

Energy Security

Insights

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Special Issue: Fossil-fuel subsidies

This issue of *Energy Security Insights* focuses on the issue of fossil fuel subsidies. Being a strong advocate of reforms in the energy subsidy regimes followed in several countries, including India, I believe the potential unleashed by technology provides an unprecedented opportunity to customize tariffs for the continuum of consumers.

In the balance, however, one needs to recognize that the internationally traded prices of fossil fuels are not always at a market clearing equilibrium. The cartel of oil producers, have carefully managed the supply as well as the prices to meet their own revenue objectives. As such, using international prices as a benchmark to determine levels of apparent subsidy may in itself be a distortion. The issue of energy pricing necessarily has to be driven by national contexts and developmental priorities, while recognizing fully the consequences of specific pricing regimes on the environment—both local and global.

The argument that subsidies are, and will be, required by certain segments of the society to promote consumption of energy and, thereby enable a transition out of poverty levels, is widely accepted. The challenge is to be able to identify and stratify the different segments of population that would need varying levels of subsidy for meeting different end objectives. The other key challenge, of course, is being able to clearly signal the expected outcome to be derived from the subsidy. The development of biometric cards, along with provision of credit and banking facilities based on information technology, greatly eases the targeted delivery of subsidies for explicit purposes. Energy subsidies can finally be provided in a manner in which the consumer can decide how much energy he would like to consume, in what form, and for what purpose.

The key to efficient energy pricing (including the provision of subsidies) lies in being able to track the supply chain of energy and the consumption pattern exhibited by various consumer groups. The greatest challenges most often discussed in the context of energy subsidies are: the inability to ensure that subsidies are enjoyed by the targeted population; the development of parallel black markets with profiteering by middle-men; the adulteration of non-subsidized products with the subsidized ones leading to major environmental challenges in addition to revenue losses; the 'leakage' of subsidies across national boundaries, and so on. Ensuring full-cost financial pricing of all energy forms, with subsidies being delivered directly to the identified end consumer, would plug all of these loopholes with almost full effectiveness. Most importantly, the country would be able to understand the demand characteristics in a manner required to project demands more truly, plan for adequate supplies, and use public policy tools to manage demand effectively for multiple purposes.

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Fuel subsidies: issues and reform options

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Introduction

Governments in all countries, either directly or indirectly influence domestic prices for petroleum products (henceforth referred to as 'fuel'). Many governments, mainly in middle-income and low-income countries, directly control domestic fuel prices, often through the application of a pricing formula that explicitly links domestic fuel prices to the cost of domestic supply, the costs of storing and distributing fuel domestically, and a desired level of taxation. Even where governments do not directly control domestic fuel prices, they indirectly influence these prices through the imposition of fuel taxation.

The issue of fuel pricing received a great deal of global attention in the aftermath of sharp increases in international fuel prices during 2007 and early 2008. During this period, governments throughout the world came under political pressure to mitigate the adverse impact of higher fuel prices on their populations by decreasing fuel taxes or increasing fuel subsidies (IMF 2008). More recently, when the G-20 leaders met in Pittsburg in September 2009, they committed to rationalizing and phasing out inefficient fossil fuel subsidies over the medium term. The upturn in fuel prices since the end of 2009 and the ongoing emphasis on addressing climate change mean that the issue of fuel pricing is likely to remain high on the international policy agenda.

This article reviews key considerations that need to be taken into account in any debate regarding the appropriate approach to petroleum-product pricing. Many of the issues discussed are also relevant to the pricing of other fossil fuels such as coal and gas. The next section briefly discusses the basic economic principles that should guide economic policy towards the setting of domestic fuel prices to achieve efficiency, revenue, and income distribution objectives. Following this, the article discusses the recent evolution of international fuel prices, the extent to which changes have been passed through to domestic fuel prices, and the fiscal and environmental implications of fuel

pricing policies. Next, issues that need to be addressed when developing a strategy for reforming current approaches to fuel pricing are discussed. The last section offers some concluding remarks.

The economics of fuel pricing

Governments may wish to influence fuel prices to achieve a number of economic objectives including efficiency, government revenue, and equity objectives. Economic theory provides strong arguments for avoiding fuel subsidies, and even using fuel taxes as a source of government revenues. Fuel subsidies result in inefficiently high levels of fuel consumption, exacerbate the adverse impact of rising international prices on economies that are net importers of fuel, and reduce the benefits of rising prices for net exporters.¹ Less than full pass-through of increasing international prices to consumers dilutes the decrease in demand, thus further increasing international price volatility. Artificially low fuel prices also reduce the competitiveness of renewable energy technologies. Both the relatively low price elasticity of fuel demand and the negative environmental externalities associated with fuel use provide strong arguments for the taxation of fuel consumption. Also, if fuel prices are sufficiently lower than those in neighbouring countries, it can result in cross-border smuggling (so that the benefits of lower fuel prices accrue to foreign populations) and lost domestic fuel tax revenues or higher fuel subsidy costs.

From an efficiency perspective, therefore, the optimal fuel tax rate depends on factors that can differ across countries. For example, both total revenue requirements (reflecting the level of public expenditures) and the range of instruments available to raise this revenue differ across countries. Similarly, the nature and extent of environmental externalities may also differ, as may the range of environmental policy instruments available to address environmental concerns. However, efficiency considerations do suggest that fuel taxes in a country should be higher than the standard consumption tax. Note also that

* The views expressed in this article are those of the authors, and do not necessarily represent those of the IMF or IMF policy.

¹ Oil exporters often use fuel subsidies to share some of the gains from higher oil export prices across their populations. This results in inefficiently high levels of energy intensity both in consumption and production, and reduces current and future export earnings. These lost resources could be used much more efficiently to promote development through education, health, and other investments.

while efficient fuel pricing from a domestic revenue and environmental perspective can be achieved through national taxation policy, efficient carbon pricing to address global climate change requires international cooperation.

Although, in principle, lower fuel prices could be used on equity grounds to increase the real incomes of low-income households, in practice this is likely to be a very inefficient and costly approach to social protection. Not only do lower fuel prices distort consumption patterns, but most of the benefits of fuel subsidies are captured by higher-income groups. A recent review of the distributional implications of fuel subsidies in developing countries by Granado, Coady, and Gillingham (2010) shows that the benefits of fuel subsidies accrue mainly to higher income households, with the richest 20% receiving six times more in subsidies than the poorest 20%. The benefits of gasoline and LPG subsidies are the most regressively distributed, with the richest 20% receiving 20 and 14 times more in subsidies respectively. Although the consumption of kerosene is more evenly distributed across income groups, a substantial amount of kerosene subsidies is still captured by high-income households, with the richest 40% of households receiving 40% of subsidies.²

Even if the distribution of subsidy benefits can be made more progressive by focussing on fuels that are more important for the poor (such as kerosene in developing countries), this can result in a substantial distortion of fuel markets. For example, subsidized kerosene is often redirected to other sectors of the economy (such as with adulteration of other fuels) or smuggled abroad, resulting in shortages of kerosene among poor rural households and redirecting even a higher share of benefits to higher-income households.

Whether or not one wishes to use differential fuel taxation to achieve equity objectives will depend on the range of alternative policy instruments that are available to the government to redistribute income. Developed countries typically have access to more efficient transfer mechanisms. These include, for instance, progressive income taxes to redistribute from higher-income households to low- and middle-income households, and direct welfare transfers to redistribute to the poorest households. To the extent that these transfers can be “conditioned” on actions on the part of the beneficiary that enhance their human

capital (for instance, through training) and reduce welfare dependency over time, such redistributive policy instruments may give rise to efficiency gains as opposed to the efficiency losses associated with fuel subsidies. Although these more efficient redistributive instruments may not be available in developing countries, governments may still have access to instruments that are far less distortionary and much better targetted than fuel subsidies. At the very least, the above arguments indicate that there is likely to be a very high efficiency gain from strengthening social protection systems in these countries.

Fuel pricing in practice

The international prices of key fuel products increased dramatically between end-2003 and July 2008 (see Figure 1 below). Nominal prices increased approximately four fold over this period, with the sharpest increases occurring over 2007 and the first half of 2008. Although international prices decreased sharply during the second half of 2008, prices started to increase again from early 2009.

In their review of international experiences, Coady, Gillingham, Ossowski, *et al.* (2010) found that the extent of pass-through of higher world fuel prices to higher domestic prices has varied substantially across countries. Pass-through is defined as the absolute change in domestic prices as a proportion of the change in international prices, both expressed in domestic currency units. A ratio less than unity indicates falling fuel taxes or increasing subsidies. For gasoline and diesel respectively, around two-thirds

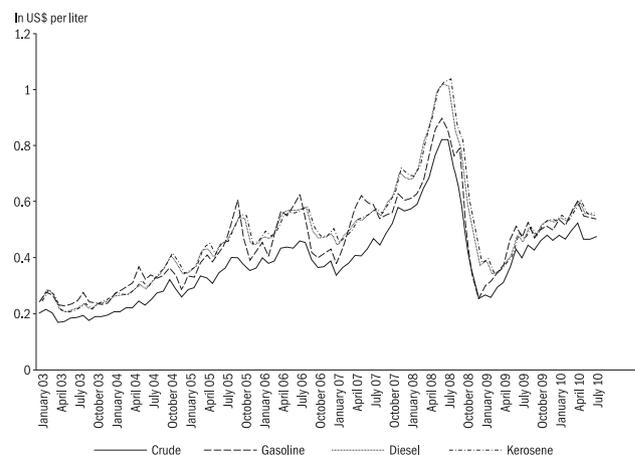


Figure 1 International petroleum product spot prices (2003-2010)
Source US Energy Information Administration 2010

² Evidence for developed countries (mainly for the United Kingdom and the United States) reveals that the direct welfare impact of fuel price increases is progressively distributed reflecting, for example, the low level of car ownership among low-income groups. However, the indirect effect of higher fuel prices on the prices of other goods, such as public transport and food prices, tends to mitigate the progressivity of direct effect.

and one-half of countries failed to fully pass through international price increases (see Table 1 below). More than three-quarters of countries did not fully pass through kerosene price increases. Pass-through was especially low for emerging and developing countries, for net oil exporters, and for countries that already had subsidies in 2003. Less than full pass-through of international price increases, therefore, resulted in substantial declines in fuel taxes, or increases in fuel subsidies, in many countries. Petroleum product tax revenues decreased in 73 countries, with the decrease exceeding 1% of GDP in 41 countries. Subsidies increased in 27 countries, with the increase in subsidies exceeding 1% of GDP in 22 countries.

The unwillingness of many countries to fully pass through the increase in international prices resulted in a sharp increase in global subsidies, which increased from \$60 billion in 2003 to \$520 billion by mid-2008. However, true economic subsidy should include the difference between actual and desired tax levels for fuel products to capture revenues foregone (i.e. tax subsidies). Based on a common desired tax level of \$0.30 per litre, these tax-inclusive subsidies increased from \$406 billion to nearly \$1,000 billion over this period, equivalent to 1.3% of global GDP. Emerging economies accounted for over half of these subsidies, with advanced economies accounting for about a quarter and developing economies one-fifth. Although subsidies decreased sharply in the second half of 2008, they are again on the rise with renewed

international price increases since early 2009. Tax-inclusive subsidies are projected to increase to \$740 billion by end-2010, equivalent to 1% of global GDP.

This increase in subsidies would occur in the context of a more challenging global fiscal situation. Many countries provided substantial policy support to address the consequences of the financial crisis. Of the 58 countries with pre-tax subsidies in 2010, 46 have a projected fiscal deficit in 2010, with the deficit expected to exceed 3% of GDP in 27 of these countries. Reducing pre-tax subsidies by one-half would decrease the average projected deficit in these subsidizing countries from 2.1% of GDP to an average deficit of 0.8% of GDP. Reducing tax-inclusive subsidies by one-half would result in the average deficit in 94 subsidizing countries falling by about one-sixth, from 6.3% of GDP to around 5.3% of GDP. Thus, fuel subsidy reform could make a significant contribution to fiscal consolidation efforts in these countries.

Containing subsidies would also have substantial environmental benefits in the form of reducing petroleum consumption and associated greenhouse gas emissions. Based on estimates by IEA, reducing pre-tax subsidies by one-half could reduce greenhouse gas emissions by nearly 5% by 2050. Reducing tax-inclusive subsidies by one-half would result in larger emission reductions of 14-17%. The potential gains are obviously higher if one takes a broader view of subsidies to include subsidies on other fossil fuels such as coal and natural gas.

Table 1 Median pass-through (end-2003 to mid-2008)

	Gasoline	Diesel	Kerosene
Passthrough (in percent)			
All countries	85	95	53
Advanced	102	120	-
Emerging	57	70	19
Developing	77	78	59
By oil trade:			
Importer	96	106	79
Exporter	35	46	11
By tax level (per litre), 2003:			
With tax greater than US\$ 0.30	99	119	111
With tax less than US \$0.30	65	90	64
With subsidy	42	58	48
Number of countries			
Total	155	135	63
Passthrough less than 1.0	102	71	49
Passthrough less than 0.75	65	54	40
Passthrough less than 0.5	33	31	28

Source Reproduced from Coady, Gillingham, Ossowski, *et al.* (2010)

Reducing fuel subsidies

Fuel subsidies are inefficient and a fiscally expensive approach to protecting the poor from rising international fuel prices. However, eliminating fuel subsidies can still have a sizeable adverse impact on poor households. The review by Granado, Coady, and Gillingham (2010) finds that, on average, a \$0.25 increase in domestic prices decreases household real incomes by 6.2%, with this impact being similar across all income groups. Therefore, it is important that reform strategies include measures to mitigate this adverse impact.

Where an effective social safety net exists, expanding the budget for these programmes can address concerns for poverty while containing the fiscal cost. For countries that do not have access to effective safety net programmes, a more gradual reform approach is desirable if fiscal conditions allow. This could involve maintaining kerosene subsidies over the short term and using existing programmes that can be expanded quickly, possibly with some

improvements in targetting effectiveness (for instance, school meals, reduced education and health user fees, subsidized mass urban transport, cash transfers to vulnerable groups, or subsidies for consumption of water and electricity below a specified threshold). Similarly, other public expenditures, such as education and health expenditures, as well as spending on infrastructure such as roads and electrification schemes, could be expanded.

Increasing retail prices to reduce fuel subsidies is always a politically sensitive issue. However, an effective public information campaign prior to reforms can increase public support for price increases by informing the potential beneficiaries (consumers and taxpayers) about the drawbacks of existing subsidies and the benefits of reform. Such a campaign should highlight the following:

- Price increases reflect fluctuations in international prices, which are out of the control of the government.
- Subsidies provide incentives for inefficiently high levels of fuel consumption and magnify the adverse impact of higher international prices for importing countries or reduce the gains for exporting countries.
- Subsidies have a high fiscal cost (this should be transparently recorded in government fiscal accounts).
- Higher income groups capture most of the benefits from fuel subsidies. When relevant, governments should also highlight that subsidies promote cross-border smuggling, shortages, black market activities, and corruption.
- Subsidies crowd out financing for priority public expenditures such as investments in education, health, and physical infrastructure.

Reforming fuel pricing regimes

A one-off reduction in fuel subsidies addresses only the symptoms and not the causes of this wasteful use of public resources. Avoiding the recurrence of fuel subsidies requires a new approach to fuel pricing in many countries. In countries with fuel subsidies, the government typically controls domestic prices. This creates the impression that price changes reflect government policy—rather than international factors, and creates political pressure to avoid passing through increases in international prices but also to pass through decreases.

The best approach to petroleum pricing is to implement a fully liberalized regime, accompanied

by appropriate regulation to ensure competition. As an interim measure, however, governments can adopt automatic pricing mechanisms. But the adoption of an automatic mechanism in itself is not a panacea, and many governments have abandoned these mechanisms rather than pass on international price increases. The fragility of automatic price adjustment mechanisms often reflects the reluctance of governments to fully pass through sharp international price increases that they believe may be temporary. If such price increases are persistent, this ‘wait and see’ approach can result in escalating subsidies, and substantial increases in domestic fuel prices are eventually required to contain fiscal costs. Since the public is likely to be more concerned about large price increases, reform becomes more difficult and subsidies become entrenched. However, to make automatic pricing adjustments more attractive, smoothing mechanisms can be incorporated. These smoothing rules can reduce the magnitude of retail price changes compared to full pass-through, ensure full pass-through of price changes over the medium term, and avoid long periods of fixed prices that eventually necessitate large retail price increases if international price increases turn out to be persistent.

Recent experience has shown clearly that the current approach to fuel pricing in many countries poses a sizeable fiscal risk to governments and distorts fuel markets. The recent rebound in international fuel prices emphasizes the urgency of reforming fuel pricing policy to avoid wasting public resources that should be directed at reducing poverty and promoting development. Not only is this in the self-interest of national governments, but it is also a key requirement for addressing global climate change.

References

Coady D, Gillingham R, Ossowski R, *et al.* 2010. **Petroleum Product Subsidies: Costly, Inequitable, and Rising.** Washington, DC: International Monetary Fund. [IMF Staff Position Note, SPN/10/05].

Granado Arze del J, Coady D, and Gillingham R. 2010. **The Unequal Benefits of Fuel Subsidies: A Review of Evidence for Developing Countries.** Washington, DC: IMF. (Forthcoming).

IMF (International Monetary Fund). 2008. **Fuel and Food Price Subsidies: Issues and Reform Options** (Washington). [Available at: <http://www.imf.org/external/pp/longres.aspx?id=4293>]

US Energy Information Administration. 2010. **Oil Prices and Outlook.** Washington: Energy Information Administration. [Available at: http://www.eia.doe.gov/energyexplained/index.cfm?page=oil_prices]

International cooperation: the key to increasing fossil-fuel subsidy reform*

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National reform efforts have disappointed for many years – international cooperation has been the missing ingredient

The benefits of fossil-fuel subsidy reform are both widely recognized and wide in scope. To improved energy security, lower local pollution and reduced climate change, we can add a key component in times of fiscal austerity – paying down national debt. The majority of these benefits accrue to the nation making the reforms. However, unlike parts of the currently stalled trade and climate change negotiations, subsidy reform is not a zero sum game—the gains of one country from its reforms are generally not reflected in losses in other countries.

Almost all countries could benefit from subsidy reform: while it is the subsidies to energy consumers prevalent in developing countries which have received the majority of attention, energy producers in both developed and developing countries continue to receive government handouts. One of the key conclusions from reform experience to date is that while reform will typically bring benefits to the economy as a whole, the redistribution of income is likely to create some losers. If these are the poorest members of society or powerful vested interests, compensatory measures are likely to be required as part of the reform package.¹

For more than two decades, studies and policy advisors have advocated subsidy reform—pricing energy at economically efficient levels. There has been some success but progress has been painfully slow. Somewhat counter-intuitively for what is essentially a national issue, a key missing ingredient has been international cooperation. One only has to look at the level of political interest, articles and blogs, and reports and conferences during this year compared

to the level before the G-20 Leaders' Summit committed to fossil-fuel subsidy reform in Pittsburgh 2009, to realize how it has transformed the debate.

International cooperation can provide essential support to national efforts to reform fossil-fuel subsidies. In addition to supplying political legitimacy and peer pressure, it offers research and technical assistance, sharing of information and best practices, establishment of rules, financial support, and increased accountability. This article explores how international cooperation can best be encouraged over the next 12 months, 1-3 years from now, and in the longer term. It explores what roles international organizations including the World Trade Organization (WTO), the United Nations Framework Convention on Climate Change (UNFCCC), International Energy Agency (IEA), Organization for Economic Cooperation and Development (OECD), the World Bank, the International Monetary Fund (IMF), and a range of other actors could play.

Two obvious choices for an institutional home

The WTO is the obvious first choice to pursue fossil fuel subsidy reform. It has over 150 members and a mature dispute settlement mechanism, and its Agreement on Subsidies and Countervailing Measures (ASCM) requires these members to report their subsidies. The Global Subsidies Initiative's (GSI) analysis confirms that an agreement within the WTO has many attractions – but also that, with the Doha Round seemingly at a standstill, this could only be a possibility in the longer term.

The work needed prior to introducing new negotiations at the WTO—gathering information and building consensus—should not be underestimated. There is a further challenge: subsidies are generally

*This article is largely a summary of the Global Subsidies Initiative's recent report: Increasing the Momentum of Fossil-Fuel Subsidy Reform: A Roadmap for international cooperation. This report contains full analysis, details and references supporting the article, and is available for download at: <http://www.globalsubsidies.org/en/research/international-co-operation-reform>. For further details, please contact Peter Wooders (pwooders@iisd.org) or Kerry Lang (klang@iisd.org).

¹ For more on the political economy of subsidy reform and for successful reform strategies, see GSI's publications: *The Politics of Fossil-Fuel Subsidies* and *Strategies for Reforming Fossil-Fuel Subsidies: Practical lessons from Ghana, France and Senegal*, part of the *Untold Billions* series available at <http://www.globalsubsidies.org/en/research/fossil-fuel-subsidies>

only actionable (subject to challenge and remedy) when one country's subsidies can be proven to distort trade and hence cause damage in other countries. With energy being only one input to production—and with many subsidies being given to sectors such as residential and private transport which have no direct link to production—incorporating energy subsidy reform in general would require a mandate to negotiate disciplines that reach beyond trade impacts. Some progress could be made in the near term by the WTO improving its members' reporting on subsidies.

If not the WTO, how about the UNFCCC? The UNFCCC membership is essentially global, and climate change is a key rationale for subsidy reform in many countries. The UNFCCC may be struggling to define its post-Kyoto architecture but based on a thorough analysis of its legal framework, the GSI has identified two potential entry points for including subsidy reform—one for developed countries, and another for developing.

There is nothing stopping the UNFCCC from introducing a mechanism including a specific measure (or measures) that developed countries should adopt. This has clear attractions compared to negotiating a whole new agreement and, if recommendations are non-binding, they would be much quicker and easier to negotiate and implement. Discussions concerning developing countries all suggest that their commitments are likely to be based on their policies. Whether these are defined as nationally appropriate mitigation actions (NAMAs) or otherwise, subsidy reform seems a perfect fit and could be supported technically or financially by the developed world. The UNFCCC might be moving slowly towards a full agreement but we could envisage quick progress on more specific voluntary actions. Such progress would help the UNFCCC demonstrate its continued relevance.

The analysis presented above shows some areas of promise but is largely theoretical. Progress in either forum needs a group of national champions willing to push for change, and with enough energy and influence to convince the wider group of countries to devote scarce negotiating time and resources.

A roadmap for progress

Relying on a major agreement within the WTO or UNFCCC may require patience, and may not guarantee success. Nevertheless, progress on energy subsidy reform has been significant over the past 12 months.

Countries such as Indonesia, India, and Iran are attempting to reduce their subsidy burden. The US has highlighted selected federal tax breaks it is willing to roll back. And internationally, the G-20 and Asia-Pacific Economic Cooperation (APEC) have provided the necessary political leadership, having made commitments in 2009 to “phase out and rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption.” The “Friends of” country champions group, so effective within the fisheries subsidy discussions, has a new counterpart. At the launch of the GSI's *Untold Billions* report in Paris on 3 June 2010, New Zealand announced that they were establishing a “Friends of Fossil-Fuel Subsidy Reform” group which now includes Denmark, Norway, Sweden, and Switzerland, with membership from developing countries under discussion.

A collaborative approach is needed, driven by country champions and supported by a mosaic of organizations (see Figure 1 below):

- **Next 12 months:** *Strengthening, extending and coordinating.* Countries need to be encouraged to develop, and make public, their subsidy reform plans. The G-20 decided to keep subsidy reform on its agenda at the Leaders' Summit in June 2010; their continued leadership including

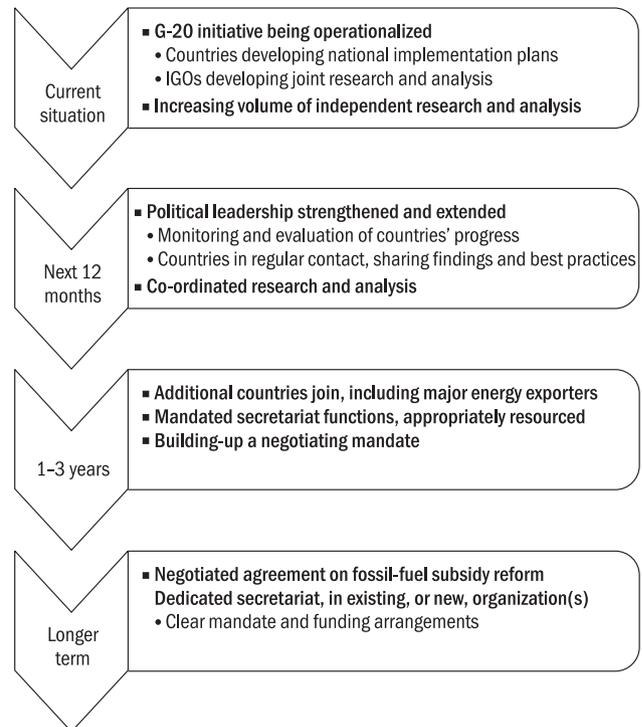


Figure 1 International cooperation for fossil-fuel subsidy reform

Key information and analysis required to support reform

- Data series of subsidies to energy consumers, disaggregated by country and by fuel. Sensitivity of results to key drivers such as oil price and the choice of financial conditions (for example, discount rate). Transparency on the assumptions made as to whether low taxes constitute subsidies, and the data and methodologies used to estimate the generation, transportation and storage costs needed to calculate the 'price-gap' between user prices and what prices would be in a free market.
- Robust, transparent estimates of production subsidies on a national basis, covering the full range of potential subsidies. Progressive discussion and agreement on methodologies for calculating these subsidies. (Refer to the GSI's policy brief and technical manual on how to measure subsidies to fossil-fuel producers at <http://blog.iisd.org/2010/07/29/a-how-to-guide-for-measuring-subsidies-to-fossil-fuel-producers/>.)
- Analysis and information to support countries considering reform, in whatever form this is required. The need to demonstrate that economic output will be increased by reform in both the short- and long-terms, and that the poor can be compensated, are essential components. The strongest evidence comes from the successful experience of others.

the Seoul and Paris Summits over the next 12 months remains essential. The support of APEC and the "Friends" group, and gradual incorporation of other countries into a mutually supporting network, will strengthen and extend commitments. Also, there is a continued need for quality information and analysis—including on the politics and the realities of the challenges faced by potential reformers—provided by governments, NGOs, IGOs, and others, ideally with greater coordination of their activities.

- **1–3 years:** *Embedding and building for a future agreement.* Compared to 2009, many countries are already much more capable of discussing subsidies and considering what commitments they could make. Assuming that the issue of subsidy reform becomes embedded in the G-20, international cooperation needs the support of more formalized secretariat functions – to arrange meetings of experts, provide analysis, and set up reporting and review mechanisms. In the next 1–3 years, the ground will need to be prepared for future negotiations on an agreement, almost

certainly by a relatively small group of champions taking steps to secure mandates at the WTO and/or the UNFCCC;

- **Longer term:** *A negotiated agreement on fossil-fuel subsidy reform.* The ideal end point would see a negotiated agreement housed in a single institution (noting that secretariat functions could be provided externally). The chosen institution could be the WTO, but stiff challenges remain to progressing negotiations and expanding their scope beyond subsidies which impact trade. The UNFCCC may also be a possibility – its attractions were discussed earlier in this article. But choosing a winner at this stage seems premature. The G-20 has shown that political leadership may come from smaller groups of countries in the future, and, in general terms, much depends on the interests and strategies of the US and China. The IEA's and OECD's membership and focus appears to exclude them from housing an agreement, although their information and analysis are essential supporting pillars. An NGO—or potentially even a new organization—remains an option. Preparing for a negotiated agreement can—and indeed should—begin now, but on the basis that there may be several end points to the journey.

Opportunity knocks – for the moment

Fossil-fuel subsidy reform is currently under serious consideration by countries around the world. A key element of this has been the political leadership and international cooperation given by the G-20. But a range of other factors—fiscal constraints resulting from the financial crisis, high and volatile energy prices and energy security concerns, the need to progress actions to reduce emissions of greenhouse gases whilst the UNFCCC process struggles—are making reform a relatively easy sell. This may, or may not, continue.

International cooperation is a key piece of the jigsaw. Jumping immediately to an international agreement, housed within a single institution, does not seem possible – it is a longer-term aim. But there is progress currently on reform, and this can be strengthened by a range of disparate actors supporting national reformers. It is national reformers who need to take the bold steps, and there is much that can be done to help them.

The fossil-fuel subsidy regime in India

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Introduction

Subsidies have been prevalent in India since independence. It includes the supply of goods and services to sections of the population for free, or at prices below that charged to others, or at prices that are less than the cost of the good or service. Food grains, sugar, cotton mull and long cloth, kerosene, liquefied petroleum gas, diesel, coal, fertilizers, edible oil, water, electricity, rail and bus fares, airline tickets, health services, education, and many other commodities and services have all been subsidized in the past, while many continue to be subsidized to this day. In a 'socialist' and democratic republic such as India, it is inevitable that many of the deprived sections of society and powerful vote blocs will be given subsidies. As a result, the supply of food grains, health care, and educational services to the poor below cost is considered to be a desirable element in social policies. Similar arguments are provided for other subsidies.

While being beneficial, subsidies pose a number of problems as well. For example, they distort the market and the effect of price signals on supply and demand. Groundwater levels in India have been depleted because of free or cheap electricity and cheap diesel made available for the operation of pumpsets to extract ground water. These factors have led to the cultivation of water-intensive crops on lands that are not suited for the purpose, thereby leading to the deterioration of the land's arable quality. The pumpsets used are highly energy inefficient, and are estimated to consume 40% more power on average. The supply of cheap kerosene to the poor has led to its diversion in adulterating diesel for road transport. Further, the government in India does not always fully reimburse the producer for the subsidies put in place. Instead, the producer is expected to compensate for his costs by charging more from other consumers. These 'cross-subsidies' give distorted signals to investment decisions.

Petroleum product subsidies in India

As far as fossil fuels are concerned, India subsidizes petroleum products (diesel, liquefied petroleum

gas, or LPG, natural gas, coal and the resultant electricity). With petroleum product prices being fixed by the government through state-owned enterprises, the lower prices of diesel are recovered by higher prices of petrol and aviation fuel. This leads to the unintended consequence of consumers purchasing diesel vehicles (luxury cars and sports utility vehicles, or SUVs). As a result, road transport gets precedence over the environmentally friendlier rail transport, which runs largely on electricity.

LPG subsidies

Subsidized sale of LPG has no social justification since its consumers are the better-off segments of society and not the poor. Instead of catering specifically to the worse-off or worst-off (below poverty line) sections, this subsidy clearly benefits the affluent urban middle class. There is also the issue of LPG cylinders designed for use in kitchens getting illegally diverted for use in automobiles. LPG cylinders used in hotels and restaurants also re-route government finances to their affluent visitors, and not the poor. The urban middle class is a politically vocal and influential segment who the politicians are loathe to offend. Here again, refinery companies resort to loading the subsidy costs onto their non-subsidized products.

Natural gas subsidies

Natural gas has been a peculiar subsidy story. Until recently, the government sold natural gas from state-owned enterprises at prices much lower than those charged by private enterprises. It would have been a more rational approach to differentiate between domestically produced gas and imported gas. Domestically produced gas could have been priced at a level so as to enable its heavily subsidized end products such as electricity and fertilizers to maintain low prices, as politically desired by governments while assuring producers of an adequate return on investment to cover exploration and production risks. The argument here is not against subsidized electricity and fertilizers, but rather that these products be priced in full for all, while the deserving

poor be identified and given vouchers so as to enable them to purchase these products at lower prices.

Electricity subsidies

Of all the subsidies, the one on electricity is perhaps the most complicated. Electricity is sold below cost to the poor. In fact, the price falls even further if we take into account the higher cost of servicing small consumers. However, there is no foolproof system to identify the poor. Consequently, many times it is the undeserving who avail the benefits of subsidized electricity, at the expense of the needy. Farmers in a number of states are offered below-cost electricity, while in states like Tamil Nadu, Punjab, and Karnataka, electricity is provided for free. In such cases, there is no limit on the number of pumpsets that can be run. Neither is there any restriction on the nature of crops that can be grown. Consequently, many dry lands now grow wetland crops that require a lot of water, thereby eliminating all notions of comparative advantage. There is no limit on the amount of underground water that can be pumped out, neither is there any metering of the water drawn in this manner. A poor farmer with a shallow well next to a farmer who has a pumpset sees his well running dry as the neighbour draws out water from the same water basin that supplies both wells. In other words, the better-off farmer benefits at the cost of the poor one.

Another group that enjoys electricity subsidies is those who steal electricity. In some localities, a local godfather organizes this supply and assumes the role of the electricity distributing company. Consequently, the state loses legitimate revenue. In several industries and commercial establishments, electricity officials collude in diverting all or some of their electricity needs from the distributing company through theft. This, of course, distorts the price of the end product or enriches the thieving industry or the commercial establishment.

Coal subsidies

Coal is a nationalized sector in India. It is beset with problems of theft, poor quality, unreliable delivery, uncertain costs, and short supply. With

the political agenda not allowing denationalization, the government has adopted novel means. Coal is supplied to end users like electricity generators, and steel and cement industries through long-term contracts or through the allotment of 'captive mines'. Captive mines are the allotment of selected coal mines to the generating company or other producers. In the case of electricity, such mines are allotted mainly to those who win power generating projects through competitive tariff-based bidding. In such a scenario, except for the cost of extracting and transporting the fuel to the generating plant, producers do not have to take account of the cost of the fuel. This results in a windfall since the end product's price is determined by the market, and is not regulated.

Conclusion

Subsidies distort the normal market-determined supply and demand, particularly in the cases of fossil fuels and their products. When governments delay or do not reimburse full subsidy costs, the enterprise delivering the product or service suffers either in terms of depleted cash flow or actual loss. The woeful situation of state-owned oil companies in India is a pertinent example. State-owned companies will not meet the aims of social policy until the beneficiaries can be properly identified and targeted for the subsidy. The delivery of the product or service at a subsidized rate results in misuse and diversion, so much so that the desired beneficiary does not use it, but sells off the product or service. It might be better if the beneficiary, when identified, receives the cash difference to which he is entitled as subsidy, and is allowed to use the subsidy money to buy the product or service or anything else he/she wants at market prices. This will obviate the need to keep separate accounts of the subsidized consumers and the quantity delivered to them. The Unique Identity Number Project, now under development, should be able to help identify the target beneficiaries better. This will help to substantially reduce the extra costs incurred by the government as a result of the subsidies not reaching the intended target.

Rationalization of petroleum product prices in India

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Introduction

The decision taken by the government of India in June 2010 to make petrol prices market-determined rather than government-controlled brings to light the critical issue of pricing of petroleum products. This article draws from a paper with the same title prepared by the Centre for Research on Energy Security, TERI. It aims to highlight the key issues that both affect and determine the pricing of petroleum products in India.

India's energy basket largely comprises coal, petroleum, natural gas, and hydro-power. Of these, coal has the largest share (approximately 49%) in the total commercial energy consumption in India. This is followed by petroleum products, which account for more than 37% of the country's total commercial energy consumption (2006/07). India is, however, not endowed with significant oil reserves, and nearly 79% of the crude oil consumed in the country is imported. This dependence on imports is expected to rise further to 91% by 2031/32 (TERI 2009).

Within petroleum products too, the consumption is skewed towards four products—petrol, diesel, liquefied petroleum gas (LPG), and kerosene—which together account for nearly two-thirds of the total product consumption in the economy (see Petroleum Planning and Analysis Cell 2010). Further, due to absence of substitutes and alternative energy sources, petroleum products typically have low price elasticity. This means that as the prices of these products increase, their demand does not decrease proportionally. Consequently, if the household income remains unchanged and the prices of these products rise, the proportion of household income spent on procuring these products rises. Also, fluctuations in prices of products like kerosene, which is the primary source of lighting and cooking fuel in rural areas, significantly affect the affordability of the poor to purchase these products.

This dependence on petroleum products has made the prices of petroleum products a vital political subject, thereby prompting the Indian government

to control the final prices of petroleum products for more than four decades. However, oil is a scarce resource and the prices of petroleum products should adequately reflect the scarcity value of the product.

This article looks at the pricing of petroleum products as it has evolved over time, and the ramifications of the pricing regimes on various stakeholders, and concludes by suggesting a way forward.

Evolution of petroleum product pricing in India

Over several decades now, the pricing of petroleum products has been determined by government policies. The policy shifted from import-parity pricing to administered-cost-plus pricing in the late 1970s. This was followed by a return to import parity and then to trade parity pricing, and most recently (in June 2010) to market-determined pricing mechanism. This section briefly describes the latest changes in the pricing policy of the government.

The administered pricing mechanism (APM) regime introduced in the 1970s continued till 1998, when its phased dismantling was proposed. It was decided that the prices of all products other than LPG and PDS kerosene would be determined by the market. The APM was to be phased out over a period of four years, and by 2002 it was to be completely abandoned and replaced by a market-determined pricing mechanism. Under the new regime, the retail prices of products were to be determined on an import parity basis.¹

The free-market mechanism continued till 2004, when international crude oil prices started rising and a price band mechanism had to be introduced. It was decided that the oil-marketing companies (OMCs) would be allowed to change prices within a band of +/- 10% of the rolling average of the previous 12 months and the international cost and freight (C&F) prices of the previous three months (GoI 2010). This band was, however, breached owing to an increased volatility in international crude oil prices. Even the price band mechanism had to be eventually

¹ Import parity price (IPP) is the price that would typically be paid for a product if it were to be imported rather than produced domestically.

abandoned, only to be replaced by an ad-hoc pricing mechanism.²

In 2006, following the recommendations of the Rangarajan Committee a trade parity pricing (TPP) mechanism was adopted for petrol and diesel.³ Further, it was suggested that these trade parity prices would act as indicative ceilings, and the OMCs would be allowed to fix the actual retail prices. It was expected that this would make the retail prices more competitive. It was also suggested that the provision of subsidies on kerosene be limited only to the below-poverty-line (BPL) families and that the subsidy on LPG be completely eliminated.

The suggestions of the committee were, however, only partially implemented. The refinery gate prices were set on a TPP basis and the taxes were rationalized. But at the retail level, these products continued to be sold below the trade parity levels, thus leading to mounting under-recoveries for the OMCs.⁴

Also, the subsidization of kerosene and LPG continues till date. The need to restrict the provision of subsidies on kerosene only to the BPL families was further reiterated by the Chaturvedi Committee in 2008. The committee also suggested that this provision be undertaken either through smart cards or direct cash transfers to the poor. However, the government continued to provide subsidies and the under-recoveries have continued to increase.

In sum, ever since 2004, the government has been following an ad-hoc pricing mechanism with the objective of shielding the domestic economy from international crude oil price shocks. This has had financial and efficiency repercussions on the economy at both the macro and micro levels. Time and again, piecemeal efforts have been made to reduce these impacts, but the interventions have clearly not been sufficient as the under-recoveries on petroleum products continue to mount, and the incomplete pass-through of high crude oil prices to the retail product prices continues to drive inefficient consumption of petroleum products.

However, the government made a concerted effort to improve the pricing mechanism when it decided to

implement the recommendations of the Kirit Parikh Committee (February 2010) by decontrolling the prices of petrol in June 2010. The prices of diesel are also expected to follow suit.

Impact of the current pricing policy

The ad-hoc pricing mechanism affects different segments of the economy in different ways. While the industry and economy are influenced directly, the consumers are affected in a more indirect manner. This section takes a look at these direct and indirect effects and their implications on the economy, on the oil industry, and finally on the consumers.

On the economy

The government compensates the OMCs in two ways—by issuing oil bonds and by providing budgetary subsidies. While the budgetary subsidies are only about 3% of the total under-recoveries (2008/09), these do have an impact on the fiscal balance of the economy (Figure 1). The oil bonds, on the other hand, constitute a significant portion of the total under-recoveries (70% in 2008/09). These bonds are typically issued with a maturity period of 5–7 years and are treated as an ‘off-budget’ expense (not included in the government’s budgetary subsidies). This, in a way, underplays the level of subsidies provided to the sector. However, as these bonds start to mature, their fiscal burden will begin to be felt by the government. At that point, these bonds will not only have a direct and immediate fiscal impact, but also long-term opportunity cost in the form of potential funds drawn away from development-related investments.

Even at present, these bonds have a detrimental effect on the fiscal health of the economy. In 2008/09, the fiscal deficit for the country stood at 6.62% of the GDP (with inclusion of the oil bonds) that grew to 8.06% (Reserve Bank of India 2010). This has had implications on the sovereign credit ratings of India. In February 2009, the international ratings agency Standard & Poor’s (S&P) downgraded India’s long-term sovereign credit rating from stable to negative. This was done on account of worsening government

² The price of crude oil became increasingly volatile beginning June 2004, and rose to almost \$132.47/bbl in July 2008 (Indian Crude Basket). This was when most governments across the world, especially those in the developing countries, took steps to shield the domestic economy from the global volatility.

³ Under this mechanism, the domestic prices of these products would be a weighted average of import and export parity prices in a ratio of 80:20.

⁴ Under-recovery is the gap between the refinery gate price paid by the OMCs to purchase the petroleum products, and the retail (managed) price at which the products are sold to the final consumers.

finances, which was expected to impact the capability of firms to raise overseas borrowing costs and also weaken the rupee.⁵ One of the reasons cited for the downgrade was the growing central budget deficit as a result of the government's large-scale off-budget issuance of oil bonds. This highlights how the current petroleum pricing mechanism has increased the financial instability in the central government's finances (IEA 2009).

On the oil industry

The oil industry has borne a significant share of the impact of the ad-hoc pricing mechanism. The national oil companies—both upstream and downstream—are affected by the pricing policy. From 2005/06 to 2008/09, the under-recoveries have risen significantly. Within a period of three years, these have increased from ₹400 billion (2005/06) to ₹1032.92 billion (2008/09), growing annually at a rate of around 37% (Figure 2). There has been a dip in the under-recoveries in 2009/10, following a decline in international crude oil price levels, as well as due to the recent price revisions (June 2010). However, in case there is a surge in international oil prices again, the under-recoveries will shoot up.

The oil bonds provided by the government are an inefficient mechanism of financing the oil companies as these are issued for medium to long term, and are only partly tradable. Also, the oil companies find it difficult to generate funds for working capital from these securities, and have increasingly been facing a short-term liquidity crunch. In order to arrange for adequate funds, these companies have had to borrow

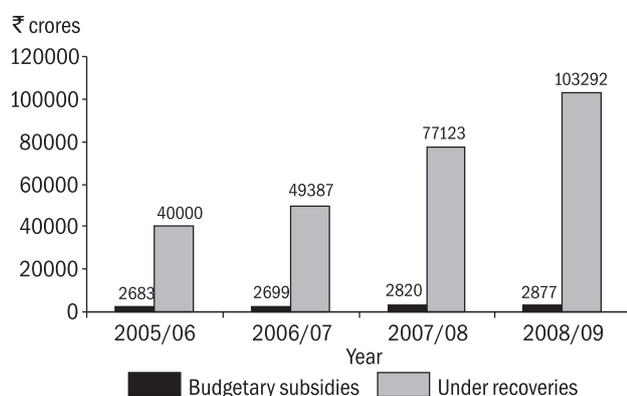


Figure 1 Budgetary subsidies vis-à-vis under-recoveries over the years
Source Petroleum Planning and Analysis Cell (2010)

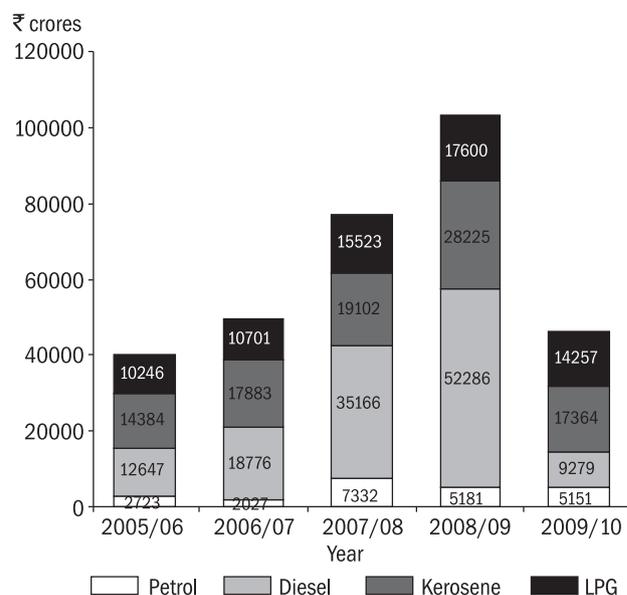


Figure 2 Level of under-recoveries over time
Source Petroleum Planning and Analysis Cell (2010)

from the market, and therefore, the component of debt in their capital structure has risen. Further, the oil bonds are issued at low interest rates (between 5% and 7%), and thus do not find many investors in the already saturated bond market of India. Also, since these bonds have not been given a statutory liquidity ratio (SLR) status, commercial banks are not willing to park their funds in these securities. As a result, to generate funds, the OMCs have had to sell these bonds at a discount. However, some relief has been provided to the OMCs by the Reserve Bank of India, which, under the agreement with the central Government, 'mops-up' excess oil bonds available with the companies by swapping them for foreign exchange (IEA 2009).

The impact of the ad-hoc arrangements has become visible in the bottom line of these oil companies. In other words, the net profits of these companies have been fluctuating, and have even been negative in some quarters (three quarters of 2005/06). Since these companies are vertically integrated, the cash flows from the alternative activities that they are engaged in provide them the necessary cushion to avoid suffering continual losses. But the profitability of oil marketing per se has declined substantially. This has also led to

⁵ See, 'S&P cuts India rating outlook on weak government finances'. Available at <http://www.livemint.com/2009/02/24134904/SampP-cuts-India-rating-outl.html>

limited private sector participation in marketing of transportation fuels in the country. Private companies such as Reliance, Essar Oil, and Shell India stopped operating in the retail markets in India due to escalating under-recoveries and absence of any government support to private players. The government does not compensate these companies. Although they are allowed to charge market-determined prices for their products, they cannot compete with the controlled prices of the national oil companies, and therefore, have chosen not to operate their oil pumps in the country.

While the downstream companies have had to directly bear the costs of the controlled retail prices in the form of mounting under-recoveries, the upstream companies have to share a portion of the under-recoveries of the OMCs by providing discounts. The burden on exploration and production (E&P) companies increased from ₹140 billion in 2005/06 to ₹320 billion in 2008/09. This amount represents the foregone investments these companies could have undertaken in the respective years.

Therefore, the pricing policy of the government has had adverse ramifications for the oil industry as a whole, where not only current profits but also future investments have been affected.

On the consumers

Typically, subsidies are introduced with an objective of making the subsidized products affordable for the poor and improve their accessibility. However, the extent to which these targets have been met is still limited. While the domestic economy may have successfully been shielded from fluctuating global prices, the penetration of these fuels remains limited, and so does the efficiency of their use.

In the domestic sector, LPG has been subsidized to increase its penetration as a clean energy fuel for cooking, and replace the use of biomass. As per the NSSO data (63rd round), almost 85% of rural households continue to depend on traditional fuels such as firewood, chips, and dung cakes as a source of cooking fuel. The penetration of LPG was limited to 9.1% of rural households. This also has implications on the health of the rural population (particularly women and children) as it leads to indoor air pollution (IAP), which, as per UNDP estimates, is the world's fourth largest health risk. Further, since these traditional fuels have to be collected, it imposes an added burden on the women and girls of the households—with the latter often having to forego

attending school. In the urban areas, on the other hand, almost 62% of households have access to LPG, thus implying that a large chunk of the total subsidies is being wrongly targetted.

Subsidized kerosene is used by almost 40% of rural households for lighting purposes. However, kerosene is an inefficient fuel for lighting. Moreover, since it is easily available, it is increasingly being used for adulterating diesel. According to a study conducted by the National Council for Applied Economic Research (NCAER), almost 40% of the kerosene consumed is siphoned off, highlighting the severity of the issue (NCAER 2005). Consequently, on the one hand the oil industry is making investments to make diesel a cleaner fuel, while on the other hand it is being adulterated, thereby negating all the investments.

The way forward

The recent price increase and decontrol of petrol prices are steps in the right direction. However, in the long run, the most economically sustainable pricing regime is to deregulate retail prices along with the imposition of a specific taxation structure. Further, the following suggestions need to be implemented in conjunction with rationalization of taxes:

Introduction of a targetted subsidy delivery mechanism

It is important that the subsidy mechanism be efficient enough to reach those who really need fuel subsidies. This can only be achieved by introducing a well-targetted subsidy mechanism. One way, as has been suggested by TERI as well as the Parikh committee (GoI 2010), is to link subsidies with the introduction of the unique identification number (UID) scheme. Another option is to transfer money directly to the poor via mobile banking.

Re-channeling kerosene subsidies to support renewable energy lighting solutions

Existing kerosene subsidies that mainly provide affordable lighting to rural areas can be discontinued by providing solar lanterns. As has also been suggested by the *Kirit Parikh* committee, the subsidy on kerosene in the electricity grid-connected villages can be gradually withdrawn, and villages that are still not connected can be provided lanterns using the funds that go into the subsidies. According to TERI estimates, if the kerosene subsidies are utilized for providing subsidized solar lanterns (3W-LED

lamps with costs of about ₹1500 per lantern), the government will be able to provide this clean source of lighting to all those rural households that are currently using kerosene for lighting in less than one-and-a-half years (TERI 2009).⁶ Such a scheme would not only provide a cleaner source of lighting to households, but would also substantially reduce the cost to the exchequer. This is because subsidies to support solar lanterns would entail a one-time support vis-à-vis regular outgo of subsidies to support kerosene usage, hence leading to fiscal benefits.

Participative approach to involve stakeholders in the policy-making process

It is also important that the various stakeholders—ranging from the producing companies to the final consumers—are involved in the rationalization of the petroleum product prices. It is also important to ensure that awareness of the pricing regimes, especially among consumers, is increased.

Rationalizing petroleum product taxation regime

Currently, taxes and duties on petroleum products form a significant proportion of revenues for the centre and state exchequer. In 2009/10, more than ₹1800 billion were collected from the sector as contribution to the government revenues. This is approximately 10% of the total receipts of the state and central governments (RBI 2010 and PPAC 2010).⁷ The current tax and duty structure of petroleum products define the tax rates in ad-valorem form (as a proportion of the prices). This implies that the prices of the products increase and the revenue accruing to the government also rises; thus increasing further the burden on the consumers.

It is important that the taxes imposed on petroleum products shift from the current ad-valorem structure to specific rates such that the taxes do not rise when crude oil prices are inordinately high. This will also ensure that the revenue of the government does not fluctuate with the volatility in crude oil prices.

Towards long-term objectives

In addition to the above points, it is also important to formulate policies that in the long term will help in shifting the consumption patterns away from petroleum and towards more sustainable and eco-friendly fuels. This can be achieved by giving a push to the research and development currently underway, and developing bio-chemicals that can act as substitutes for fuels.

References

- GoI. 2010. **Report of the expert group on a viable and sustainable system of pricing of petroleum products.** New Delhi: Government of India.
- IEA. 2009. **Petroleum prices, taxation and subsidies In India.** Paris, France: International Energy Agency.
- NCAER. 2005. **Comprehensive study to assess the demand and requirement of SKO.** National Council for Applied Economic Research.
- PPAC. 2010. **Petroleum planning and analysis cell.** Ministry of Petroleum and Natural Gas, Government of India. [www.ppac.org.in].
- Reserve Bank of India. 2010. **Handbook of statistics on Indian Economy 2010.** [Available at <http://www.rbi.org.in/scripts/AnnualPublications.aspx?head=Handbook%20of%20Statistics%20on%20Indian%20Economy>].
- TERI. 2009. **India's energy security: new opportunities for a sustainable future.** The Energy and Resources Institute: New Delhi. Paper submitted to Hon'ble Prime Minister of India.

⁶ Assuming a crude oil price level of \$ 80/bbl and a kerosene retail price of ₹ 12.08/litre.

⁷ The government receipts include both revenue and capital receipts of the state and central government while the contribution of the petroleum sector includes customs duty, excise duty, corporate tax, dividend, sales tax, and others.

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