Chapter 8

Implications of Cash Transfers of Subsidies in the Energy Sector in India

Sangeeta V. Sharma

National Ecology and Environment Foundation (NEEF), India

August 2013

This chapter should be cited as

Sharma, S. V. (2013), 'Implications of Cash Transfers of Subsidies in the Energy Sector in India',. in Kimura, S., H. Phoumin and B. Jacobs (eds.), *Energy Market Integration in East Asia: Renewable Energy and its Deployment into the Power System*, ERIA Research Project Report 2012-26, Jakarta: ERIA. pp.267-290.

CHAPTER 8

Implications of Cash Transfers of Subsidies in the Energy Sector in India

SANGEETA V. SHARMA

National Ecology and Environment Foundation (NEEF), India

Recently, India has introduced a subsidy reform plan which involves a gradual removal of all subsidised items, including energy commodities, provided through public distribution systems (PDS). Broadly, the aim is to replace the PDS subsidies by direct cash transfers to the beneficiaries. However, there are several concerns associated with this reform plan, namely, the manner in which it is designed and implemented, and its impact on energy sector reforms.

This study is specifically focused on the plans, existing status and feasibility of direct cash transfer schemes (DCTS) for energy commodities such as PDS kerosene and liquefied petroleum gas. The study investigates the existing problems in the provision of energy subsidies through PDS; the impact of removal of these subsidies; effectiveness and sustainability of the cash transfers to the needy people; possibility of tackling leakages and corruption with DCTS which were associated with subsidisation through PDS; and the economic, environmental and social implications of cash transfers in India.

It is expected that the energy subsidy reforms may eventually lead to a gradual phasing out and ultimately a complete removal of energy subsidies. In such a case, the availability of energy commodities at market price across India could facilitate trading opportunities and contribute to energy market integration (EMI) within various states in the country and possibility with other countries in the East Asia Summit (EAS) region.

1. Introduction

The energy sector is one of the most important and heavily subsidised sectors in many countries across the globe. In petroleum-importing countries, the high cost of products such as diesel, petrol, kerosene and liquefied petroleum gas (LPG) need to be subsidised so as to make them affordable to masses. The factors that determine the provision of subsidies are their total cost, fiscal burden on the economy, the social benefits and impact on the welfare of the beneficiaries. The International Energy Agency (IEA) defines energy subsidy as any government action that lowers the cost of energy production, raises the price paid to energy producers or lowers the price paid by energy consumers. Many countries across the world subsidise fossil fuels in order to provide financial support for the users and compensate for steep increases in international energy prices. The IEA estimates that fossil-fuel subsidies worldwide amounted to $523 billion for the year 2011. However, these subsidies prove to be very costly in economic terms, creating a huge burden on government budgets and distorting national and international markets.

In India, energy subsidies aimed at protecting consumers are provided for electricity and four major petroleum products: petrol, diesel, kerosene and LPG. Petrol subsidies have been removed and those on diesel are being gradually phased out. Energy commodities such as kerosene and LPG are still subsidised to reduce the cost of energy, particularly for economically weaker households. Subsidies impose tremendous pressure on the government's fiscal budget and yet their benefits often fail to reach the targeted population. For example, while the government of India (GoI) provides huge LPG subsidies, the majority of Indians who use LPG as a cooking fuel live in urban areas and are economically well-off. On the other hand, most of India's roughly 1.2 billion people who are below the poverty line (BPL) dwell in rural areas and continue to use traditional fuels such as coal, wood or dung for cooking and heating. Also, both subsidised kerosene and LPG, which were available to the poor through the public distribution system (PDS) earlier, was wrongly diverted for commercial usage.

Recently, the government of India (GoI) has initiated energy subsidy reforms to stop leakages and corruption in the PDS and benefit the targeted population.

Consequently, subsidies on LPG and kerosene are being replaced by direct cash transfers (DCTs), also termed as direct beneficiary transfers (DBTs). Under this Direct Cash Transfer Scheme (DCTS), money is directly deposited in the beneficiaries' bank accounts to enable them to buy energy commodities at the market price. These DCTs are not conditional, therefore there is a possibility that the subsidy amount maybe misspent by the beneficiaries on items other than LPG and kerosene.

The objective of this study is to review the state of provision of energy subsidies (kerosene and LPG) through DCTs in India and their economic, environmental and social implications. Based on some examples of good practices, the study endeavours to seek country-specific solutions to associated problems and suggest appropriate remedial measures.

The main research questions addressed in the study are as follows:

- What are the existing problems associated with the provision of subsidies in the energy sector and what would be the impact of removing these subsidies?
- Would the cash transfers (CTs) to the needy people be effective and sustainable?
- Would the CT mechanism tackle the problems such as leakages and possible corruption which were associated with traditional forms of subsidisation (PDS)?
- What would be the economic, environmental and social implications of CTs in India?
-

It is expected that the energy subsidy reform may eventually lead to a gradual phase-out and, ultimately, a complete removal of energy subsidies. Such a scenario, when energy commodities are available at market price across India, could facilitate trading opportunities and contribute to energy market integration (EMI) with other countries in the East Asia Summit (EAS) region.

2. Overview of Energy Subsidies

The main reasons for providing the energy subsidies to consumers are increasing access to energy for those who cannot afford it at market price; reducing pollution to

fulfil international obligations; and Employment and social benefits (EEA, 2004). However, energy subsidies often have several adverse effects, such as higher levels of consumption and wasteful use of valuable resources; possibility of diversion of subsidised commodities into the black market; weakening the prospects of economic growth; and not reaching the targeted people who need them most (UNEP, 2002; Pershing and Mackenzie, 2004).

In 1997 the World Bank estimated the amount of annual fossil-fuel subsidies at $10 billion in the OECD and $48 billion in twenty of the largest non-OECD countries. By 2007, these subsidies had increased to $310 billion per year in the same twenty non-OECD countries (WEO, 2008). It is estimated that more than 90 per cent of the direct subsidies from European governments during the period from 1990 to 1995 went to fossil fuels and nuclear power, while only 9 per cent of it was directed towards other forms of renewable energy. The majority of these subsidies were consumption subsidies meant for end-users (Morgan, 2007). The IEA estimated that fossil fuel subsidies provided to consumers in 37 countries, representing 95 per cent of global subsidised fossil fuel consumption, reached $557 billion in 2008. It was found that subsidies provided to producers of fossil fuels were around $100 billion per year. The total volume of subsidies to producers and consumers, almost $700 billion a year, was roughly equivalent to one per cent of the world GDP (WB, 2009; OECD, 2008).

Many types of subsidies, especially those that encourage the production and use of fossil fuels and other non-renewable forms of energy, can have high economic and social costs. In developing countries they also compete for limited resources; widen the scope for rent seeking and commercial malpractice; discourage both supply-side and demand-side efficiency improvement; promote wasteful consumption of energy; can make new forms of renewable energy uncompetitive; and, can be detrimental to the environment.

Reforming the environmentally harmful energy subsidies plays an important role in the global objective of moving towards a more sustainable development path. Some countries are already reassessing their subsidy policies in terms of their environmental, social and economic impacts. Globally, all countries need to make much more concerted efforts to reduce the subsidies that promote the use of fossil fuels.

Reforms in subsidies such as their restructuring, reduction and removal may prove to be helpful for the economy as well as the environment. It has been demonstrated that subsidy reforms have the potential to provide significant gains in economic efficiency and reductions in CO_2 emissions (Anderson and McKibbin, 1997). For energy-producing countries, the removal of energy subsidies would increase energy prices immediately, which would result in a fall in energy consumption and rise in energy exports (Saunders and Schneider, 2000). It is estimated that, if consumer subsidies for fossil fuels and electricity in 20 non-OECD countries were phased out gradually, by 2050 world CO_2 emissions would be reduced by 13 per cent and Greenhouse Gas (GHG) emissions would be reduced by 10 per cent (Burniaux, *et al*., 2009).

According to an estimate by IEA, fossil-fuel subsidies worldwide amounted to $523 billion for the year 2011, up from $412 billion in 2010, with subsidies to oil products representing over half of the total (WEO, 2012). Variations in international fuel prices are chiefly responsible for differences in year-to-year subsidy costs. The increase in the total global amount of subsidies in 2011 closely tracked the sharp rise in international fuel prices. The total global amount of fossil fuel subsidies provided in 2012 was around $775 billion. Among developed nations, Australia paid $8.4 billion in subsidies while Germany and the UK paid $6.6 billion each. Japan provided $5 billion (OCI, 2012).

3. Energy Subsidies in India

Energy prices are heavily subsidised in India with the objective of protecting the consumers from international price fluctuations and allowing energy access to them on a sustainable basis. International oil prices are very important in the domestic pricing of sensitive petroleum products in India as the country imports about 80% of its crude oil requirement. In India, crude prices have been steadily increasing since 2008, largely due to the global economic recovery and increasing demand from emerging economies. Major share of subsidies in India, for food, fertiliser and petroleum, has increased significantly over the years, from 1.39 per cent of GDP in 2000-01 to around 2.3 per cent of GDP in the year 2011-12 and 1.78 per cent of GDP in the year 2012-13

(ET, 2013). In the Union Budget 2012-13, the target was to keep all subsidies (energy and non-energy) under 2 per cent of GDP and under 1.75 per cent of GDP in the next 3 years. According to GoI estimates, if the traditional PDS is replaced by the DCTS, it could potentially reduce the under-recoveries on kerosene by INR.75 billion and on LPG by INR 72 billion (IIFL, 2013). In the recent Budget, presented in February, 2013, major subsidies bill has been estimated at INR 2.48 trillion. Petroleum subsidy for 2013-14 is seen at INR. 650 billion while that for 2012-13 has been revised to INR. 968.8 billion (TOI, 2013).

In India, the sale price of subsidised kerosene and domestic LPG is lower than international market prices. Although the GoI provided a fiscal subsidy on LPG and kerosene, it covers only a part of the difference between the cost price (including marketing costs) and the selling price of these three petroleum products, thereby resulting in "under-recoveries" for government-owned oil marketing companies (OMCs) such as Indian Oil Corporation Limited (IOCL), Bharat Petroleum Corporation Limited (BPCL) and Hindustan Petroleum Corporation Limited (HPCL). The under-recoveries are calculated as the difference between the cost price and the regulated price at which petroleum products are finally sold by the OMCs to the retailers, after accounting for the subsidy paid by the government.

Along with the steady increase in international oil prices, the OMCs' under-recoveries have also been rising proportionately. The details of the under-recoveries incurred by OMCs on the sale of sensitive petroleum products from the year 2005-06 to 2012-13 are given in Table 1. Figure 1 summarises the under-recoveries and fiscal subsidies for the past five years. It can be seen in Table1 that the fiscal subsidy has increased only marginally, while the under-recoveries have almost doubled between 2009–2010 and 2010-11.

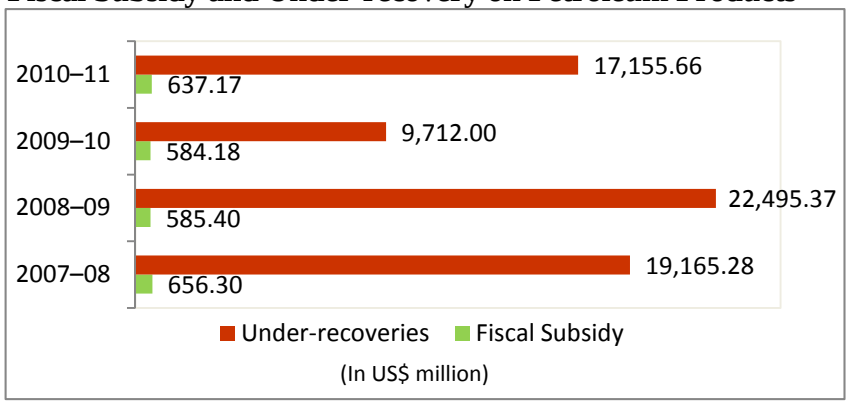
Table 1: Under-recovery to OMCs on Sale of Petroleum Products (in crore, INR)

Sensitive Petroleum Products	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Petrol *	2,723	2,027	7,332	5,181	5,151	2,227	-	-
Diesel	12,647	18,776	35,166	52,286	9,279	34,706	81,192	92,061
Domestic LPG**	10,246	10,701	15,523	17,600	1,457	21,772	29,997	39,558
PDS Kerosene	14,384	17,883	19,102	28,225	1,764	19,484	27,352	29,410
Total	**40,000**	**49,387**	**77,123**	**103,292**	**46,051**	**78,190**	**138,541**	**161,029**

Source: PPAC, (2013a)

Note: * Under-recovery on petrol is only up to 25th June 2010 after which it has been deregulated.
** Effective 18.01.2013, the GoI will sell Diesel to all consumers taking bulk supplies directly from the installations of OMCs at the non-subsidised market-determined price.
***Effective 18.01.2013, the GoI will provide 9 subsidised LPG cylinders to each consumer annually.

Figure 1: Fiscal Subsidy and Under-recovery on Petroleum Products



Source: PPAC, (2013b).

Until 2010, the Indian government controlled the prices of petrol, diesel, kerosene and LPG. In June 2010, the Indian government deregulated the price of petrol and in 2013 also announced a gradual phasing out of subsidies on diesel. In its budget for 2011-12, the Indian government proposed substitution of subsidies for specific budget items, namely kerosene, LPG and fertilisers, by CTs. There are several factors responsible for this decision, such as India's growing fiscal deficit; distortions resulting from the existing subsidy policies/schemes; lessons learned from other countries exemplifying the success of cash transfers as a means of reducing poverty levels and improving the social welfare of lower-income households; and ambitious projects like the "Aadhaar" biomarker-based Unique Identity (UID) program wherein each citizen

is provided a unique identity number using their biometric information and "Swa-bhiman" under which every Indian will have access to a bank account.

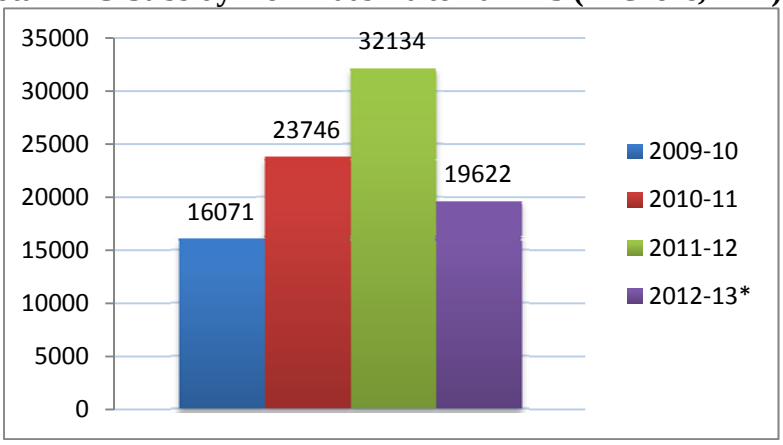
Liquefied petroleum gas (LPG)

LPG is supplied to the consumers through distribution networks of the OMCs, mainly in urban areas and some rural areas. An estimated 76 percent of LPG subsidy is allocated to urban areas, which contain only one quarter of the Indian population. Of this urban subsidy, over half is enjoyed by approximately one quarter of households. This means that almost 40 percent of the LPG subsidy benefits a mere 7 percent of the population. Moreover, the subsidy represents less than 5 percent of expenditure for this segment of the population. This is a far lower share than what Indians living BPL spend on kerosene (UNEP, 2008).

In terms of consumption, LPG for household use accounts for nearly 89% of the total off-take in India. Total LPG consumption for the year 2011-12 was more than 16.5 MT (Million Tons) and it is expected to grow at 8-9% according to official estimates provided by the Ministry of Petroleum and Natural Gas. LPG for domestic cooking is heavily subsidised and thus, to restrict any diversion, every household is permitted to have only one registered LPG connection. LPG subsidies mainly benefit higher-income households that generally give preference to LPG for cooking and water heating. The state-owned LPG wholesale suppliers have been forced to ration the supply of subsidised LPG to limit their financial losses given rising demand and international prices.

Figure 2 shows the total subsidy provided to LPG consumers between years 2009-10 and 2012-13, which increased from INR 160.71 billion in 2009-10 to INR 321.34 billion in 2011-12. The provisional figure for April to September 2013 is INR 196.22 billion, which is more than half of last year's subsidy value. In 'per unit' terms, LPG subsidy increased from INR 200.71 per cylinder in 2009-10 to INR 342.88 per cylinder in 2011-12 and INR 405.67 per cylinder for the first half (April to September) of 2012-13.

Figure 2: Total LPG Subsidy from 2009-10 to 2012-13 (in Crore, INR)



Note: *: Provisional Figures for the first half (Apr. to Sept.) of 2012-2013.
Source: PIB, (2013)

Kerosene

Since 2002-03 the kerosene subsidy has increased more or less uniformly from INR 4.14 per litre in 2002-03 to INR 27.26 per litre in 2011-12. According to a conservation estimate by the Union Oil Ministry, in 2012 as much as 40 per cent of the kerosene supplied was siphoned off and sold on the black market. It is then used as furnace oil in industries and even used for adulteration of diesel and lubricants. In India, it's the affluent who generally consume larger quantities of petroleum products and electricity. Thus, the energy subsidies benefit higher-income households rather than the economically weaker sections of society, thereby defeating the very purpose of the subsidies (IHT, 2005; TOI, 2012). Table 3 gives the details of the total subsidy on PDS Kerosene and Domestic LPG to customers over the last decade.

Table 3: Total Subsidy on PDS Kerosene and Domestic LPG to Consumers (in INR)

Year	PDS Kerosene per litre			Domestic LPG per cylinder		
	From Government Budget	By Public Sector Oil Companies	**Total Subsidy**	From Government Budget	By Public Sector Oil Companies	**Total Subsidy**
2002-03	2.45	1.69	**4.14**	67.75	62.27	**130.02**
2003-04	1.65	3.12	**4.77**	45.18	89.54	**134.72**
2004-05	0.82	7.96	**8.78**	22.58	124.89	**147.47**
2005-06	0.82	12.10	**12.92**	22.58	152.46	**175.04**

2006-07	0.82	15.17	**15.99**	22.58	156.08	**178.66**
2007-08	0.82	16.23	**17.05**	22.58	214.05	**236.63**
2008-09	0.82	24.06	**24.88**	22.58	234.88	**257.46**
2009-10	0.82	14.85	**15.67**	22.58	178.13	**200.71**
2010-11	0.82	17.39	**18.21**	22.58	249.94	**272.52**
2011-12	0.82	26.44	**27.26**	22.58	320.30	**342.88**
2012-13	0.82	31.16	**22.58**	22.58	427.14	**449.72**

Source: PPAC, (2013a).

India has made a commitment to the Group of 20 (G-20) to phase out inefficient energy subsidies that encourage wasteful consumption and are a fiscal burden on the government budget and also the OMCs which price retail petroleum products below their cost. This is also likely to provide the framework for a discussion within the national government on rationalizing petroleum subsidies. This in turn will help link the domestic retail prices of petroleum products to international crude prices. Such a parallel relationship will reduce the subsidies and thereby ease the burden on the OMCs.

In January 2013 the GoI decided to restrict the number of subsidised LPG cylinders to nine per household per year. A government committee also took the decision to partially deregulate the diesel prices and empowered OMCs to increase diesel prices gradually (INR 0.5 per month). However, the price of public distribution system (PDS) kerosene is still regulated and, if continued, may create problems with possible substitution or adulteration of diesel by subsidised kerosene.

4. Subsidy on Renewable Energy

India is working on increasing the share of renewable energy (RE) in its total energy mix and, in order to enhance the use of clean energy, the GoI provide subsidies and some regulatory incentives to attract investors. Recently, in April 2013, the GoI announced its plans for green growth at the fourth Clean Energy Ministerial (CEM4). India's 12th Five Year Plan is believed to be a key strategy for sustainable growth. A national target has been set towards increasing the efficiency of energy use to bring

about a 20 to 25% reduction in the energy intensity of the country's GDP by 2020. Plans to achieve this target would include exploiting solar, wind and biomass energies. The GoI has also announced a target of doubling the RE capacity from 25,000 megawatts in 2012 to 55,000 megawatts by the year 2017. The GoI launched the Jawaharlal Nehru National (JNN) Solar Mission in January 2010, with an ambitious target of deploying 20,000 MW of grid-connected solar power by 2022. The Government strongly encourages global manufacturers to set up production facilities in the country.

In 2010, the Ministry of New and Renewable Energy (MNRE) in India introduced a subsidy-linked credit scheme for solar off-grid (photo-voltaic and thermal) and decentralised applications to promote commercial marketing of solar energy systems and devices by extending financial incentives in the form of capital and interest subsidy on loans availed from financial institutions by the target clientele. The National Bank for Agriculture and Rural Development (NABARD) is the authorised route for transferring these subsidies on bank loans (MNRE, 2013b).

With an installed capacity of 19 GW of wind energy as of March 2013, renewable energy sources (excluding small Hydro) currently account for 12.5% (i.e. 27.5 GW) of India's overall installed power capacity. Wind energy holds the major portion of 70% among renewable sources and continued as the largest supplier of clean energy. In its 12th Five Year Plan (2012-2017), the GoI has set a target of adding 18.5 GW of renewable energy sources to the generation mix, out of which 11 GW is estimated for wind energy; 4 GW for solar energy and 3.5 GW for others (MoP, 2013).

The GoI reintroduced a subsidy for wind farms and announced low-interest loans for clean energy generators in its budget for 2013-14. The government will allocate INR 8 billion ($147 million) to the renewable energy ministry for the subsidy. Annual installations in India, the world's third biggest wind market, more than doubled from 2009 to 2011 helped by the subsidy. The withdrawal of the incentive in March 2012 contributed to a 50 per cent drop in capacity additions this fiscal year. Reinstatement of the generation-based incentive is expected to add at least 400 megawatts of wind capacity in India within a year. The GoI will also provide companies that generate renewable energy with low-interest loans for the next five years from the National Clean Energy Fund (Bloomberg, 2013).

Currently, in addition to the Central Financial Assistance, fiscal incentives such as 80% accelerated depreciation, concessional import duty, excise duty, and 10-year tax holidays are available for biomass power projects. The benefit of concessional custom duty and excise duty exemption are available on equipments required for initial setting up of biomass projects based on certification by the Ministry. State Electricity Regulatory Commissions have determined preferential tariffs and Renewable Purchase Standards (RPS). The Indian Renewable Energy Development Agency (IREDA) provides loans for setting up biomass power and bagasse cogeneration projects (MNRE, 2013a).

5. Subsidies through Direct Cash Transfers

The recent expansion of cash transfer programs throughout emerging and low-income economies, with eligibility for benefits linked to certain criteria, has greatly increased the capacity of these economies to protect poor households from price and other shocks while simultaneously addressing the root causes of persistent poverty. (Fiszbein and Schady, 2009; Garcia and Moore, 2012). Many countries have implemented DCTS as an energy subsidy reform measure. The best examples are the Latin American countries, such as Mexico, Nicaragua, Brazil, Honduras, Jamaica, and Chile (Nigenda and González-Robledo, 2005). In addition to addressing the problems of leakages and poverty, the CTs could also contribute directly or indirectly to a greater range of development outcomes. The additional income from the CTs could help households develop human capital, own productive assets and gain access to credit on better terms.

In *Indonesia* the government has allocated 274.7 trillion Rupiah (about 29 billion US dollars) for energy subsidies in 2013, which is equivalent to 18 per cent of the budgeted spending. The energy subsidy reached 306 trillion Rupiah in 2012, more than the 202 trillion Rupiah allocated in the revised state budget (XN, 2012). Indonesia's unconditional cash transfer program, which covered 35 per cent of the population, was an important component of its successful strategy in overcoming social and political opposition to fuel subsidy reforms. *Armenia* successfully

introduced a targeted cash transfer program during its electricity reform and was able to gradually reduce the coverage of households from 25 per cent in 1999 to 18 per cent in 2010.

Iran is one of the largest gasoline consumers in the world and was the largest provider of fuel subsidy until 2009. A fuel subsidy reform plan was introduced in 2010 after careful planning based on an extensive public relations campaign which stressed the importance of replacing energy subsidies with CTs to reduce wasteful energy consumption and leakages. The subsidy amount was deposited in the bank accounts (opened well in advance, prior to the introduction the scheme) of the intended beneficiaries before the price hike of the energy product (IMF, 2013). According to their government estimates, almost $100 billion is spent on energy subsidies per year, of which $45 billion is on subsidising fuel prices alone. It is believed that implementation of the targeted subsidy system will eradicate unemployment and poverty in Iran within three years (Wikipedia, 2013).

In *India*, the PDS for energy subsidies have not been successful mainly because the subsidies have not reached the targeted beneficiaries. In fact, the benefits received by the non-poor households have been far greater than those for the poor. Under the current circumstances of increasing fiscal deficits the country has implemented the DCTS. However, the scheme (discussed in the next section) is still in its initial stage and due to several operational deficiencies the benefits of such a transition from in-kind to cash transfers are yet to be seen.

6. DCTS in India

The Direct Cash Transfer Scheme (DCTS) for provision of energy subsidies has been recently introduced in India (in 2013) and it is expected to reduce leakages that were inherent in the PDS. DCTS is preferred due to several other reasons, such as lower operational costs; greater purchasing power; larger consumption choice-set for the beneficiaries; progressive impact of the program on income distribution of the poor; and, less scope for corruption. The role of DCTS in the Indian context is summarised in Table 4.

Table 4: The role of DCTS in the Indian context

Role	Focus*	Objective
Protection	vulnerable (poor and near-poor); chronic poor; transitory poor	Alleviate chronic poverty by improving the living standards to an acceptable level; prevent market price fluctuations from causing irreversible damage to the productive capacities and human capital of vulnerable section.
Promotion	economically active poor; near-poor	Improve capabilities and provide opportunities to the poor and vulnerable households; enable households to avoid low-risk, low productivity traps.
Empowerment	socially marginal or excluded groups; women and girl-child	Empowerment of women, Dalits and other marginalised ethnic groups and provide economic opportunities and access to public services.

Source: DFID, 2011.

Definitions:

i) *Poor*: Identified as those whose incomes or financial resources fall below the poverty line (According to India's Planning Commission Report, 2012, the Poverty Line in India is defined at INR 672.8 in rural area and INR 859.6 in urban areas).

ii) *Chronic poor:* An individual whose permanent income is insufficient to meet basic needs.

iii) *Economically active poor:* Those who fall under the definition of poor but have the capacity to repay back loans.

iv) *Near Poor:* Identified as those whose incomes or financial resources exceed the current definition of poverty but who have very limited economic resources.

v) *Transitory poor:* An individual whose permanent income exceeds a given minimum standard but annual income falls below that standard in some years.

7. Pilot studies on DCTS

In December 2011 a pilot DCTS project was initiated in Kotkasim, a village in Alwar, Rajasthan that has over 25,000 households. It was intended primarily to replace the state subsidy of INR 14 per litre on kerosene. Under this project, in all fair price shops kerosene was sold at Rs 44.50 per litre, which was the open market price set by oil companies in this region. For this project, the central government gave the subsidy amount to the district administration, which then transferred it to eligible

ration card holders. Preliminary results indicated that the scheme was not successful for several reasons. The main problem was the inefficiency in the implementation process. Although the ration shops were stocked up with months of kerosene supply, the villagers could not buy it either due to delay in transfers or due to the fact that the villagers who did receive the cash were not regular buyers and were using it for other purposes. With the withdrawal of the subsidy, prices increased while the cash transfer was delayed or did not take place at all. The government did not have in place an efficient system to replace subsidy by cash delivery. Based on the lessons learnt from this pilot project the GoI decided to use Aadhaar-linked direct cash transfers to the beneficiaries.

With effect from January 1 2013, the GoI has introduced DCTS at an all-India level, which is based on a UID number called "Aadhaar." The two main eligibility criteria for the scheme are bank/post office accounts and a UID number. Under this scheme, beneficiaries in 20 districts across the country will receive the subsidy amount in cash into their bank accounts/post office accounts and use that to purchase kerosene from the Fair Price Shops at the regular market price. The purpose of these cash transfers is to ensure that benefits go to individuals' bank accounts electronically, minimizing the number of tiers involved in fund-flow thereby reducing delays in payment, ensuring accurate targeting of the beneficiary and curbing pilferage and duplication.

The DCTS scheme covers a total of 121 districts and is divided into Phase I (43 districts) and Phase II (78 districts). The second phase of DBT (including the LPG subsidy) was introduced from 1 June 2013 to cover 20 districts, and then will be extended nation-wide along with the expansion of Aadhaar enrolment. In this phase, 78 more districts are to be covered in addition to the 43 districts already under DCTS in Phase I. Conceptually, DCTS involves four simple steps, which are: 1) digitizing data; (2) enrolling in Aadhaar numbers; (3) opening bank accounts; and (4) linking these accounts. Practically, one needs to resolve the operational issues related to the manner in which these steps are taken.

8. Shortcomings in DCTS

Despite its efforts, the GoI has failed to fast-track the DCTS. This scheme was to be introduced in all 655 Indian districts by mid-2013. However, this is far from the real situation as the scheme is now suffering from drawbacks and is facing several complexities due to unsatisfactory tracking and monitoring systems in various departments. Some limitations of this scheme are given below:

Inefficiencies in UID system: In the DCTS, the subsidy amount is directly deposited into the bank account of the beneficiaries, which are linked to their UID numbers. Presently, only about 21 crore of the 120 crore people of India have these cards. This is less than a third of the number of people targeted under this scheme. This implies that the current UID registration and distribution system is quite inefficient and incapable of developing a robust structure to identify the targeted beneficiary.

Inadequate Banking Infrastructure: Another drawback is that only 40 percent of India's population has bank accounts; most BPL families don't have bank accounts and several villages don't have any bank at all. Also, the current banking infrastructure does not have the capacity to handle more accounts on a larger scale. Moreover, the banks have been unenthusiastic to come to rural areas as these are merely utilitarian accounts that are not profitable for banks.

Inaccurate Identification: In India, a major problem is definition of poverty line and identification of BPL families based on this definition. The National Sampling Survey (NSS) data show that about 50% of poor rural households do not have a BPL card. These families are deprived of the subsidy benefits and such incorrect identification of the BPL families could hamper the DCTS.

No Safeguard against Inflation: In the DCTS, the amount of cash transferred to each beneficiary is fixed and does not vary with the market prices. Hence it will offer no protection for poor families against inflation in kerosene and LPG prices. This is a critical point in the present scenario of high inflation rates.

Leakages and Possible Corruption: One of the main benefits of introducing the DCTS is reduction in leakages and corruption. However, since a proper monitoring mechanism is still not in place, it will encourage the retailers to continue to indulge in

malpractices by diverting the quota provided by the government for the beneficiaries to the black market. The poor, who are the targeted beneficiaries, are often unaware of their rightful quota and days of availability of the energy item (e.g. kerosene) in the fair price shops. Although the official price of kerosene in the fair price shops is around INR 14-15 per litre, the black market price is between INR 70- 80 per litre (ET, 2013). Such a false projection of acute shortage and high black market price is a deterrent and compels the poor to opt for cheaper cooking fuels instead of kerosene.

Diversion of Energy Cash Subsidies: The BPL families are so poor that they may prefer not to buy energy commodities from the open market. Instead, these families may use the cash transfers to buy food and other basic items. For meeting their energy needs, they may use traditional (polluting) fuels, which will have a negative impact on the health of the household and the environment.

9. Impact of DCTS

Introduction of DCTS in India may have several economic, environmental and social impacts, some of which are outlined as follows.

Various forms of subsidies, including energy subsidies, account for a significant part of the Indian government's expenditure. According to the GoI estimates, the DCTS could reduce gross under-recoveries on kerosene by INR75 billion and on LPG byINR72 billion (IIFL, 2013). However, an important consideration is that when money is directly deposited on a monthly basis into the bank accounts of the beneficiaries, a higher number of people could avail this benefit. Unlike the PDS system where all the beneficiaries may not avail the in-kind subsidy, in the DCTS the number of people availing the cash-subsidy could be higher. This may increase the fiscal burden and government expenditure. On the other hand, diversion of subsidised items, provided through PDS, into the black market could be curtailed in DCTS, thus reducing the economic burden on the government.

The environmental impacts of the DCTS could be positive as well as negative. While providing energy commodities at a subsidised price through PDS encourages the consumer to use clean forms of energy, cash transfers, if not conditional, may not

be as effective. Under normal cash transfers, a consumer may not buy the kerosene or LPG, preferring to use traditional fuels which cause both ambient and indoor air pollution. This may have detrimental effect on the health of household members and society as a whole. On the other hand, if subsidies are removed, free market and higher price may reduce overall consumption of energy commodities, resulting in less ambient air pollution and associated health hazards. Thus, from an environmental point of view, it is necessary to estimate the net effect of both schemes.

In developing countries like India, in order to estimate the social benefits of DCTS of energy items one needs to understand two main effects, namely a) the impact of changes in energy prices on the targeted beneficiaries, and b) the effect on people's access to, and use of, different types of energy and resulting impact on their health and well-being. For example, reducing subsidies on commercial fuels (kerosene and LPG) makes them expensive and poorer households are thereby forced to resort to non-commercial fuels, such as wood, which in turn may be responsible for deforestation and environmental pollution. These impacts, especially those related to health, are clearly important and have major social implications, especially in developing countries. Therefore, any plan to remove or reduce energy subsidies must include actions that compensate the negative social consequences.

10. Conclusions

This study reviews and analyses the provision of subsidies and assesses the implications of energy subsidy cash transfers in India. Provision of subsidies and their objectives are country-specific, for example developing nations like India provide subsidies to reduce poverty and improve people's standards. However, the benefits can be maximised only when the subsidies are transparent, well targeted, and effectively implemented without any leakages. Any subsidy program must ensure that its benefits reach the poorest section of the population and avoid errors of inclusion or exclusion. In general, the GoI provides major subsidies in the household, agriculture, industry and transportation sectors. For the last couple of years, the total subsidy

provided by the government has been between 2 and 3 per cent of GDP, and the target is to contain this amount at less than 1.75 per cent of GDP in the next three years.

Energy subsidies in India are means of ensuring affordable energy commodities and services for lower income households, and protecting them from international price volatility. However, continuation of these subsidies may not be possible due to the limited domestic production of oil and gas, the rising cost of energy supply, and the government's burgeoning fiscal deficit.

Energy subsidies generally benefit the affluent, and often do not reach the poor who should be the real targeted beneficiaries. Also, the subsidies provided through PDS may not reach the targeted beneficiary as subsidised fuel items are illegally diverted to the open market and often lead to inefficiency and other related problems.

To reduce the problems associated with market distortion, leakages and corruption the GoI introduced a subsidy reform plan in January 2013, wherein subsidies will be provided in cash to the beneficiaries. The plan is known as DCTS and aims to link a unique identification number (UID), called "Aadhaar," to the bank account of the beneficiary. This scheme is expected to lower operational costs, create greater purchasing power, provide a larger consumption choice-set for the beneficiaries, and have a progressive impact distribution of income to the poor. The CTs may prove to be more efficient as they save time and reduce the cost of transport, storage and distribution of the subsidised energy goods required in the PDS.

Cash transfers for LPG and kerosene have been included under the DCTS scheme from June 2013. The Public Sector OMCs have launched LPG transparency portals to improve customer service and reduce leakages. Thus, the GoI has made an earnest effort to address issues such as leakages, possible corruption and fraud. There is a plan to extend the DCTS to the whole country within a year and complete the linking of beneficiaries' bank accounts with their UID number. However, given the existing condition of banking and UID enrolment infrastructure, this may prove to be very difficult task.

It is not clear if the CTs for LPG and kerosene, provided through DCTS, will be conditional or not. If they are not conditional, it may have several negative socio-economic and environmental effects as the additional income support may not be used for energy items. For example, instead of buying clean fuels for cooking, the

consumers may spend the subsidy money on food items or on consumption of tobacco or alcohol, and switch over to using traditional fuels. Both of these activities would adversely affect the health of consumers and the environment. Initially, the DCTS may look attractive to consumers but, if not linked to inflation, they may not be sustainable as the purchasing power of the beneficiaries will be reduced in the long run. This is of particularly concern given the often-changing political scene in India in which new governments often change the social welfare schemes of the previous government.

An important prerequisite for success of DCTS is the accurate identification of beneficiaries and a reliable institutional structure to monitor the progress of DCTS and simultaneously rectify problems as soon as they are detected. However, at present this is not being addressed in these schemes.

Energy subsidy reform in India could be an important step for EMI in the EAS region. When energy items are provided at market price, it encourages price parity and trading among countries. In order to promote foreign investment and a competitive energy market, it is essential to work towards the removal of import barriers and cross-subsidies in energy price. Further, transparent dealings, robust infrastructure, efficient procedures and, most importantly, political goodwill among trading partners will go a long way towards promoting EMI in East Asia.

11. Recommendations

The DCTS for provision of subsidies, recently introduced in India, are aimed at being effective and reduce the burden of the Government's saving compared to the subsidies through PDS. However, as of now only a few districts are covered and the success of the scheme can be seen only after it is implemented in many districts. Given various problems with the earlier PDS, any reform in subsidy provision, such as that through DCTS, should address issues related to efficiency, equity and fiscal impacts. Current reforms in subsidies may pose a challenge on socio-economic, political, and environmental fronts. To ensure a positive impact of DCTS, some recommendations are as follows:

- Energy subsidy reforms should be based on two basic norms, namely, proper identification of beneficiaries and delivery of subsidies to them, as well as their implementation, should be reviewed periodically. This necessitates a speedy issuance of "Aadhaar" numbers to intended beneficiaries, facilitating the opening of their bank accounts, and linking Aadhaar to these bank accounts.
- DCTS will have some 'transaction costs' and it is important to take into account all such costs while reviewing these schemes. These costs could be analysed in terms of the main sources of these costs, and the extent to which these are borne by the government, OMCs and the consumers. Based on the lessons learned from the experience of earlier implementation, some complementary policy instruments and remedial measures can be introduced to minimise transaction costs in future implementations.
- Operational and transactional costs could be reduced substantially if the cash transfers are made through mobile phone accounts. Mobile phones have much higher subscription levels than bank accounts, particularly in rural areas of India. Thus, linking "Aadhaar" numbers to mobile phone accounts could be faster and less expensive than widening the usage of bank accounts.
- It is necessary to estimate total fiscal burden on public authorities subsequent to implementation of the DCTS, which includes the cost of the UID procedures, linking of bank accounts to the UID of beneficiaries and expenses incurred in upgrading the infrastructure to handle the DCTS on a large scale.
- DBTS should be economically efficient and result in maximum net social benefits, i.e. the difference between total social benefits and economic costs should be maximum. Thus, the total costs incurred by the DCTS scheme during the initial phase could be estimated and weighed against the benefits of energy cost savings and increased energy efficiency. All stakeholders need to focus more on fulfilment of the objectives of the DCTS, such as benefiting the poor, and social and environmental welfare rather than the economic expenditure. For achieving maximum socio-economic and environmental benefits and being effective in helping the poor, the DCTS for energy commodities should be "conditional" so that the cash transferred to the beneficiaries is specifically used for buying only energy commodities such as LPG and kerosene. Conditional energy subsidy cash transfers will not only provide additional income support to the poor but will also modify household behaviour (i.e. they use the cash to buy clean fuel only), thereby achieving the larger social and environmental objectives.
- The Government could establish a special purpose working group which collects feedback from, and disseminates information to, the public about the benefits of the DCTS. It could establish a network of people from the media, civil society, local communities, government representatives etc., to educate the masses and also reform the scheme based on any shortcomings, if detected.

Thus, the advantages of the DCTS can be promoted while the problems can be reduced or eliminated in the long run.

- The DCTS must ensure that the subsidy amount is transferred on time as delays in release of these funds to the beneficiaries' bank accounts will defeat the very purpose of the cash transfers. Also, the amount of subsidy money should not be fixed as there must be some provision for adjusting this amount in line with the market price of the energy product.

References

Anderson, K., and W. J. McKibbin (1997), 'Reducing Coal Subsidies and Trade Barriers: Their Contribution to Greenhouse Gas Abatement', *Seminar Paper* 97-07, University of Adelaide, Centre for International Economic Studies (CIES), July, 1997.

Bloomberg (2013), 'India Budget Revives Wind Subsidy Introduces Low Cost Loans', Available at: http://www.bloomberg.com/news/2013-02-28/india-budget-revives-wind-subsidy-introduces-low-cost-loans.html accessed May, 2013.

Burniaux, J. M., J. Chanteau, R. Dellink, R. Duval, and S. Jamet (2009), 'The Economics of Climate Change Mitigation: How to Build the Necessary Global action in a Cost-effective Manner', *Economics Department Working Papers* No. 701, 2009.

DFID (2011), 'Cash Transfers Literature Review', Department for International Development", *Policy Division* 2011, UKaid, April, 2011.

EEA (2004), 'Energy Subsidies in the European Union: A Brief Overview', *Technical report* No 1/2004, European Environmental Agency, 2004.

ET (2013), *The Economic Times: "Costly Kerosene Makes Way for Diesel"*, January 14, 2013.

Fiszbein, A., and N. Schady (2009), 'Conditional Cash Transfers: Reducing Present and Future Poverty', Policy Research Report, Washington, D. C. : World Bank.

Garcia, M., and C. Moore (2012), *The Cash Dividend: The Rise of Cash Transfers in Sub-Saharan Africa*, Washington, D. C.: World Bank.

IHT (2005), The International Herald Tribute, 'India Should Redirect Subsidies to those Who Need Them', *The Global Edition of The New York Times*, 2005.

IIFL (2013), 'India Ratings: Oil and Gas sector awaits strong subsidy reduction measures', *India Infoline News Service*, January 17, 2013.

IMF (2013), *Energy Subsidy Reform: Lessons and Implications*, International Monetary Fund, Jan, 2013, Available at: http://www.imf.org/external/np/pp/eng/2013/012813.pdf, accessed April 2013.

MNRE (2013), *Ministry of New and Renewable Energy, Government of India*, Available at: http://www.mnre.gov.in/related-links/grid-connected/biomass-powercogen ,(accessed Mar, 2013).

MNRE (2013a), *Ministry of New and Renewable Energy, Government of India*, Available at: http://www.mnre.gov.in/related-links/jnnsm/introduction-2/ (accessed May, 2013).

MoP, (2013), *Report of The Working Group on Power for Twelfth Plan 2012-17*, Govt. of India, Ministry of Power.

Morgan, T., (2007), 'Energy subsidies: their magnitude, how they affect energy investment and greenhouse gas emissions, and prospects for reform', UNFCCC Secretariat Financial and Technical Support Program, 2007.

Nigenda G and L. M. González-Robledo (2005), 'Lessons offered by Latin American cash transfer programs, Mexico's Oportunidades and Nicaragua's SPN: Implications for African Countries', for DFID Health Systems Resource Centre, Available at: http://www.eldis.org/fulltext/verypoor/5_ningenda.pdf

OECD, (2008): "OECD Environmental Outlook", Organisation for Economic Co-operation and Development (OECD), Paris, 2008.

OCI, (2012), Oil Change International, 'The Price of Oil: Exposing the true costs of Fossil Fuels', International Fossil Fuel Subsidies, Oil Change International, 2012.

Pershing, J., and J. Mackenzie (2004), 'Removing Subsidies. Levelling the Playing Field for Renewable Energy Technologies', *Thematic Background Paper*, Secretariat of the International Conference for Renewable Energies, March, 2004.

Planning Commission Report (2012), *Annual Report, Planning Commission of India*, New Delhi: GoI.

PPAC (2013a), 'Under-recoveries to Oil Companies on Sale of Sensitive Petroleum Products', Petroleum Planning and Analysis Cell, New Delhi, Available at: http://ppac.org.in.

PPAC (2013b), Petroleum Prices and Under-Recoveries, Petroleum Planning and Analysis Cell. New Delhi, Available at: http://ppac.org.in.

PIB (2013), Press Information Bureau, GoI, website http://pib.nic.in/newsite/erelease.aspx?relid=89319. (accessed April, 2013).

Saunders, M., and K. Schneider (2000), 'Removing energy subsidies in developing and transition economics', *ABARE Conference Paper, 23rd Annual IAEE International Conference*, International Association of Energy Economics, Sydney, 2000.

TOI (2012), The Times of India, 'New plan to cut thriving black market of kerosene', *India`s National Daily*, June 10, 2012.

TOI, (2013), The Times of India, 'Highlights of Union Budget 2013-14', *India's National Daily*, February 28, 2013.

UNEP (2002), 'Reforming energy subsidies', United Nations Environment Program, Division of Technology, Industry and Economics, 2002, IEA/UNEP, ISBN 92-807-2208-5, 2002.

UNEP (2003), *Energy Subsidies: Lessons Learned in Assessing their Impact and Designing Policy Reforms*, United Nations Publication, September, 2003.

UNEP (2008), Reforming Energy Subsidies/ The Impact of Energy Subsidies, DTIE, Available at : www.unep.org/pdf/pressreleases/reforming_energy_subsidies.pdf

WB (2009), *World Development Report*, Washington, D.C.: World Bank.

WEO (2008), *World Energy Outlook*, Paris: International Energy Agency.

WEO (2010), *World Energy Outlook*, Paris: International Energy Agency.

WEO, (2012), World Energy Outlook, *Energy Subsidy*, International Energy Agency, November 12, 2012.

Wikipedia (2013), *Iranian Subsidy Reform Plan*. Available at: http://en.wikipedia.org/wiki/Iranian_subsidy_reform_plan, accessed Jan, 2013.

XN (2012), Xinhua Net, *Indonesia advised to replace existing energy subsidy*. Chinese Daily Available at: http://www.xinhuanet.com/english (accessed January, 2013).