Electricity Reform in LDCs: Overview of Some Work in Progress

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Reforming Small Power Systems under Political Volatility: The Case of Nepal


Reform in Small and Politically Difficult Countries

- As of 2004, peak demand in:
  - 60 countries < 150 MW
  - 30 countries < 150-500 MW
  - 20 countries < 501-1000 MW

- Rapid demand growth an important factor

- Single-buyer model attractive
  - Not as simple as it appears
  - Not immune to political interference and corruption
  - In some respects demands more than other models from the regulator

- Shortage of expertise

- Incentive regulation of networks in systems with fast growing demand difficult
e.g. Nepal

- “Resource rich but policy poor”
- Political leadership change 11 times in 10 years
- State as owner and decision-maker
- Significant vested political interests
  ➔ Ineffective regulation and delays

- Nearly 20 years of ineffective reform
- World’s second hydropower rich country
- Only 0.72 GW of potential 40 GW developed
- High price subsidies
- 16.5 millions without power (electrification rate 43.6%)
- Net importer of electricity
- Foreign IPPS paid significantly more than domestic IPPs
Nepal (2)

- Unbundling contingent upon the sector reaching an adequate size
  - Transaction costs vs. Efficiency gains
    - Horizontal integration vs. Competition among many small generators
    - Vertical integration vs. Vertical Separation

- Effective regulation more important than unbundling

- Regulation should
  - Reduce the effect of political instability
    - Take the politics out of policy?
  - Manage tariff and subsidy restructuring
    - Build consensus around this
    - Don’t leave this entirely to private sector
A Three-Stage Reform?

➢ In the short run
   • Establish independence of regulatory body
   • Cost-reflective tariffs and subsidy restructuring

➢ In the medium run
   • Increase electrification
   • Reduce risks and entry barriers
   • Improve networks and access to them

➢ In the long-run
   • Vertical and horizontal unbundling
   • Competition
   • Privatization (and alternative public ownership forms?)
Reforming the Power Sector in Transition: Do Institutions Matter?


Introduction (I)

• Early 1990s: rapid changes in economic and political settings of transition economies (TECs) - CEB, SEE, CIS

• Coincided with power reforms around the world

• Two special reasons for electricity reforms in TECs:
  
  o A subsidised economy via low energy prices

  o Energy sector important aspect of the pace and direction of overall economic reforms
Introduction (II)

• Current status: Mixed outcomes, stalled reforms, and uncertainty
• Reformers vs. Non-reformers: Winner?
• Energy rich vs. Energy non-rich: Winner?
• Reform and Performance:
  – Policies did not understand the functioning of a market economy
  – Misunderstandings of the reform process
Relevant Literature (I)

• Power sector reform complicated ongoing process (Jamal et al. 2004)

• Market-based power sector reforms meaningful only in the presence of market based institutions (Hogan, 2001)

• Similar approaches led to different outcomes due to differences in institutional endowments (Hirschhausenaen and Wadel, 2001)
Relevant Literature (II)

- Neoclassical theory ignores the role of institutions and time in explaining market mechanisms (Rodrik et al. 2004; North 1971; Williamson, 1996)

- Norms, institutions, social capital, trust play critical role apart from prices (Arrow, 1972; Hirschman, 1992; Putnam, 1993; Fukuyama, 1995; Stieglitz, 1999)

- Electricity sector reform as a part of wider economic and institutional reform to be successful (Pollitt, 2009)

- Following Easterly and Levine (2003):
  - Reforms major effect on performance works through long lasting institutions
  - Reforms and institutions should reflect current know-how and political conditions of the power sector
Motive and Context of Reforms

• Non-OECD experience different from OECD reform experience in terms of reform drivers, sectoral contexts and institutional settings (Williams and Ghanadan, 2006)

• OECD reform experience driven by efficiency, competition and choice within the power sector itself, while non-OECD reforms primarily driven by financial reasons (Hattori and Tsutui, 2004)

• Factors external to power sector played major role in non-OECD electricity sector reforms
# Reforms: Push and Pull Factors

<table>
<thead>
<tr>
<th>Push Factors</th>
<th>Pull Factors</th>
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<tbody>
<tr>
<td><strong>Limited national fiscal ability</strong>: high public debt, utility borrowing as a major proportion of national debt</td>
<td><strong>Lending for institutional reform</strong>: macroeconomic stabilization lending conditional upon power sector restructuring, asset privatization (IMF), liberalisation and reform for new power sector loans (World Bank in 1993)</td>
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<tr>
<td><strong>OECD Deregulation</strong>: new energy multinationals created as a result of OECD energy sector deregulation, provided investment opportunities for Europe and USA</td>
<td><strong>Spill-over effects from international experiences</strong>: learning from pioneering reforms of power sectors in Chile, England and Wales and Norway in the 1980s and early 1990s</td>
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<tr>
<td><strong>Investments constraints of the power sector</strong>: no ability to self-finance, system upgrading and modernization required, high projected electricity demand</td>
<td><strong>EU accession</strong>: opportunities to benefit from regional integration by reforming the power sector in accordance to the EU Directives</td>
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*Table 1: Drivers of power sector reforms in TECs*

*Source: Own Compilation*
Data (I)

Reform Measures:

- Small scale privatisation Index
- Large Scale Privatisation Index
- Governance and Enterprise Restructuring Index
- Price Liberalisation Index
- Trade and Foreign exchange System Index
- Competition Policy Index
- Banking reform and Interest Rate Liberalisation Index
- Securities Markets and Non-bank financial Institutions Index
- Infrastructural Reform Index (separate for electric power, railways, telecommunication, roads, water and waste water)
Data (II)

- Economic Governance Reform Index (EGRI): large scale privatization and governance and enterprise restructuring
- Overall Market Liberalisation Index (OMLI): price liberalisation, competition policy and trade and foreign exchange system
- Other Infrastructure Reform Index (OIRI): roads, water and waste water and telecommunication
- Financial Reform Index (FRI): banking reform and interest rate liberalization and securities and non-bank financial institutions
- Power Sector Reform Index (PRI): power sector reform index alone
# Summary of Results

## Economic Performance

<table>
<thead>
<tr>
<th>Metric</th>
<th>Result</th>
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<tbody>
<tr>
<td>Per capita GDP</td>
<td>• Positively affected by reforms in other infrastructure sectors,</td>
</tr>
<tr>
<td></td>
<td>• economic governance and overall market liberalization</td>
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<tr>
<td>Per capita electricity production</td>
<td>Positively affected by overall market liberalization</td>
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## Technical Performance

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<th>Metric</th>
<th>Result</th>
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<tr>
<td>Per capita installed capacity</td>
<td>Negatively affected by economic governance</td>
</tr>
<tr>
<td>Per capita transmission and</td>
<td>Positively affected by overall market liberalization</td>
</tr>
<tr>
<td>distribution losses</td>
<td></td>
</tr>
<tr>
<td>Energy Intensity</td>
<td>Positively affected by economic governance</td>
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## Environmental Performance

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<tr>
<th>Metric</th>
<th>Result</th>
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<tbody>
<tr>
<td>Per capita renewable electricity</td>
<td>Positively affected by financial sector reform</td>
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<tr>
<td>production</td>
<td></td>
</tr>
<tr>
<td>Per capita renewable installed</td>
<td>Positively affected by financial sector reform</td>
</tr>
<tr>
<td>capacity</td>
<td></td>
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<tr>
<td>Carbon emissions intensity</td>
<td>Negatively affected by reforms in other infrastructures</td>
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Conclusions and Lessons Learnt

• Implementation of reforms rather weak to influence any outcome significantly

• The complexities and intrincacies of power sector reform as a part of wider economic reforms was not understood and largely ignored

• The link between power reforms and outcomes not as linear as policymakers would have liked.

• Priority driven reform based on individual capacity, resources and needs more desirable than theory driven reforms.

• Need to consider other sectoral reforms rather than relying on the pace and sequencing of power reform alone.