Energy sector reforms and rural energy – will the rural poor benefit?

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Abstract
In India, at present, the poor people in the rural areas are constrained in energy use, both in terms of quantity and quality, with limited access to modern forms of energy (electricity and gas). At the same time, the changes in the energy sector policy in India are directed towards the liberalisation of the sector, but what would happen to the partially served and un-served rural areas, which are either too poor, or too isolated to attract private sector energy-related investments? The current challenge in the Indian energy sector is maintaining the balance between the issues - of commercial viability of the energy sector (from economic perspective); and, of equitable access to modern energy carrier services among the rural poor (from political and governance perspective). The paper is based on empirical evidences from the case studies of – Kalahandi, Orissa; Sundarbans, West Bengal and Bastar, Chattisgarh – underlying the issue of energy access and the inter-linkages with the local institutional systems in enabling access. The paper brings out five key issues of energy access (electricity – conventional and non-conventional and petroleum fuels) in the rural areas in the context of the energy sector reforms – (a) role of government; (b) barriers in transition to modern energy carriers; (c) preference on consumptive rather than the productive uses; (d) affordability; and (e) effectiveness of the energy sector reforms policy to address the social and public benefits.

Keywords: Rural energy access, modern energy carriers, energy poverty, energy reforms, India
1.0 Introduction

The present changes in the Indian energy sector policy are directed towards providing better energy services and hence improved access, by allowing competition in the market. The assumption is that these will lead to technological advances, and institutional and financial innovations in providing energy services, which will also benefit the poor. However, in their present form it is likely that these policy level changes will expand and serve the better-off users, who already have access to these forms of energy and technologies. The current challenge in the Indian energy sector is to find a fair balance between – issue of commercial viability of the energy sector; and, the issue of equitable access to modern energy fuels services among the urban and rural poor where there is no access or access is limited (Dubash and Chella Rajan, 2001; Sankar, 2002). If the commercial viability were not reached, then it would have negative economic implications and add to the government’s budgetary deficits. If the government fails to provide access across various social and economic population groups, then it would face negative political implications; risks that no democratically elected government can afford to take.

In India at present, the poor people in rural areas are constrained in energy use, both in terms of quantity (insufficient to meet their needs) and quality (fuels with poor combustion properties and negative health impacts) (WEC/FAO, 1999). Access to modern forms of energy (electricity and gas) is limited, and in some regions, even access to biomass fuels is limited (Reddy, 1999; Venkata Ramana, 1998; WEC, 2000; WEC/FAO, 1999). The lack of access to modern energy services (box 1) is linked to low demand density; poor delivery infrastructure; and, most important of all the dependency on subsistence economy, which does not provide sufficient leverage for the purchase of modern energy fuels or technologies and therefore the modern energy services).

<table>
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<th>Box 1. Modern energy services</th>
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<td>The study defines modern energy services as consumptive (lighting, heating and social benefits) and productive (contributing to economic activities) uses derived from the use of electricity and petroleum products.</td>
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The access to modern energy carriers becomes more important as the country has initiated an energy sector reforms policy. The energy sector reforms in India over the last one decade has focussed on reduction of the role of state, introducing the private sector in the market once exclusively reserved for state owned enterprises and gradually liberalising control. The process of the reforms is different in the electricity and petroleum sector. The study focuses on the reforms in the downstream supply and distribution in the sector, as this would have implications on access in the rural areas.

The paper therefore stresses on understanding the potential and constraints of the reforms in the energy sector as a means to facilitate improving access to modern forms of energy in rural areas. Section 1, provides an overview of the current debate on energy access in rural areas and the current situation of rural energy access in India. Section 2 discusses the reforms in the electricity and petroleum fuel sectors as part of the energy reform policy in India. In the section 3, the links between the energy reforms (distribution) and improving access in rural areas to electricity and petroleum fuels are discussed. The final section (section 4), discusses the key issues that are emerging in the discussion on energy reforms and rural energy access.

1.1 Energy access in rural India

The availability and use of modern energy carriers in the rural areas for different energy services is limited and in the rural areas of India, biomass fuels are the predominant source for meeting the energy needs, especially the thermal requirements of cooking. In the last few years, the use of biomass fuels for cooking has decreased, however this trend is very small. Table 1 shows the shift in the energy use pattern in the households between 1991 and 2001. The table shows data from two different sources, the Census of India (in 1991 and 2001) and the energy use survey done by the National Sample Survey Organisation in 1993-94 and 1999-2000. In 1999-2000, 75.5% of rural households were meeting their cooking needs from fuelwood, compared to 78.2% in 1993-94 (NSSO, 1997; NSSO, 2000). The census results show a slower decline on fuelwood use across the rural areas of India. However, the most significant transition is in the use of LPG for cooking, which has increased from 1.2% in 1991 to 5.7% in 2001 (GoI, 1995; Gol, 2003). The increase can be contributed to two factors – (a) ease in availability of LPG in the rural areas, as part of the step taken
by the government to release pending LPG connections between 1999-2000; and (b) surrendering of the kerosene oil quota against new LPG connections in some of the states. In addition, the involvement of the private sector gas companies in marketing of LPG, has improved the availability of LPG in the rural areas. However, there is still room for improvement. Poor delivery infrastructure, high cost of connection and refill, and availability of competing fuel choice in form of fuelwood and other biomass fuels at zero financial cost, are the main barriers for slow diffusion of LPG in the rural areas (Reddy, 1999; Sinha et al., 2003).

Table 1. Distribution of rural households (percentage) by energy carriers used for cooking and lighting

<table>
<thead>
<tr>
<th>Energy carriers</th>
<th>Cooking</th>
<th>Lighting</th>
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<tr>
<td></td>
<td>1991&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1993-94&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Fuelwood</td>
<td>71.7</td>
<td>78.2</td>
</tr>
<tr>
<td>Cowdung cake</td>
<td>19.6</td>
<td>11.5</td>
</tr>
<tr>
<td>Crop residue</td>
<td></td>
<td>13.1</td>
</tr>
<tr>
<td>Coal/soft coke</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>LPG</td>
<td>1.2</td>
<td>1.9</td>
</tr>
<tr>
<td>Biogas</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Kerosene</td>
<td>1.3</td>
<td>1.6</td>
</tr>
<tr>
<td>Electricity</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>Solar energy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>7.7&lt;sup&gt;f&lt;/sup&gt;</td>
<td>7.4&lt;sup&gt;f&lt;/sup&gt;</td>
</tr>
<tr>
<td>No cooking/lighting</td>
<td>0.7</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Note: a. Census of India 1991; b. NSSO 1997; c. NSSO 2000; d. Census of India 2001; e. the Census 1991 did not give the percentage of rural households using kerosene oil, but since electrification was low it was assumed that more than 65% of the rural households were using kerosene oil for lighting; f. NSSO survey included biogas, coke/soft coke and electricity as other fuels

Providing access to electricity in the rural areas has been a programme objective of the government to improve the quality of life and provide local economic opportunities. In terms of village electrification nearly 86.6% of the villages have been electrified. However, village electrification, the way it has been defined does not project the true picture of the actual number of households that have access to electricity. In the rural areas, petroleum fuel, mainly the kerosene oil is most commonly used for lighting. However, in the last ten years the use of kerosene oil has decreased consumerate to the increase in the number of households using electricity.
The 2001 census shows that nearly 56% of the rural households still use kerosene oil (GoI, 2003). The number of households using electricity has increased from about 31% (1991) to about 44% in 2001 (GoI, 2003). We can therefore conclude that while the government utilities have done a good job in reaching such geographically extensive number of villages, there has been a failure to realise these achievements into gains for consumers.

The distribution of modern energy fuels has been the responsibility of the government owned or public sector utilities. Electricity distribution was the responsibility of the state electricity boards. Distribution of petroleum fuels, involved the state government established distribution channels (for kerosene oil, through Fair Price Shops, under Public Distribution System) and the public sector managed dealer and retailer network for marketing of LPG, diesel and petrol. The experience of public and state utilities delivering energy services have not been effective in improving access in rural areas, as large percentage of rural population either remains un-served or under-served. An argument, which has emerged from the international financial institutions such as World Bank, for limited access, is the role of the government in delivering energy services and its policy to provide subsidies (Bacon and Besant-Jones, 2001; Tellam, 2000). The emerging alternative approach is in the form of energy sector reforms, which emphasizes that the market forces should govern the energy sector and that the market should decide the prices and the strategies for implementation, and not the government (World Bank, 2000).

However, there is a growing sense of dichotomy when we talk about the energy access and energy reform policy. On the one hand there is recognition that people living in the rural areas of India have limited access to modern energy services and as a result limited economic opportunities and limited quality of life. Access to modern form of energy and energy services is considered essential (an argument for sustainable energy options) for improving the economic conditions of people and in turn their quality of life. On the other hand we are pushing a reform policy agenda, which is primarily driven by financial considerations (inflow of private investment, market-driven functioning, etc.) and then by efficiency consideration, which are likely to result in exclusion of the public benefits such as access to modern energy services for betterment of quality of life and economic development.
2.0 Energy sector reforms

Amidst the structural adjustment programmes and reforms in India, which were initiated in the wake of the economic crisis of the early 1990s, the reforms in different infrastructure sectors - energy, banking, telecommunication, etc. - were initiated. The government ownership of the sector was based on the grounds of natural monopoly and public service, and the continued involvement of government was questioned in the context of their performance and achievement (Dubash and Chella Rajan, 2001). The driving forces for the changes were essentially focused on new investments, the importance of improving performance efficiency, and the need to move away from the traditional approach of providing highly subsidized infrastructure services. The need and the process for reforming the electricity sector and the petroleum sector were distinctly different. In case of electricity, the reform that we see today resulted out of the failure of the Independent Power Producers (IPP) strategy, which had its emphasis on capacity addition by involving the private sector. In the case of the petroleum sector, the reform process was in the form of de-regulation, initiated due to need to support the growing fuel demand and at the same time the growing oil pool deficit.

2.1 Electricity sector reforms

In India at the time of India’s independence, the electricity generation and distribution was very much in the hands of small and distributed private sector. As part of the overall developmental policy which originated in the post-independence years, the shift towards centralised infrastructure emerged, which was also implemented in the Indian electricity sector. State electricity boards with vertically integrated generation, transmission and distribution functions came into existence. The government also initiated the rural electrification programme, which meant extension of grid electricity for electrification of villages and electricity for initiating economic activities in the rural areas. While the electricity access was part of the overall social goals of the government, the end of 1970s and early 1980s saw the emergence of populist measures, with reduced electricity tariffs, flat rate tariff, cross-subsidy and then in early 1990, even more generous schemes of free electricity. The net effect of the populist measures and the continued grid expansion resulted in inefficient distribution
system, with even more inefficient revenue collection system, leading to poor financial health of the state electricity boards.

The post-1990 economic reform policies therefore included the strategy for attracting private sector investment in the generation sector or the IPP strategy. The euphoria over the IPP strategy soon died, with different stakeholders realising the high cost of power from these new power plants. However, as the IPP strategy proceeded it became increasingly clear that while the private sector was interested to invest in the generation, they were reluctant because they had to sell the electricity to the state electricity boards, which were already making financial losses. The inefficiency in the Indian electricity sector was aggressively pursued by the international funding agencies, which linked the investment in the energy generation to restructuring of the state electricity boards ((Dubash and Chella Rajan, 2001; Rajan, 2000; Tellam, 2000). As a result of the policy level changes, a common minimum action plan for power reforms was approved in 1996. The electricity sector reform model that emerged in India is given in Box 2.

**Box 2. Electricity sector reform in India**

- Unbundling and structural separation of generation, transmission and distribution;
- Private sector participation in generation and transmission utilities;
- Privatisation of generation and distribution;
- Competitive bidding for new generation;
- Establishment of autonomous regulatory body;
- Reform of electricity tariff at the bulk power, transmission and retail levels
- Distribution reforms which involves governance reforms and tariff reforms

The restructuring of the electricity industry meant unbundling of the vertically integrated state owned electricity utilities into separate generation, transmission and distribution utilities, first by corporatisation and then privatisation and formation of a regulatory authority (Hunt and Shuttleworth, 1996; Sundar and Sarkar, 2000; TERI, 1999). The experience of privatising the distribution is a recent one and comes from Orissa where the electricity distribution was privatised by forming four distribution companies in 1999. In the other states where the restructuring has been undertaken,
the distribution has not been privatised (with exception of Delhi), instead separate distribution corporations have been formed. However, these corporations continue to remain under the control of the state government.

2.2 Petroleum sector reforms

The oil industry in India was operating as a free market till the first oil crisis in 1973 and many of the multinational oil companies such as Shell, Caltex and Esso had a significant share in the market. Nationalisation of industries along with other sectors as part of the government initiative resulted in the private players being bought out by the government. Since then, state owned public sector enterprises or national oil and gas companies play a dominant role in the sector. At the central government level the policy and regulation is mainly carried out by the Ministry of Petroleum and Natural Gas (MoPNG). The government in 1975 set up the Oil Coordination Committee (OCC), providing support to the government in policy decisions and their implementation, and in sense acting as the regulator (Sundarajan 2000). OCC’s role was to plan and regulate the sector and to ensure availability of products in the market as per the share of the different oil companies. The petroleum sector is divided into upstream (exploration, production and import) and downstream (refining and marketing). And since the national oil companies had marketing plans, which were monitored by the OCC, it allowed expansion of the infrastructure without any duplication. The government through the sales plan of the national oil companies controlled the development of retail marketing network, enrolment of LPG customers, kept a ceiling on distributor’s refill sales, kerosene quotas and commission for dealers and distributors (Sundarajan, 2000).

The reforms in the petroleum sector were home grown, as the oil pool account started to show deficits, the government had to pay to national oil companies to ensure continuous availability of petroleum products in the market. As the level of the deficit reached Rs 18000 crore in 1997 (GoI 1999), the government formulated expert committees, which recommended the dismantling of the Administrative Pricing Mechanism (APM). The dismantling of APM then became part of the deregulation policy. The de-regulation policy was initiated in 1992-93 itself when the government allowed the parallel marketing of petroleum products - kerosene oil and LPG - in
order to increase their availability and also increase competition (Sundarajan, 2000). In addition the government also decontrolled certain petroleum products, which allowed international oil companies to re-enter the Indian market. The de-regulation policy adopted by the government is shown in Box 3.

**Box 3. De-regulation in the petroleum sector**

- Decontrol of products such as lubricants in 1992
- Parallel marketing scheme in 1993 allowing private sector to develop their own infrastructure and import facilities to market LPG and kerosene
- Special licenses for importing products
- Opening of the refining sector
- New exploration and licensing policy (NELP) in 1997 to attract investments for exploration of oil and gas reserves
- Dismantling of APM
- Disinvestments in the national oil companies

Even before the APM was dismantled, the government had opened the Kerosene oil and LPG market to the private sector, under a scheme called parallel marketing scheme (PMS). However, the private sector participation came with some conditionality, which protected the public sector oil companies and their market. In order to distinguish the subsidised kerosene oil sold through PDS it was dyed blue, while the kerosene oil under the PMS was kept white. In the case of LPG, the private companies under PMS were not allowed to market the “standard” cylinder size (14.2 Kg) used by the national oil companies and they were also not allowed to obtain a subsidy. In 1999, the government allowed the national oil companies to clear their 9-year old backlogs of waiting consumers; thereby they were able to add 9.3 million LPG consumers to their clientele. So while the market was opened, the government through its interventions created an imperfect market condition, which was favourable to the national oil companies. In line with the de-regulation policy, the government dismantled the APM in 2002. OCC has been dismantled along with the APM, and a new petroleum regulatory body would assume the regulatory functions. A draft petroleum regulatory bill has been tabled in the parliament in 2002. However, while the APM has been dismantled, it has not been done as planned. The government still fixes the end-user price of LPG and kerosene oil, and also a fixed amount of subsidy
per LPG cylinder and per litre of kerosene oil to the national oil companies. The national oil companies cannot change the consumer price and they pay the differential subsidy.

**2.3 Energy reforms – reflection**

If we look at the present energy reforms in India, they represent the un-doing a mix of programmes, strategies and populist measured the government initiated from the 1970s onwards.

?? In the case of petroleum fuels, the policy of controlled products (rationed allocation and reduced prices) aimed to ensure equity of access across different sections of the society. The programme worked well till the changes in the international market and policies, and no increase in the domestic prices, resulted in increasing the deficit under the oil pool account. The initiative to dismantle the APM has come with a great degree of reluctance by the government and opposition political parties, since it marks a failure of its policies. These policies though mooted under a pro-poor agenda, made little impact in terms of access by the poor.

?? In the case of the electricity sector, it was the political interventions at the regional level in the late 1970 (the horsepower based billing for agriculture). In the 1980s the emphasis on grid expansion, *Kutir Jyoti* (single light point scheme) and de-metering, resulted in the poor financial status of the SEBs. In states such as Tamil Nadu free electricity was provided to the farmers from early 1990 till 2003 and in Punjab from 1997 till 2002. In states such as Karnataka, electricity sales to the agriculture became an instrument to hide the distribution losses and show it as agricultural sales.
3.0 Energy reforms and rural energy

The energy reforms policy in India is based on market principles to improve the financial health of the energy sector. There has been a significant emphasis on price correction, by phasing out subsidies. The social aspects and public benefits of enhancing access for public benefits and especially that of the un-served and the underserved is not on the energy reforms agenda. It was assumed that the market forces would bring savings to the exchequer and the government would be then able to channel the resources into development initiatives, an argument that has been strongly advocated for initiating energy sector reforms (World Bank, 2000).

3.1 Reform and rural electricity access

Rural electrification in India has always been measured in terms of physical targets of villages electrified or pump sets energised and since this matched the programme goals, there was very little emphasis given on the quality of power supply. The problem of rural electrification is both from the supply side of the utilities (state or private) and from the consumer side. The cost of supply of electricity to the rural areas is more than the revenue generated. The actual physical size and extent of the grid has in itself become problematic, particularly in terms of maintenance. This has had a negative effect on the system efficiency, eventually leading to technical and financial losses. The rural loads are mostly for lighting and are small and dispersed in nature. In the villages of Bastar and Kalahandi, more than 60% of the rural connections are for single light point Kutir Jyoti (KJ) connections (Sinha et al., 2003). The extension of the grid has also given an opportunity for pilferage of electricity. In Kalahandi, it is estimated that for every single KJ connection, there are two illegal connections (XIM, 2001). The other problem faced by the utilities is they find that selling electricity to the rural areas is not commercially attractive. Because of the load factor based billing and removal of electricity meters, the rural billing to electricity input ratio is low. The problem is compounded by a poor collection to billing ratio, due to errors in preparing bills and laxity in collection. In addition, the problem of electricity being provided for free or projected as free (for the KJ connections) by the political parties and their candidates has resulted in even poorer revenue collection. Since disconnection has far more political implications the
electricity utilities (both private and public sector) have not been able to take such steps.

The opposite end of the spectrum of the rural electricity supply is the problem faced by the users. The rural consumers get **poor service** and hence have often resisted paying for electricity. The rural electricity supply is **un-reliable** and of **poor quality**. There are frequent power cuts and the voltage is poor. One of the reasons for poor quality is also the **pilferage in collusion** with the field staff of the electricity utilities and inability of the utilities to control the thefts. Yet another problem is that of **improper billing** which has had a significant negative impact on revenues. In Kalahandi, the rural domestic user pays 20-30% extra energy charges, because of the bi-monthly billing and the system of billing (calculating energy charges) on load factor, which acts as a disincentive to pay and to invest in endues efficiency improvement. In the recent few years billing and collection system has improved. In the past bills for several months were sent together and since meters were removed in 1980s in most of the rural areas, billing was always on average consumption and based on the load factor. In case of the agriculture sector, the power supply is given for nine hours a day (there is state to state variation), but the supply hours are staggered and uncertain. The farmers therefore do excessive water pumping and as the billing is on a pro-rata basis (Rs per horsepower [hp]), there is limited initiative by the farmers to invest in **efficiency improvements**.

### 3.1.1 Impact of reform on rural electrification

So are the programme of rural electrification and the rural electricity consumers likely to benefit from the energy reforms? The distribution reforms in India only began in 1999, and while it may appear to be too early to evaluate its impact, there is no doubt that it is the most opportune time to understand the effect of the changes and make necessary changes. The problems, which plagued rural power distribution before the reform policy and measures were initiated, continue to be there. However, the electricity sector reforms have brought an increased focus on the rural electrification. There are a number of early positive steps taken by the central and the state government can be beneficial in improving access to electricity –
(a) improving physical access to electricity in the un-electrified villages and households, accompanied by shift in the policy to promote distributed generation and decentralised distribution, and

(b) additional financial assistance to the states to improve and strengthen the distribution system and reduce distribution losses.

On the other hand, the experience of privatising the distribution in Orissa has not exactly lived up to the expectation.

**Access:** The government has included electricity as one of the “basic minimum service” for rural development. The government has also initiated a national policy - “Power for all by 2012” – and to meet this goal there is an additional Central Financial Assistance (CFA) under the rural development schemes and new schemes such as Accelerated Rural Electrification Programme (AREP). The goal of the policy is to complete village electrification by 2007 (remote villages using renewable by 2012) and all households by 2012 (MoP, 2001; MoP, 2003; MoP, 2003a; Planning Commission, 2002). The funds come from the central government. The state governments have to develop their respective rural electrification plan, to contribute to meeting national goals of providing connectivity to new villages or connections to un-electrified households in the electrified villages.

**Distributed generation, decentralisation and renewable energy:** In order to meet the goal of village and household electrification, the government is focussing on distributed generation and decentralisation. Electrification of nearly 18000 remote villages will primarily be done using renewable energy resources (Planning Commission, 2002). The Gokak committee on Distributed Generation in its report emphasises that decentralised renewable energy technologies should be used (if viable) even in rural areas where grid can be extended for effective management of rural power distribution (MoP, 2002; MoP, 2003a). The renewable energy technologies for rural electrification get supported from - the environmental consideration under the energy reforms and the economic and efficiency considerations under distributed generation. The argument for distributed generation is supported by the experience of the electricity cooperative managing projects in Gosaba and Sagar islands in West Bengal. The evidence from here is that local
institutional arrangements can effectively manage electricity distribution and revenue collection. For example, in order to address the problem of households not paying for electricity, pre-paid cards have been introduced. The pre-paid cards will also help the consumers to use electricity as per their purchasing capacity.

**Strengthening distribution through improved finances:** The government has initiated schemes such as Accelerate Power Development and Reforms Programme (APDRP) to improve and strengthen the distribution systems. The programme would finance utilities for upgrading distribution lines, transformers, installation of meters, etc., in order to improve the quality of power supply and check theft and losses (MoP, 2003b; MoP, 2003c).

**Strengthening distribution through privatisation:** The experience of privatising electricity distribution in the rural areas of Orissa has largely not been successful. The Shovan Kannungo Committee that was set up by the Government of Orissa to study the progress of electricity reforms has stated, “unintentionally the rural electrification has become the worst casualty” (Kannungo Committee Report, 2001). The targets of expanding access and improving services by better management skills of private distribution companies have not been met. The most notable change has been an increase of tariff every year. The distribution losses have not been brought down and theft has not been eliminated. The private distribution companies have not initiated or proposed new schemes since 2000 for expanding access to electricity in rural areas. The evidence found in this study in Kalahandi district shows that there have been little improvements in services to the rural areas. The perception of the rural consumers is that it does not make any difference if the government or private utility is selling electricity. In some villages, households with single-light point connection (a social programme of the government) have been disconnected. Metering of households is very slow and load factor billing is continues. The problem of poor quality and unreliable supply continues in the rural areas of Orissa.

One positive development, seen in Orissa is the formation of Village electricity committees or Village Bidyut Sanghas (VBS) in the electrified villages. The VBS’s are an interface between the distribution company and the consumers. The VBS facilitates the distribution company by undertaking consumer education to convert
illegal connections into legal connections, metering, meter reading, bill distribution and in revenue collection. For the consumers the VBS acts as an interface to handle the consumer complaints and speedy handling of the complaints by the distribution company. The VBS is an elected body from amongst the electricity consumers from the villages, and are supported by the distribution company and a team of dedicated professionals managed by Xavier Institute of Management, Bhubaneshwar. The long-term strategy is to encourage participation of local entrepreneurs, as a franchisee, to take up the management of power distribution for a set of villages and other electricity consumers. The franchisee would handle the commercial aspect of rural electricity distribution with the help of the VBS, whereas the distribution company would provide the technical support.

3.2 Reform and rural petroleum fuel access

The distribution of the petroleum products has traditionally been under the control of the state owned distribution system or the distribution of the national oil companies. In the rural areas because of poor transportation infrastructure, the availability of modern energy carriers such as LPG has been limited. The problem of the rural petroleum market is both from the supply side and from the demand side. The need to shift the supply of kerosene oil under the PDS as an essential item to be sold at a subsidised price was based on the assumption of creating access across different sections of the society. The evidence shows that in reality the economically weaker section of the society continue to have restricted access and do not benefit from the subsidy. The distribution of kerosene oil through the PDS has multiple agencies involved and has therefore provided opportunities for the pilferage and diversion of the kerosene oil to the open market or the black market, and sold at higher prices. In the last five years (since 1997) with the phasing out of subsidies, the price of kerosene oil under the PDS has increased three times, while there has been not much change in the purchasing capacity. The most affected consumers have been the low-income households or the households, which depend upon daily income sources. Their problem is compounded by the fortnightly or monthly distribution of kerosene oil. As a result the uptake of kerosene oil in the rural areas from the PDS is decreasing, and households tend to buy the diverted kerosene oil more frequently from the open market.
In the case of LPG, because the release of consumer connection was controlled, the penetration of LPG in the rural areas was limited till 1999. The LPG distributors also had the geographical restrictions imposed, which did not allow them to expand the market. The poor infrastructure for distribution and storage in the rural areas also hinder the growth of the rural LPG market. Since 1999, the use of LPG as a fuel for cooking energy needs has increased. One reason is that availability has improved and time gap in getting connection is few days compared to several months or years till 1999. Another reason is the emergence of a middle-income class in the rural areas, which is able to purchase LPG. But the shift is still partial, and a combination of energy fuels - biomass and kerosene oil - are used by households having LPG. However, the demand of LPG by the low capacity end users remains low. The low demand is due to the availability of competing choices of biomass fuels at zero financial cost and the high cost involved in purchasing LPG.

3.2.1 Impact of reform on the rural petroleum fuel market

So have the reforms affected the rural petroleum market? The petroleum sector reforms have had a significant impact on access to petroleum fuels, but the impacts are different for kerosene oil and LPG. An aspect of the reform was introduction of the parallel marketing scheme involving private oil and gas companies for both fuels. While the rural areas have benefited from the private LPG companies, the same is not true for the kerosene oil market. Another implication has been due to the reduction of the subsidies on kerosene oil and LPG, which has affected negatively the rural poor.

Parallel marketing of kerosene oil and LPG: The availability of kerosene oil (white) under the parallel marketing mechanism is non-existent in the rural areas. The primary evidence from the villages show that kerosene oil available in the open market is the subsidised kerosene oil (blue), diverted from the public distribution system, and sold at higher prices of Rs 15-16 per litre (2001 and 2002 prices), compared to the PDS price of Rs 9-10.50 per litre.

In comparison to kerosene oil, the parallel marketing of LPG has benefited the rural areas, as the private sector has strategically targeted the rural markets. However, the
presence of the private sector companies varies across rural areas, an indication of demand for LPG. For example, in Kalahandi there is no private sector marketing of LPG, compared to Gosaba and Bastar, where they are active. On the other hand, the opening of the LPG market to private sector without any regulation has resulted in the entry of smaller gas companies into the market and these companies are not able to supply cylinders on a continuous basis.

**Phasing out of subsidies:** The empirical evidence from all the three case study areas show that households with a daily income or low income tend to buy kerosene oil more frequently (every two to three days in small monetary terms) from the open market, which is unsubsidised. In doing so, they pay about Rs 15-18 per litre instead of Rs 10.50 per litre, the price at which kerosene oil is available at the ration shop. From the ration shop they can buy the subsidised kerosene oil either once in a fortnight or month. Since these households have limited ability to purchase their kerosene oil quota in a single transaction, they end up buying from open market at higher price. The simple conclusion is that the subsidies on kerosene oil are not benefiting the poor.

**Upfront vs. refill cost of LPG:** The main barrier in adoption of LPG is not so much the upfront cost of getting a LPG connection (Rs 1500-3000)\(^1\), but the refill cost (Rs 275-280)\(^2\) of the cylinder. With the subsidies slowly being reduced, a refill cylinder is only going to become more expensive. The upfront cost can be spread out (by instalment), as some of the LPG distributors are doing for example in Gosaba and Bastar. These distributors do face the problem of LPG consumers defaulting, but the recovery rate is around 90%. The other approach, to address the upfront cost, was adopted under the *Deepam* scheme in Andhra Pradesh. In this scheme, the state government covered the initial cost and targeted the programme only at the Below Poverty Line (BPL) families (NIRD, 2002).

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\(^1\) The connection cost depends upon the type of connection – single or double cylinder, and cost of LPG stove

\(^2\) Although private companies market smaller capacity cylinders (11 kg or 12 Kg), the consumer price is same as that paid by a national oil company consumer.
The evidence from three case studies show that in nearly 75% of the households a cylinder is used for one-and-half or more months. The reason the cylinder lasts so long is that its use is limited to specific cooking purposes such as making tea or snacks or making food when urgently required. In addition, users are uncertain how long a cylinder would last, especially because refills are not immediately available, and there are additional costs, which can be significant in household cash flow terms for replacing the cylinder. As a result of the longer use of a LPG cylinder, the private LPG companies (unlike public sector gas companies) do not give double cylinder connection to the rural areas. Private gas companies do not want to tie-up cylinders in the rural areas, because there is a faster turnover of LPG in the urban areas.

Another barrier to adoption of LPG is the lack of delivery mechanism of cylinders to the rural areas by the dealers, irrespective of whether they are a national oil company or private dealer. Users have to organise collection themselves, which can add in the range of Rs 25-30 per cylinder as delivery charges (which is 10% of the cylinder cost). In Gosaba, users depend upon the boats ferrying goods for the market to bring cylinders from the main land where the dealer is located, and then hire a labour or carry themselves the cylinder to the household. In Kalahandi and Bastar households have to collect the cylinders on their own.

4.0 Discussion

The objective of the paper was to identify and raise the issues regarding the implication of the energy reforms in the context of the rural energy access. In the rural areas, the demand for modern energy carriers such as electricity and petroleum fuels are increasing. The willingness to pay for modern energy carriers is there but is linked to reliable and quality supply. However, the ability to pay remains low, especially among the majority of the un-served households who are poor. As a consequence, the current remittance from rural consumers is insufficient to provide private companies with sufficient funds to make further investments in improving access. Based on the fieldwork in three states we have identified five key issues in improving access. The first issue is the role of the government in creating access to modern energy services in the rural areas. The present state of the rural economy and rural infrastructure
necessitates that the energy policy for the rural areas has to be specifically defined in the overall energy policy. The assumption that market forces would develop the energy markets as it happened in some of the developed countries such as United Kingdom, is not applicable in case of India (Reddy, 2002). The presence of government is required not just in facilitating access by providing capital subsidy, but also as a regulator to formulate the appropriate policies and the guidelines. The experience of Orissa with electricity sector privatisation further supports the need for government’s intervention to continue. The second issue is the transition from traditional forms of energy to modern energy carriers, and will this be facilitated by the energy reforms. The transition towards modern forms of energy sources has remained slow and the rural energy demand especially that of low capacity end users remain biomass dependent. The evidence from the villages in our study shows that, in terms of fuel transition, the transition to electricity would be far more rapid when compared to LPG, which is considered more as a fuel for consumptive use rather than productive uses with which electricity is associated. The energy reforms in itself would not facilitate the shift and the role of the government and its investment would be required.

The third issue is that of modern energy for the consumptive and productive uses, because the proponent of energy reforms have emphasised that access to modern form would allow people to generate a surplus, participate in the market and therefore be able to afford the modern energy fuels (Barnett, 2000; de Lucia, 1998; World Bank, 2000). The access to modern forms of energy services is essential for the economic development of the rural areas and is not being disputed. However, for the vast majority of the low capacity end user, energy access means access to bare minimum energy needs to meet their needs for lighting and cooking. The use of modern energy for productive use and entertainment comes after meeting the basic household needs. Strongly linked to the argument of what would come first – consumptive or productive use, is the fourth issue of affordability for the kind of energy services people want. The low capacity end users cannot afford to pay high prices for modern energy fuels to meet their minimum energy needs. The resultant effect of the ongoing energy sector reforms is energy price rationalisation by phasing out subsidies and making the cost of energy fuels dearer. Therefore, the reforms, the way it is planned and implemented at present, would make it difficult for the low capacity end users to
afford modern energy fuels, even when it is available. As argued by the proponents, in the long run it may be possible to reduce the energy costs, but for the consumers it is the immediate payments and costs that matter. Improved access will not be realised without either a capital subsidy from state funds and/or the provision of cross-subsidy, which was in use even in the developed countries (Arentsen and Kunneke, 1996).

The **fifth issue** is that of the effectiveness of the energy sector reform policy in the context of India since it ignores the public benefits and social issues. The issue is that if the government intervention and subsidies are required to enhance access, and then is it worthwhile to continue with energy sector reform policy. The energy sector reform policy in the package as it exists today is focused on addressing the financial aspect and if pursued with will bring financial soundness as a result of overall efficiency improvements in the sector. The question is will it be able to address the social and public benefits such as the energy access in the rural areas, energy for health centres and educational institutions, etc, which are very crucial and essential for rural development in the developing countries such as India. In the present form of implementation, energy sector reforms are likely to continue to exclude the public benefits that are critical development of the rural areas (Reddy, 2002). It is not just the issue of economic development; social well-being and better quality of life are also the issues, which matter. The criticism is about the effectiveness of the reform policy to meet the objective, which where the rationale for initiating the reforms. For example, one of the argument was the government by withdrawing subsidies could channel its resources for social developmental programmes. However, the experience of electricity sector reforms in India does not provide any such evidence of enhanced government spending on social development sectors. In fact there is enhanced spending by the government under different schemes to improve electricity access and reduce distribution losses. There is a need for energy sector reform policy, but is it worthwhile to follow a process, which will not provide benefits, which are so essential for social and economic development of the rural population. The energy sector reforms policy will have to become pro-poor policy by incorporating the social and public benefits.

So far, the evidence from the study shows that the early phase of energy reforms has largely failed the low capacity end users, and its impact on access to energy in rural
areas may inevitably and irreparably lead to enhanced social inequality. The experience is mixed; in case of electricity, it has negatively affected access to electricity; whereas, in petroleum fuels, opening of markets has improved the availability. Availability is not the sufficient condition; ability to adapt and use it regularly is necessary. In order to improve energy access, need for subsidisation in some form will remain for a foreseeable future. Elements of reforms policies exclude the associated social and public benefits, which are critical for rural development and improving quality of life. The policies are already resulting in ‘cherry picking’ and ‘social dumping’ of the low capacity end users, and if appropriate measures are not adopted the inequality in access are inevitable. There is an urgent need to re-assess the energy sector reforms policy by making it a ‘pro-poor’ or ‘people-centered’ policy. This people-perception has largely been missing in the enunciation of reforms. By arguing for subsidies and incentives, and a people-centred approach, it needs to be stressed that these are not the social components of reforms, but the issues that need to be allowed to transform the very nature of the reforms. In any case, an institutional change brought about for limited purposes often influences other changes.

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References:


GoI (2003). 'Housing and Amenities, Census of India'. Table H-9 and Table H-11. New Delhi, Office of the Registrar General, Census of India.


