Identifying what works – Successes in financing energy access

Identifying successful solutions adopted in developing countries to deliver energy access, the financing mechanisms used and how to scale up efforts

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Total Primary Energy Supply (Mtoe)

	1990-91	2000-01	2010-11 (Prov.)
Coal	101.4	150.0	268.6
Oil	60.5	110.6	150.0
Gas	11.5	25.1	65.2
Nuclear	1.6	4.4	6.9
Hydro	6.2	6.4	10.3
Renewable	0	0.1	1.0
Biomass & Waste	122.2 *(40.3%)*	136.6 *(31.5%)*	160.0 *(24.2%)*
Total	**303.4**	**433.2**	**662.0**

Per Capita Energy Consumption

India	1990-91	2000-01	2010-11
TPES tons/Capita	0.36	0.43	0.56
Electricity Consumption Kwh/Capita	324	515	640

Projected Per Capita consumption in 2031-32 @ 8% GDP Growth Rate

Total Primary Energy 1.50 tons	Electricity 2471 KWh

In Selected Countries in 2008	TPES Tons/Capita	Electricity Kwh/Capita
World Average	1.83	2782
OECD	4.56	8486
China	1.60	2456
South Korea	4.67	8853
USA	7.50	13647
Japan	3.88	8072
France	4.16	7703

Distribution of Households by Source of Lighting(%)

	2001 Census			2004-05 NSS 61st Round			2009-10 Estimate
	Total	Rural	Urban	Total	Rural	Urban	Total
Electricity	55.8	43.5 (31.3)	87.5 (24.5)	65.2	54.9 (39.8)	92.3 (25.4)	72
Kerosene	43.3	55.6 (40.1)	11.6 (3.2)	34.1	44.4 (32.2)	7.1 (1.9)	27.5
Others	0.9	0.9	0.8	0.7	0.7	0.6	0.5

Figures in brackets indicate percentage of total households

Distribution of Households with Type of Fuel Used for Cooking (%)

	2001 Census			2004-05 NSS 61st Round			2009-10 Estimate
	Total	Rural	Urban	Total	Rural	Urban	Total
Firewood & Waste	72.3	90.0 (64.8)	26.8 (7.5)	66.9	84.1 (61.0)	21.7 (5.9)	55
Kerosene	6.5	1.6 (1.1)	19.2 (5.4)	2.8		10.2 (2.8)	1
LPG	17.5	5.7 (4.1)	48.0 (13.4)	21.9	8.6 (6.2)	57.1 (15.7)	40
Others	3.7	2.7	6.0	8.4	7.3	11.0	4

Figures in brackets indicate percentage of total households

Systems in Place for Providing Cooking Fuels

- Government continues to provide large universal price subsidies for kerosene (through PDS) and LPG (sold by dealers working with state oil companies) with the intended aim of shifting fuel consumption pattern from biomass to cleaner fuels

- It is a **universal or non-merit subsidy** and is available to all in unlimited quantity largely facilitating in saving the fuel cost for the relatively affluent and a burgeoning urban middle class.

- There is no separate scheme targeting BPL families at the country level. However, two state governments have started schemes to provide free LPG connection to BPL families. Deepam Scheme launched in 1998 by Andhra Pradesh Government benefitted more than 1.5 million poor households and Government of Tamilnadu started similar scheme in 2006 benefitted around 2.9 million households by March 2011.

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Systems in Place for Providing Cooking Fuels...(Contd.)

- Though private players, also called parallel marketers, were introduced in 1993, cater to the needs of commercial sector. They cannot establish themselves to serve domestic sector as long as government provides subsidy to public sector companies.
- A number of urban households cook with kerosene, rural households tend to use it predominantly for lighting
- Around 4.2 million Family type biogas plants have been set up in rural areas to provide cooking gas

Challenges in Enhancing Access to Energy

- The NSSO surveys of household (61st) during 2004-05 indicates that a large number (around 53%) of households in high income States have stopped using PDS kerosene since 1999-2000, the actual reduction in kerosene allocation has been substantially less – 12.8% against the estimated decline of 32.6%. (Chaturvedi and Parikh Committee).

- The biggest problem however is to devise an effective subsidy mechanism for distribution of these fuels .As, subsidies usually tend to be more effective in case of energy services that are provided through fixed networks like electricity, natural gas etc. and are really challenging to devise in case oil products that are freely traded and are difficult to target

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Challenges in Enhancing Access to Energy…..(Contd.)

- **Rural Markets**
- Lumpiness of LPG purchase in terms of start up cost cash outlay for each refill presents a serious barrier to the uptake and regular use by low income households
- Low population density, poor road infrastructure, low LPG uptake make it difficult to establish commercially viable LPG distribution network. This lack of economies of scale in catering to rural domestic consumers is one of the main factors hindering ready access to LPG.

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Challenges in Enhancing Access to Energy…..(Contd.)

- The lumpiness of LPG purchase can be addressed by providing smaller cylinders but international experience with such cylinders is mixed: the negative aspects of small cylinders include (a) a much higher cost of cylinder management and hence higher per unit cost (b) the need for households to refill more frequently.

- Rampant diversion of domestic supplies of kerosene and LPG to the black market leading to a large portion of subsidized fuels not reaching the targeted beneficiaries

Systems in Place for Providing Electricity

- Electricity distribution in India is predominantly owned and operated by the public sector entities except in urban centers like Delhi, Mumbai, Ahmadabad, Surat and in Orissa state since 1996, which covers rural areas also.
- Considering only 44% rural households having access to electricity (2001 census), Government started Rajiv Gandhi Vidyutikaran Yojana (RGGVY) in 2005 to provide access to all rural households by the end of Eleventh Plan (2012) by creating rural electricity infrastructure.
- Below poverty line (BPL) households are given connections free of charge.
- 90 percent capital subsidy is provided by the Central Government under the scheme, balance 10% is to be contributed by the State Government as a stakeholder in the scheme through its own resources or loans from financial institutions.

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Systems in Place for Providing Electricity.....(Contd.)

- With an investment of Rs. 253.38 billion under RGGVY programme from 2004-05 to 2010-11, around 96,562 un-electrified villages have been electrified, distribution network of 189,589 villages have been strengthened and around 16 million BPL households have been electrified. Impact of this is expected to enhance the level of access to rural areas considerably.

- Government has also electrified around 8000 remote villages/hamlets with renewable source of energy where extension of gird power supply is un-economical under the Remote Village Electrification programme (RVEP) of Ministry of Renewable Sources of Energy (MNRE). 90% of the funding is provided by the MNRE similar to RGGVY scheme.

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Systems in Place for Providing Electricity.....(Contd.)

- The Electricity Act, 2003 has given a thrust to distributed generation in the context of rural electrification and such projects are exempted from licensing and licensee related obligations.
- MNRE has employed a mix of mini grid/of-grid options under this provision using mini-hydro plants, solar PV technologies, small scale biomass gasifies for generating electricity in rural areas and provides many incentives including capital subsidies up to 90 percent, tax holidays, accelerated depreciation and low interest loans.
- Regulatory regime mandates distribution utilities to purchase certain percentage of electricity from renewable sources

Issues in Electricity Sector

- Electricity supply to domestic and agriculture consumers are subsidized and part of the revenue losses are recovered by cross subsidizing from the industrial and commercial consumers.
- Aggregate technical and commercial losses of state utilities continue to be higher than desired level because of which the state utilities incur huge losses.
- Revenue sustainability of the villages electrified under RGGVY and RVEP is a critical issue, due to constraints like improper billing, inefficiency in collection payment, un-authorized connections etc. However, there are examples of success stories where franchisees like NGOs, self help groups, cooperatives, individual entrepreneurs or Panchayati institutions are able to manage and maintain the systems efficiently.
- Inadequate availability and poor reliability of electricity supply in rural areas in some states due to overall peak and energy shortages in the country is a critical issue

Dynamics of Fuel Choice Decision

Commonly reported fuel switch is fuel wood to kerosene/LPG, which depends on

- Actual cost of fuel wood for cooking (more than half of the households collect it freely)
- Strongly affected by level of income – to support start up and refill costs
- Government policy on the level of subsidy on kerosene/LPG
- Use of Kerosene for lighting mostly in rural areas will depends on the pace of village and household electrification

Way Forward

For Cooking

- Government has launched a scheme to release 55 million new LPG connections till 2015 to reach 160 million customers (out of the total 230 million) with most of the new connections being released in rural areas. Of about 10 million connections to be released each year, it is expected that number of BPL families will be on an average around 35 lakh every year.

- The budgetary requirement for implementing this scheme works out to Rs. 4900 million per year and is to be operated by public sector oil marketing companies, who will share the burden of subsidy by making provision of funds under the Corporate Social Responsibility Scheme.

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Way Forward….. (Contd.)

- Government launched "Rajiv Gandhi Gramin LPG Vitrak (RGGLV)" scheme in 2009, which aims at setting up small size LPG distribution agencies in order to increase rural penetration and to cover remote as well as low potential areas to realize the target of new 55 million connections by 2015. The scheme focuses initially on 8 states covering 1200 locations where the reach of LPG is very low.

- Government has to come forward with a roadmap by March 2012 towards direct transfer of cash subsidy to BPL households to buy kerosene/LPG at prevailing market prices. This move is aimed at eliminating the diversion of subsidized fuels and to ensure that benefits reach the targeted groups

Successes in Financing Energy Access in India

- Existing regulatory and financial measures to enhance energy access to households are predominantly supported and managed by public sector
- Private companies are licensed to market fuels carrying no subsidies, mostly to commercial sector
- Efforts to enhance energy access need to focus on:
  - Improving the overall efficiency of energy sector management
  - Providing level playing field to private players with public sector
  - Targeting subsidies to enhance welfare of poor sections
  - Making energy services affordable

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Successes in Financing Energy Access in India…. (Contd.)

- Rajiv Gandhi Gramin LPG Vitrak scheme will address the issue of economies of scale in catering to rural markets
- Release of 55 million new LPG connection till 2015 will proportionately reduce the health impacts of household fuel wood use
- Direct cash transfer scheme to BPL households for purchase of fuels at prevailing market prices will encourage private players in providing energy services and enhance the level of competition

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Successes in Financing Energy Access in India…. (Contd.)

- Existing option to increase electricity access focuses on enhancing centralized generation and efficiency improvements in the distribution sector

- Utilities have already started franchising certain services like metering, billing and collection or franchising total operation and management of a particular urban area. Significant participation of locals can lead to impressive results

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Successes in Financing Energy Access in India…. (Contd.)

- Decentralized Distributed Generation option also has been used in some rural areas where grid supply extension is commercially unviable
- This has facilitated in creating gainful employment opportunities to the locals
- Combining generation and distribution will be potentially an important part of solution to encourage private players in providing electricity services both in urban and rural areas

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Successes in Financing Energy Access in India

The entrepreneur managing the combined generation and distribution facility can be supported:

- By extending capital subsidies under RGGVY to (i) strengthen distribution and (ii) promote DDG (Decentralized Distributed Generation) to be extended to localized Generation and Supply

- Second option is to have Viability Gap Funding in the form of Operating Subsidies that is competitively determined can bridge the financial viability gap

Thank You