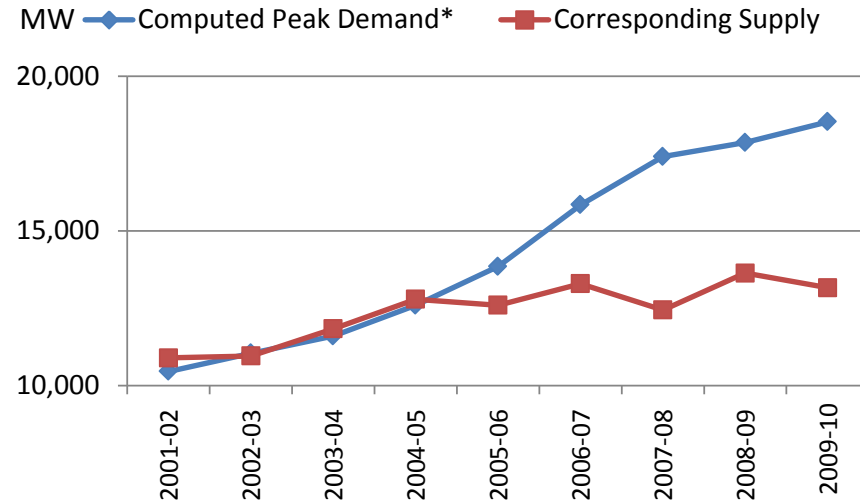
Energy Sold as % of Energy Purchased (PEPCO)

Key challenges: Stagnant supply

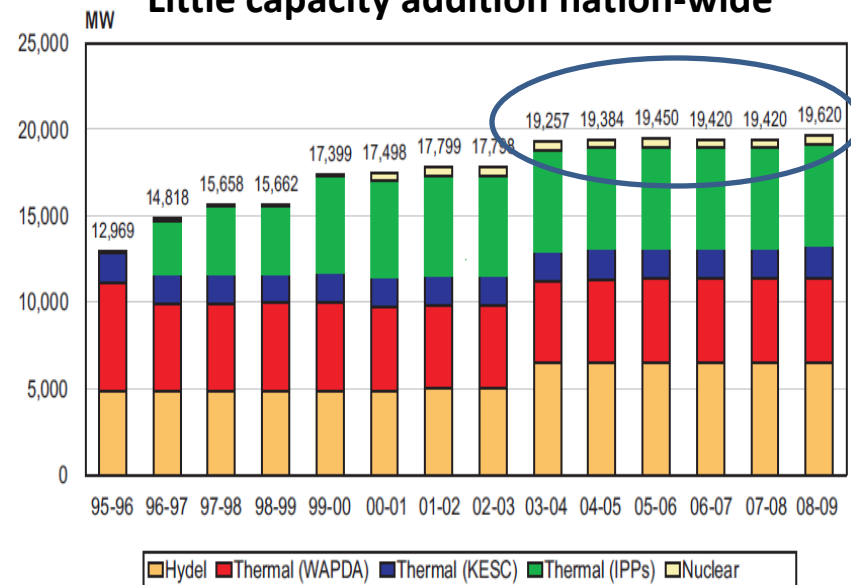
- 2002-2007: 7% p.a. real GDP growth → electricity demand rose 40 %
 - Millions of HH appliances sold
 - 1m new connections per year
 - Rural electrification
- Installed capacity remained ~20GW—firm: ~15GW in 2007
- More generation from same capacity—aged plants in GENCOs
- 2008-10: Demand growth slower; ~2,000MW in new capacity added but shortages continue

Shortage started in 2005-06

(graph shows PEPCO system only)



Little capacity addition nation-wide



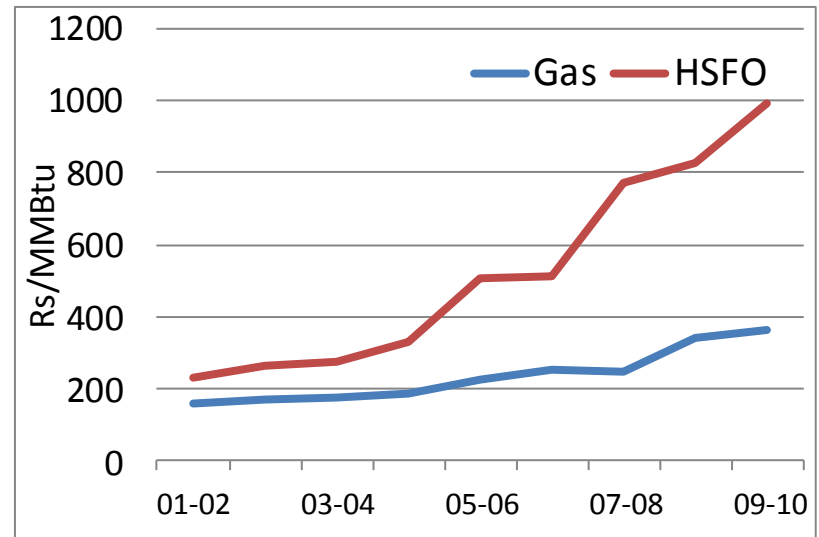
Key challenges: Shift in fuel mix led to sector financial deficit

In thermal-dominated generation fleet, fuel shifted from gas to furnace oil

With shift from price-capped gas to market-price furnace oil, cost of generation rose

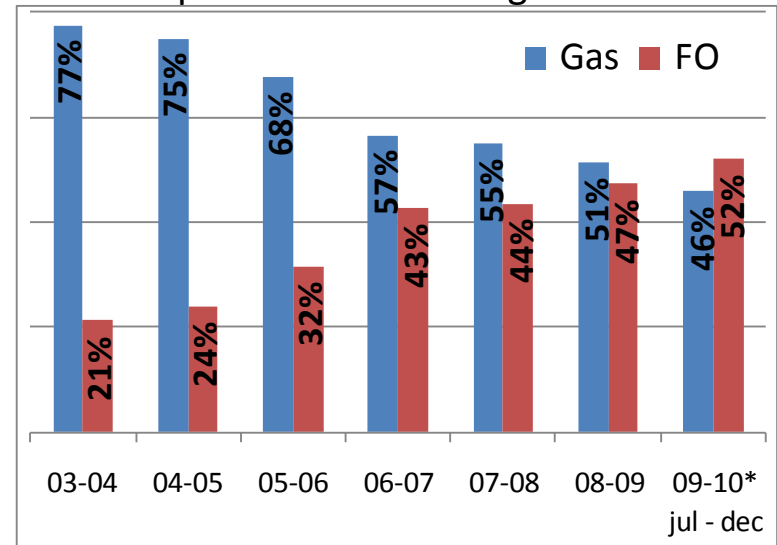
→ sector financial deficit

Prices of gas, furnace oil to the power sector

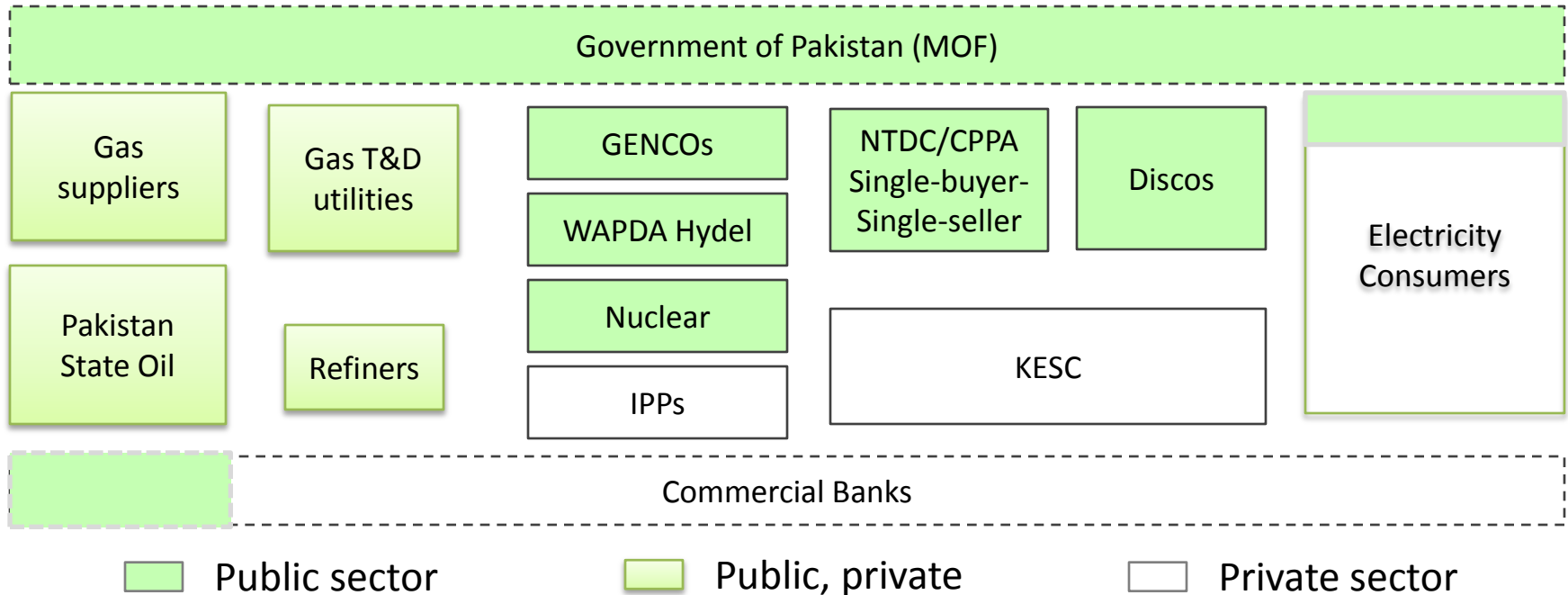


Shift in fuel mix → higher generation costs

Proportion of thermal generation



Key challenges: Circular Debt



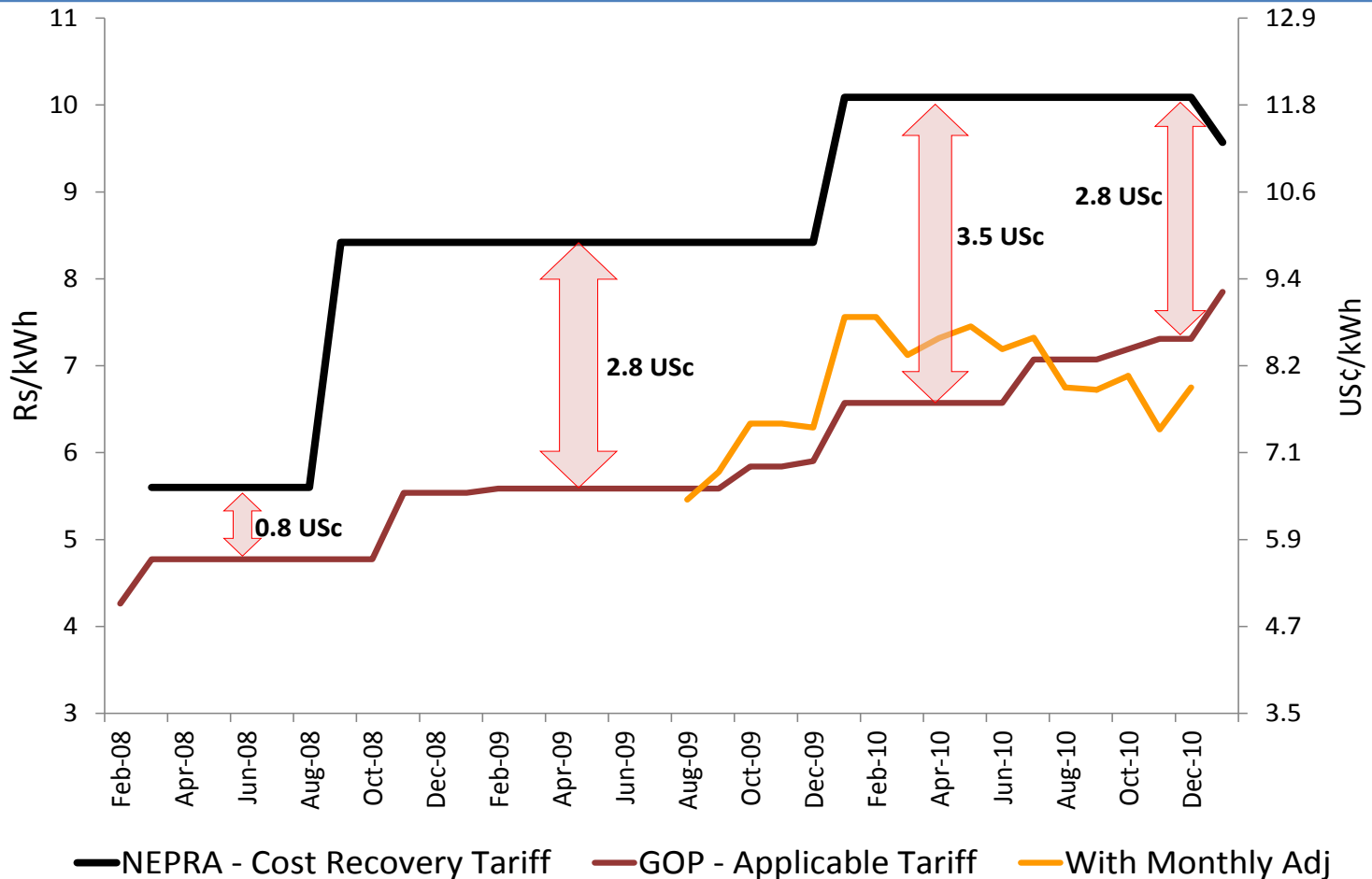
How could the sector's deficit be financed?

- By Consumers – through higher tariffs
- By Government – through tariff subsidies
- By Commercial banks – through lending to GOP/sector entities
- By Sector Entities – through ballooning balance sheets, inadequate investment and, possibly, eroding equity
- All of the above

Financing the Sector Deficit – Through tariff increases

Tariffs could not be raised to cover costs → subsidy burden + higher cost of losses

| PEPCO discos only | FY08 | FY09 | FY10 |
|---------------------|------|------|------|
| Units purchased-TWh | 75 | 72 | 77 |
| ATC Losses | 23% | 26% | 28% |



NEPRA determines cost recovery tariff, GOP notifies applicable tariff; Difference = GOP subsidy burden

Financing the Sector Deficit – Through subsidies

Subsidy burden causes fiscal strain

GOP was not in a position to bear the subsidy burden

| Energy Subsidies | | | | |
|----------------------------------|----------------|----------------|----------------|----------------|
| As % of GDP | 2005/06 | 2006/07 | 2007/08 | 2008/09 |
| Electricity | 0.6% | 0.7% | 1.3% | 1.4% |
| POL (petroleum products) | 0.1% | 0.3% | 1.6% | 0.5% |
| Direct Energy Subsidies** | 0.7% | 1.0% | 2.9% | 1.8% |

Sources: Economic Survey of Pakistan, SBP, World Bank

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- Pakistan entered IMF program in Nov 2008 with commitment to significantly curtail and target subsidies
- Low collections – particularly from FATA (5%) and KESC
- GOP policy of uniform tariff across country → cross-subsidy among discos
- Subsidy leakage to higher-slab domestic consumers—has been reduced
- Subsidies also supporting inefficiency and distribution losses

Financing the Sector Deficit – Through commercial banks

Borrowing by GOP & discos crossed banks' exposure limits

As of June 2010 (State Bank of Pakistan),

Total assets of Pakistan's banks: US\$ 75bn

Total advances US\$ 37bn

of which

Exposure to power sector: US\$ 4.35bn

including

Fixed investments (new IPPs) US\$ 1.20bn

Working capital US\$ 0.35bn

Circular debt/Term Finance

Certificates (TFCs) US\$ 2.80bn

Interest cost increased

Rates offered by commercial banks to disco's & GOP

2008

Feb: 6m KIBOR + 0.05%

Mar: 6mK + 0.35%

July: 6mK + 0.60%

Sep: 6mK + 0.60%

2009

Mar: 6mK + 1.75% (TFCs \$1bn)

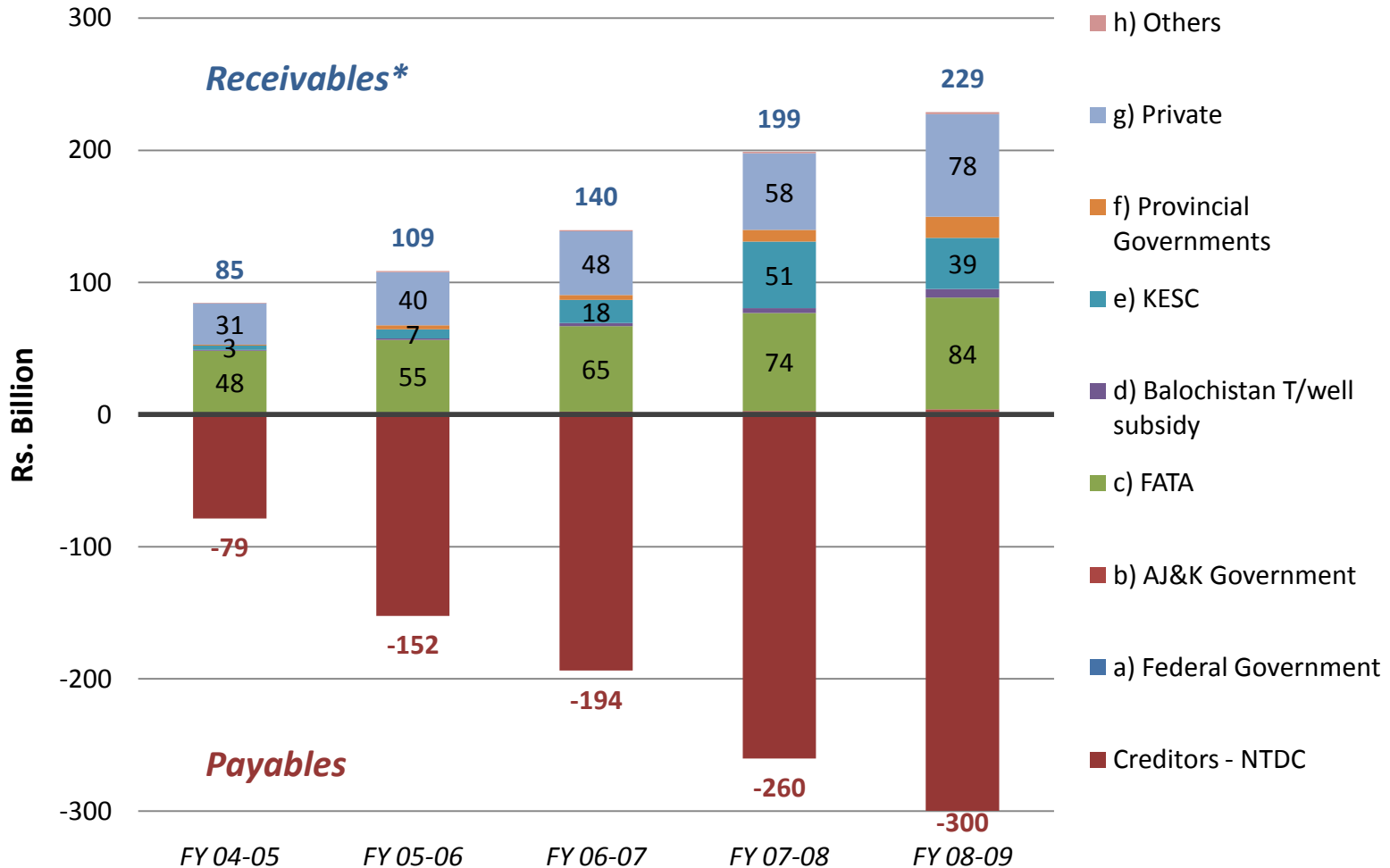
Sep: 6mK + 2.0% (TFCs \$1bn)

Assuming 10% organic growth in banking assets and 10% exposure to power sector → \$350m new lending

Resolution of circular debt can unlock capital for new generation projects

Financing the Sector Deficit – Through sector entities

PEPCO Receivables & Payables



* Receivables do not include tariff differential subsidies.

Moderate private response in power generation

2002 Power Policy – Moderately successful in meeting growing demand

- Attracted domestic investors; all (except Engro) with local debt
- 7 projects reached financial closure: 1,475MW, US\$1.4bn (size: 150-250MW)
- Little FDI:
 - US\$18bn FDI in 2002-2008, only US\$0.75bn to power – foreign investors willing to take telecom, banking, IT risk but not power sector risk – fall-out of debt re-negotiations
- Processing Delays → Cost over-runs, investors/lender distress
 - One-stop shop approach → multiple stops; 9 thermal IPPs averaged 58 months (~5 years) from Letter of Intent to COD

GOP chose to not invest in thermal generation; delays in public sector hydro projects

→ Generation investments off least cost expansion path (hydro, coal, gas, oil, RE)

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GOP announced plan to add capacity in 2009 but was hit by GFC

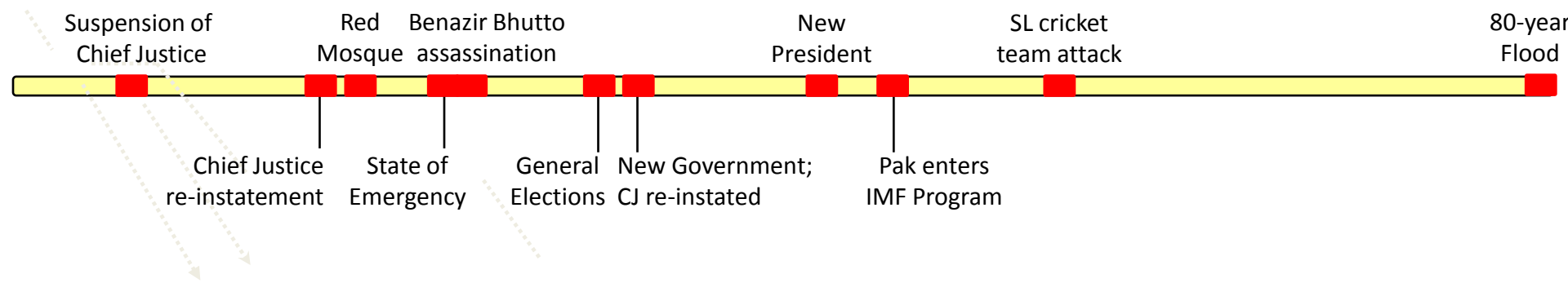
| | Planned | Achieved in 2009 |
|---|----------------|-----------------------------|
| (i) Rental power plants | 2,250MW | - |
| (ii) New IPPs through international competitive bidding | 1,675MW | - |
| (iii) <u>Rehabilitation of GENCOs</u> | 300MW | - |
| Total | 4,225MW | |

This plan was impacted by Global Financial Crisis

Pakistan was in a weak macro-economic position as GFC set in

JAN 2007 JUN JAN 2008 JUN JAN 2009 JUN JAN 2010 JUN

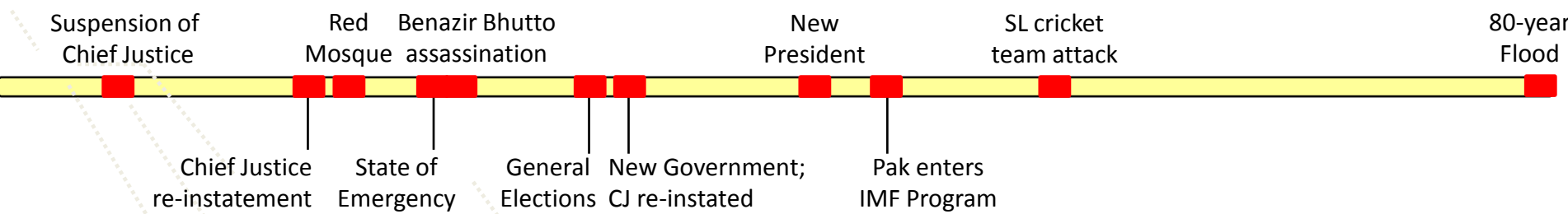
POLITICAL EVENTS



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POLITICAL EVENTS



FY07

Growth 6.8%
 CPI 7.8%
 Fiscal deficit 4.3%
 CA deficit 4.8%
 PKR 60.4/US\$

FY08

Growth 4.1%
 CPI 12%
 Fiscal deficit 7.6%
 CA deficit 8.5%
 PKR 68.2/US\$

FY09

Growth 2.0%
 CPI 20.8%
 Fiscal deficit 5.2%
 CA deficit 5.7%
 PKR 81.3/US\$

FY07
 Power shortage
 ~2,500MW

FY08
 Power shortage
 ~5,000MW

FY09
 Power shortage
 ~4,200MW

FY10
 Power shortage
 ~5,300MW

Goal

**CLOSE
DEMAND-
SUPPLY GAP
WITH LOW-
COST
ENERGY**

**FINANCIAL
RECOVERY**

**IMPROVE
EFFICIENCY
OF DISCOs**

**EE &
CONSER-
VATION**

| Goal | Issue |
|---|---|
| CLOSE DEMAND-SUPPLY GAP WITH LOW-COST ENERGY | More gas to power sector |
| | Rapidly expand generation |
| | Focus on domestic energy resources |
| FINANCIAL RECOVERY | Tariffs should cover costs |
| | Move circular debt away from sector |
| | Contain subsidy |
| | Financing vehicle |
| | Increase collection |
| IMPROVE EFFICIENCY OF DISCOs | Improve discos' governance through transition plan |
| EE & CONSERVATION | Clip demand peaks Encourage efficiency through tariff regime |

| Goal | Issue | GOP Measures |
|---|---|--|
| CLOSE DEMAND-SUPPLY GAP WITH LOW-COST ENERGY | More gas to power sector | <ul style="list-style-type: none"> - Allocation of new gas finds to power generation - GSAs between gas suppliers/power producers |
| | Rapidly expand generation | <ul style="list-style-type: none"> - PM's Vision 2020 - Rental Power Projects; Accelerate IPPs; rehabilitate GENCOs |
| | Focus on domestic energy resources | <ul style="list-style-type: none"> - Thar Coal: feasibilities for two private projects complete; significant infrastructure investment needed - Hydro: large, medium, and small projects active |
| FINANCIAL RECOVERY | Tariffs should cover costs | <ul style="list-style-type: none"> - Average tariff increased by > 70% since Feb 2008 - Monthly fuel cost adjustments since Aug 2008 |
| | Move circular debt away from sector | <ul style="list-style-type: none"> - US\$2bn TFCs issued by GOP - GOP vehicle – Rs 301bn debt off disco balance sheets |
| | Contain subsidy | <ul style="list-style-type: none"> - Limit fiscal burden through cross-subsidies in tariff regime |
| | Financing vehicle | <ul style="list-style-type: none"> - Establishment of Energy Sector Development Fund by MWP |
| | Increase collection | <ul style="list-style-type: none"> - Federal Gov't deducting provincial allocations at source - US\$1bn FATA bills picked up by GOP |
| IMPROVE EFFICIENCY OF DISCOs | Improve discos' governance through transition plan | <ul style="list-style-type: none"> - Comprehensive performance audits → improvement plans - Re-constitution of Boards of all disco's; devolution from PEPCO - Discos have signed Performance Contracts with MWP |
| EE & CONSERVATION | Clip demand peaks Encourage efficiency through tariff regime | <ul style="list-style-type: none"> - Closure of commercial markets at 8pm during summers - Daylight savings; heavy media campaign - Highest consumption slab pays three times more than first slab |

Medium-term outlook

Grim prognosis for investment

- Given large fiscal/external imbalances, key economic goal of demand compression likely to continue
- Tight monetary policy → High cost of borrowing, decline in capital formation, banks investing in government securities
- Banking sector already over-exposed to power sector
- Investment to remain low (lags monetary expansion by 18-24 months)

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Key messages from domestic financial sector

- GOP leadership and concrete plan needed
- Did not participate in Rental Power Plants due to lack of transparency, state/condition of plants, and sponsor weakness
- Strength of sovereign guarantee may need to be backed up
- PPIB security package is strong but delays/regulatory snags need to be avoided
- Unlike 1994 policy, fuel supply not guaranteed by 2002 Policy despite shortages
- Appetite exists if good projects come up – willing to consider public sector
- Most projects do not seem to get past development stage
- IFIs should play an active role

June, 2010

The Prime Minister's Vision 20-20 Power Program

Project-by-Project Status

| Project | MW | Agency in charge | Est Cost (\$bn) | COD | Stage | Current Status |
|---------------------------------|---------------|------------------------|-----------------|------|--------------|---|
| HYDROPOWER | | | | | | |
| Suki Kinari | 840 | MD PPIB | 1.2 | 2017 | Advanced | Hydel profits resolution |
| Tarbela 4th Extension | 960 | WAPDA | 0.7 | 2015 | Feasibility | Consultants to start F/S |
| Neelum-Jhelum | 960 | WAPDA | 1.6 | 2016 | Construction | Under construction |
| Dasu (Stages I&II) | 2,160 | WAPDA | 3.9 | 2017 | Feasibility | Consultants being selected |
| Imports (CASA-1000) | 1,000 | CEO NTDC | 0.4 | 2013 | Feasibility | Feasibility study ongoing |
| Total hydropower | 5920 | | 7.8 | | | |
| COAL | | | | | | |
| Thar Block I (for ICB) | 1,000 | MD TCEB | 1.4 | 2015 | Feasibility | Info Memorandum ready |
| Thar Block II (Sind-Engro) | 1200 | MD TCEB | 1.7 | 2015 | Advanced | Feasibility & ESIA done |
| Thar Block V (UCG Project) | 1,000 | MD TCEB | 1.4 | 2015 | Feasibility | Pilot of 2x50MW till Dec '11 |
| Thar Block VI (Oracle) | 300 | MD TCEB | 0.4 | 2015 | Advanced | Feasibility & ESIA done |
| AES Imported Coal | 1,305 | MD PPIB | 1.6 | 2015 | Advanced | Finalizing EPC contract |
| Imported Coal | 1,200 | MD PPIB | 1.7 | 2016 | Concept | Finalizing structure/location |
| Total Coal | 6,005 | | 8.2 | | | |
| GAS | | | | | | |
| Guddu rehabilitation | 800 | PEPCO | 0.8 | 2012 | Advanced | On-going rehab (USAID) & reconstruction (China) |
| Jamshoro rehabilitation | 200 | Privatization Comm/MWP | 0.6 | 2013 | Concept | On-going rehab by USAID |
| LNG-based power park | 2,000 | PEPCO | 1.6 | 2014 | Concept | ECC decision to re-bid |
| New gas (Kunar, Pasakhi, etc) | 2,000 | PEPCO | 1.6 | 2015 | Concept | Address legal issues (MPNR) |
| Naphtha (indigenous fuels) | 1,000 | PEPCO | 1.0 | 2015 | Concept | Feasibility required |
| Total Gas | 6,000 | | 5.6 | | | |
| NEW RENEWABLES | | | | | | |
| Wind (onshore) | 1,000 | MD AEDB | 1.7 | 2015 | Feasibility | Pipeline exists |
| Solar-thermal | 300 | MD AEDB | 0.8 | 2015 | Concept | Finalizing plans |
| Canal-based small hydros | 500 | WAPDA | 0.5 | 2015 | Feasibility | ADB-supported framework |
| Waste-to-energy | 275 | MD AEDB | 0.3 | 2015 | Concept | Feasibility required |
| Total Renewables | 2,075 | | 3.3 | | | |
| Transmission investments | | CEO NTDC | 2.5 | | Advanced | Prioritizing existing projects |
| Distribution investments | | Discos | 5.0 | | Advanced | Prioritizing existing projects |
| Grand Total | 20,000 | | 32.3 | | | |

20,000MW by 2020

Investment Requirements

Generation \$24.6bn

Transmission \$ 2.5bn

Distribution \$ 5.0bn

Total \$32.3bn

Steep financial challenge

Raised \$8.9bn in generation in last 20 years (\$5.7 in '90s)

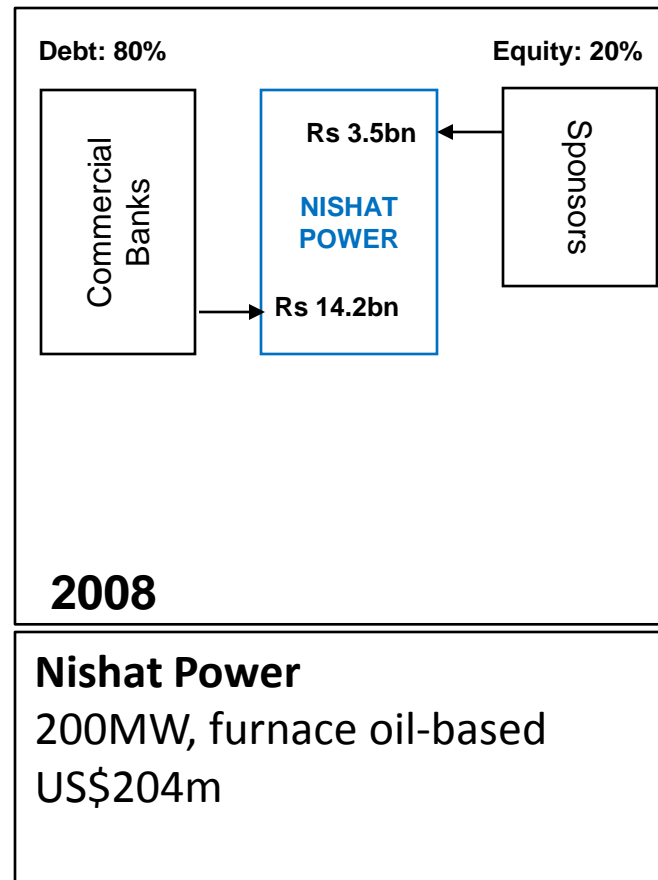
This plan: ~\$3.2bn per year – mostly in hydro and coal

In early years, GOP leadership on some flagship projects backed by IFIs could be a way forward

Options for moving forward

Project structures

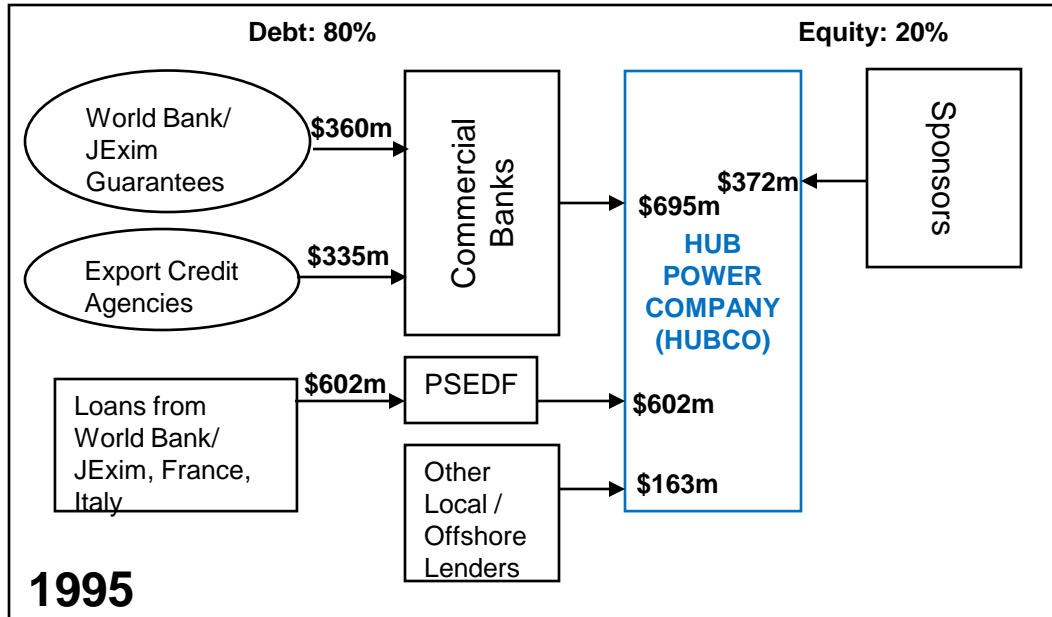
TYPICAL DEAL OF THE 2000s



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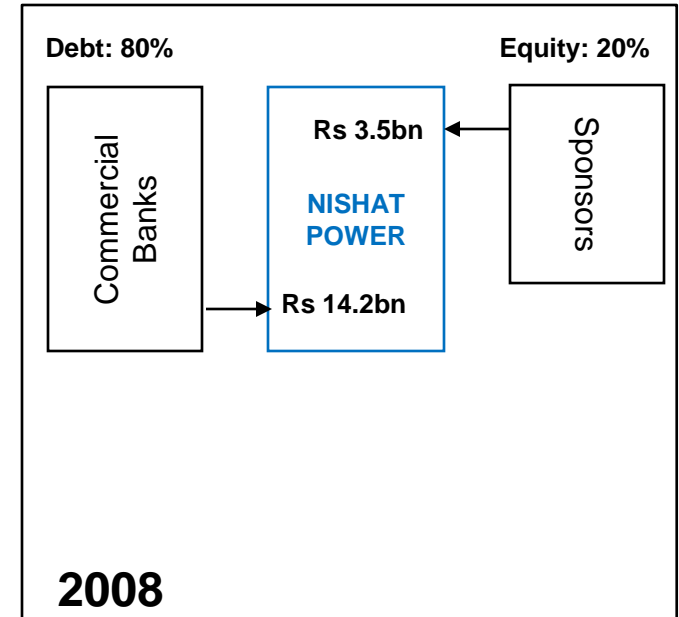
PIONEERING DEAL OF THE 1990s



HUBCO

1,292MW, furnace oil-based
 US\$1.8bn
 Developed basis for all IPPs to come

TYPICAL DEAL OF THE 2000s



Nishat Power

200MW, furnace oil-based
 US\$204m

Flagship projects like HUBCO could help kick-start private investment in the power sector

Options for moving forward

GOP has to build confidence of sponsors/lenders

Key: Least cost power development is more sustainable than rapidly procured power (1994 Policy, RPPs)

- For smaller projects (natural gas, coal, small hydro), strong domestic sponsors can be tapped with tailored incentives
- For large projects: GOP to take lead with IFI support

To restore sector financial sustainability, coordinated approach is needed:

- Clean up balance sheets of sector entities → Power Holding Company
- Operationalize Central Power Purchasing Authority
- Foster wheeling of power to creditworthy buyers
- Develop long-term power finance capability (issue bonds by tapping pension funds, insurance companies, and investment trusts)
- Government to take development risk, then offload to private sector to competitive bidding (Energy Sector Development Fund)

Thank you

Indigenous Energy Resource Potential still to be tapped

| | | | | | |
|-----------------|------------|----------------------|-------------------|-------------|------------------------|
| Oil | 42 MTOE | 314 million bbl | Coal Measured | 1,542 MTOE | 3,450 million tonnes |
| Gas | 526 MTOE | 24 tcf @ 900 btu/scf | Coal Inferred | 25,292 MTOE | 56,582 million tonnes |
| Coal Measured | 1,478 MTOE | 3,450 million tonnes | Coal Hypothetical | 51,091 MTOE | 114,298 million tonnes |
| Installed Hydel | 6,481 | MW | | | |
| Potential Hydel | 41,700 | MW | | | |

