

Energy subsidies have been a core policy in many parts of the world, typically aimed at achieving broader welfare and development objectives. Yet, in recent years a growing number of countries – Indonesia, Nigeria and Iran being some examples – have begun to reform their domestic energy pricing systems, in particular for fossil fuels and electricity. Part of the reason for this trend lies in the oil market, where higher prices since the early 2000s have rendered energy imports, and the mounting fiscal burden of subsidies that level the gap between international and domestic prices, ever more expensive for governments. But criticism of subsidies has also sprung from what increasingly many observers see as the ineffectiveness of many current subsidy systems in achieving their declared policy goals, such as promoting universal energy access and industrial value-added growth. Issues such as unequal access, demand growth in emerging economies, and the sustainable long-term use of energy resources additionally feature in this debate – reason enough for this special edition of the Oxford Energy Forum.

The debate is started by Laura El-Katiri and Bassam Fattouh, who explore in more detail some of the factors that have contributed to the controversy surrounding energy subsidies. They emphasise the difficulty of providing a universally accepted definition, and hence measurement, of subsidies. For this reason, quantifying the size and performance of subsidies remains a controversial task. Assessments of subsidies in place differ widely, while the reform of subsidies in the eyes of many governments remains costly – not least due to political considerations in view of mass protest and industrial action.

Joerg Spitzzy provides a close account of OPEC's perspective on energy subsidies. He points out that the

rationale for regulating energy prices, of protecting consumers against price rises and fluctuations, is today still as valid as ten years ago; this is in view not only of the potentially damaging effect of considerable price rises on emerging countries' macro-economic stability, but also in view of an estimated 2.7 billion people in the developing world who until now are unable to afford access to non-traditional sources of energy such as fossil fuels. Rather than condemning subsidies per se, he argues that the way in which subsidies should be assessed is to distinguish between efficient and inefficient subsidies.

Fatih Birol, Chief Economist at the IEA and responsible for the IEA's

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annual *World Energy Outlook*, offers an alternative view. He proposes a general rethink of fossil fuel subsidies, which in his view have many unintended consequences that contradict their original rationale. Under his assessment, the removal of fossil fuel subsidies could mean a triple-win situation for reforming economies: by cutting global primary energy demand, the removal of these subsidies could be an integral building block for tackling climate change; contribute towards greater energy security in both importing and exporting countries via reduced imports and increased availability of fossil fuels for exports; and make consumers globally more responsive to oil price fluctuations, and hence reduce volatility in international energy markets.

Several authors in this issue look more closely at specific country experience with the use and reform of energy subsidies. Paul Segal, Economics Lecturer at Sussex University, calls for the reform of fuel subsidies based on his observation of Mexico's case. Describing subsidies as 'both extremely popular and wholly unjustifiable', Segal proposes that alternative ways of distributing Mexico's oil revenues do exist, via a resource dividend, targeted or universal, models of which are already in place such as under the *Alaska Permanent Fund* or *Bolivia's Renta Dignidad*.

Anupama Sen of Oxford Institute for Energy Studies assesses the reform of energy prices in India. Highlighting first steps in the right direction, Sen emphasises that India's energy pricing system is still in transition. While some problems have now been displaced from one sector to the other, she also points out that the longevity of India's reforms will still need to be proven following the country's next general elections in 2014.

Damian Tobin focuses on subsidies in the petrochemical sector. He shows how in the Chinese case, economic necessity, mostly as a result of rapid growth of manufacturing in China, has forced the state to abandon the large-scale subsidisation of petrochemical products. He argues that the removal of subsidies has led to a remarkable and unusual opening up of China's state-driven petrochemical sector. However, China's pricing reform has also exposed refineries to volatile international prices without addressing the problems of small-scale and variable throughput; as well as to the political risk as the state retains the ability to force refiners to absorb increases in international prices.

Hamid Tabatabai and Shirin Narwani follow up more closely the Iranian subsidy reform. Tabatabai offers an overview of the reform process since December 2010. He concludes that 'the Iran model of reforming the system of energy subsidies is a bold attempt at pursuing the twin objectives of enhancing economic efficiency and social justice at the same time' but argues that 'while the extent of its success so far may be judged differently, its longer-term impact remains to be seen.' Narwani shares this assessment; in her view, the reform has succeeded in cutting energy demand beyond expectations, but the long-term viability of the country's compensatory scheme remains doubtful.

James Henderson discusses the case of Russia, which underwent a comprehensive, gradual reform of energy prices since the breakup of the Soviet Union. He suggests Russia's only remaining exception to the reform of energy prices, natural gas, has only been made possible by relatively higher netback prices for Russian gas exports, but that this factor hasn't saved the country considerable distortions on its domestic energy market.

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Why So Controversial? The Dilemma of Trying to Assess Energy Subsidies

LAURA EL-KATIRI and BASSAM FATTOUH explore why opinions on energy subsidies and their reform differ so much

Energy subsidies are a controversial policy tool, and assessing them confronts an analyst with an even greater dilemma. A lot of this is due to the nature of subsidies: they are by default elusive as a concept, and invite starkly differing views on which benchmark price to assess them against. Subsidies can be implicit or off-budget, and as such raise doubts by some as to whether they should indeed be considered subsidies at all. Subsidies are also intended to fulfil very legitimate policy concerns such as welfare and development objectives, with diverging views on the effectiveness of subsidies in delivering on these policy goals. Finally, adverse experience with failed reform, and the political cost of popular protest against energy price rises renders the reform of energy subsidies in the eyes of many policymakers too costly. What is needed is a more constructive approach towards energy subsidies – with the acknowledgement that subsidies may achieve some of the intended objectives but also have important unintended consequences.

A Matter of Definition

The elusive nature of subsidies is reflected in the various definitions used in the literature. At the very general level, a subsidy can be defined as ‘any government assistance, in cash or in kind, to private sector producers or consumers for which the government receives no equivalent compensation in return, but conditions the assistance on a particular performance by the recipient’. This definition (by the US Congress Joint Economic Committee in 1972) can lead to the categorisation of many different forms of government assistance as subsidies, including direct payment to consumers tied to consumption (cash subsidies), the administration of interest rates on consumer credits (credit subsidies), tax incentives (tax subsidies), procurement subsidies, and in-kind subsidies.

Others provide a more narrow definition of subsidy as a measure that

maintains prices for consumers below the market level or prices for producers above the market level or an action that reduces costs for consumers and producers by giving direct or indirect support. This definition underlies the price-gap approach, which remains the most commonly used method for calculating subsidies due to its simplicity. The price-gap approach compares the observed price for a good or a service against a certain benchmark or reference price. A joint report by IEA/OPEC/OECD/World Bank for the 2010 G-20 Summit in Toronto notes the existence of a major disagreement among international organisations concerning the choice of the reference price, and consequently ‘a commonly agreed definition of subsidies has proven a major challenge in the G-20 context and countries have decided to adopt their own definition of energy subsidies’. Specifically, international organisations such as the IEA and the World Bank estimate the size of the subsidy based on the differential between prices of fuels in international markets, and the price at which these fuels are sold domestically. On the other hand, the same report stated that ‘OPEC is of the opinion that the benchmark price to be used in the case of energy resource well-endowed countries should be the cost of production’.

Energy subsidies can be on-budget or off-budget. *On-budget* subsidies constitute explicit cash transfers made by the government to either the producer or the consumer receiving the subsidy, registered on the state’s budget (these are also referred to as *explicit subsidies*). For instance, a government may mandate that a public utility sets the selling price below the cost of production. The government then finances the public utility’s losses by transferring funds from the budget. These funds can be secured by cutting government expenditure in other areas, increasing direct or indirect taxes, and/or by borrowing in local or international markets.

Alternatively, a government may

decide to finance the subsidy programme through off-budget activities. Off-budget subsidies are less transparent and more difficult to calculate. For instance, where producers of fossil fuels sell domestically produced oil, natural gas or coal at production cost price, rather than at international market prices, one could argue that the effect is an *implicit subsidy*. This subsidy is invisible in the budget: it is the opportunity cost of foregone government revenues. Many producers would disagree with the classification of these pricing options as formal subsidies. In view of this controversy, quantifying the size of subsidies and their impact on national economies remains a tedious task, and one whose outcome is unlikely to be universally accepted.

Legitimate Objectives versus the Effectiveness of Subsidies

Domestic energy pricing policies often serve very legitimate broad welfare and development objectives. Critics of current subsidy systems tend to highlight what many see as a lack of effectiveness of subsidies in achieving these policy goals; where they are ineffective, they may indeed exacerbate existing socio-economic problems.

1. *Expanding access to energy.* According to the UN Environment Programme, an estimated 1.6 billion people have no access to electricity, while more than 2 billion people are still reliant on traditional fuels such as wood and charcoal for cooking and heating. Energy subsidies are often intended to help the poor access more qualitative sources of energy such as liquid fuels, LPG and electricity, by making them more affordable. Critics of energy subsidies point out the ineffectiveness of subsidies in specific country contexts. For instance, where fuel subsidies are universal (i.e. rather than targeted to individual beneficiary groups) they are often found to result in considerable leakages to higher income groups, which consume relatively more energy than low income groups. Where subsidy schemes are poorly

implemented, losses incurred by producers and distributors of energy, particularly in electricity, can result in systematic underinvestment within the energy sector; in such cases, subsidies may hamper infrastructure growth, such as electricity network expansions into rural areas.

2. *Protecting the poor.* Protecting households with low incomes from high fuel costs is considered to be one of the key factors behind subsidies. Energy forms an important part of the consumer basket, such that price rises proportionally hit low income groups most. Protecting energy prices – particularly for essential forms of energy such as electricity, and fuels consumed primarily by the poor such as kerosene – against price increases is often seen as one main tool by governments to protect the income of low income households. This factor is most relevant in countries where alternative social safety networks do not or not sufficiently exist. Critics of energy subsidies point towards the regressiveness of non-targeted subsidies – these benefit the rich by tendency more than the poor. Leakages to high income groups cost the state funds which would have been potentially available for alternative schemes, including targeted assistance based on contingency and economic need.

3. *Fostering industrial development.* Energy-intensive industries – such as cement, fertilisers, and petrochemicals – are likely to benefit the most from subsidies, as energy constitutes an important component of their intermediate cost. The rationale behind such subsidies is to induce firms to provide their goods and services to consumers at affordable prices; to help protect local industries against foreign competition; to enhance their export competitiveness; and to protect local employment. From a broader perspective, subsidising the industrial sector can, by promoting and protecting a national advantage, be part of a country's industrial and economic development planning. Critics of industry subsidies on the other hand argue that subsidies encourage inefficiencies and waste, owing to a lack of incentive to rationalise the energy input; and that they lead to a misallocation of resources towards energy-intensive industries which may not be internationally competitive in the absence of subsidies.

4. *Consumption smoothing.*

Governments can also offset temporary commodity price fluctuations by controlling energy prices, and there are good reasons for doing so: consumers and producers may incur costs in adjusting their consumption and production in the face of volatile energy prices. Subsidising domestic prices when prices in international markets are high, and increasing taxes when prices in international markets are low, can smooth consumption in the face of highly volatile energy prices. Critics may argue that many other costs of subsidies, for instance the often enormous fiscal burden they cause, outweigh the gains on the grounds of consumption smoothing. Some observers would also argue that energy subsidies in emerging markets isolate these markets from global energy prices, and hence stall the global demand response necessary to drive down prices for oil and other energy commodities.

5. *Avoiding inflationary pressure.* One of the main worries facing many governments is that international increases in prices of key commodities such as energy and food induce inflationary pressures. Energy is an important component of the consumer basket, and any increase in the price of energy is automatically reflected in an increase in the consumer price index (CPI). It is also argued that high fuel prices cause an upward shift in the cost structure of industries, which is then passed on to consumers. One of the key concerns of governments who are reforming subsidy systems is typically the possibility of causing upward inflation, eroding gains made elsewhere in the economy. Critics would argue that generally, the experience of holding down fuel prices through administered controls in order to control inflation is extremely adverse, as it leads to distortions in the economy that have to be removed at a later stage. Furthermore, if not financed by cutting government expenditure in other areas or increasing taxes, financing energy subsidies could induce inflationary pressures, for instance by increasing pressure on money creation.

6. *Political considerations.* Fuel subsidies are often very popular and they can therefore be introduced or increased, as appropriate, to alleviate popular discontent. In addition, in countries with large own hydrocarbon reserves, citizens often consider low-priced energy as a right rather than a privilege. Following from this

perspective, governments may see energy subsidies as a policy that provides citizens with what they demand – where critics would add that the positive and negative impacts of subsidies are not necessarily well enough understood by the public.

Reforming Subsidies

Energy subsidies are often entrenched in institutional barriers and lock-in mechanisms, which makes it difficult to abolish them. This is because subsidies, by definition, entail the creation of rents for certain industries, regions, or groups of people. Since these rents accrue disproportionately to certain groups (industrialists or particular classes of consumers) while the costs are widely spread, the prime beneficiaries of the rents will always have an interest in defending the continuation of the programmes, because the benefits exceed the costs to them. These groups will also have the greatest incentive and capability to organise effective political action, leading to what is known as political mobilisation bias, where the government would respond to the interests of small but homogenous groups rather than to some vague wide general interest. Responses seen in previous cases of subsidy reform have involved a variety of negative reactions, ranging from industry threats of loss of international competitiveness and of jobs, to mass popular protests against governments in place – for example in Nigeria, Indonesia, Malaysia, and Bolivia in the past ten years. Many governments' adverseness to tackling subsidy reform hence also results from a lack of relevant, positive examples elsewhere, and concerns over political consequences.

In a recent report we prepared for the UNDP (*Energy Subsidies in the Arab World*), we observed all these factors. One of the main lessons from the past year has been a tendency to delay – in some cases indefinitely – previously planned pricing reform as a result of last year's political uprisings that shook many parts of the region. However, in the Middle East as elsewhere in the world, many governments have increasingly found themselves in a financial position where the reform of energy subsidies is no longer a question of choice. This has been particularly the case for net importers of energy, whose budgets have been increasingly unable to stem the mounting fiscal burden of energy

subsidies. The oil price rises of the 2000s, compared to relatively stable and low prices during the 1990s, has in many cases led to a sharp rise in import bills, which many developing countries are less and less able to stem.

Moreover, in many energy producing and exporting states, energy subsidies constitute one way of distributing oil and gas rents to their populations. While in these countries, popular perceptions of a

citizens' 'right' to low-cost energy seem to render reform even more difficult, we suggest that governments explore alternative ways to distribute rents more efficiently, for instance through universal cash transfers (as proposed by Paul Segal in his article on Mexico in this issue of Forum) or through targeted transfers. Both methods enable populations to participate in producing countries' energy wealth, but avoid many of the economic

distortions that subsidies entail. In an unusual step, one of the region's major producers of oil and gas, Iran decided to reform its domestic subsidy system comprehensively starting in December 2010. One of the most relevant questions at this stage is arguably what can be learned from such cases by other potential reformers – keeping in mind that there can be no one solution that fits all countries' circumstances. ■

Energy Subsidies – an OPEC Perspective

JOERG SPITZY argues that energy subsidies are still legitimate policy tools

Reasons for Providing Subsidies in General – subsidies as a common policy tool

Subsidies have a long history and have been used widely by almost every economy in various forms up to the present day. Sector-wise, they range from multi-billion(US)-dollar farming, fishing and energy subsidies to the trillions of dollars of subsidies that have been channelled into the bail-out of the global banking system since 2007. Usually, they are provided via direct transfers of funds, while there are also subsidies that come indirectly via forgone revenues, like tax incentives. Both forms have a real cash effect.

Then there is support that does not involve cash-related flows and should not, therefore, be classified as subsidies. This includes state guarantees for the cheaper funding of specific sectors, guarantees for financial instruments or selling energy resources in resource-well-endowed countries to the population at production cost. There is no public fund outflow involved and they do not burden the funds of an economy, but, nevertheless, they are usually supportive of socio-economic development. These forms of support hardly qualify as subsidies.

The main question, when providing subsidies, is whether it makes sense in socio-economic terms to invest funds to support a specific sector, the population or any other important area of concern. It should be noted that, according to the agreement of the Group of 20 (G20), the answer to this question should be treated as a sovereign decision. Usually, such a sovereign analysis tries to balance the

social and economic costs and benefits and, therefore, distinguishes between efficient and non-efficient subsidies – defining efficient subsidies as those that enhance socio-economic development, while non-efficient subsidies can harm such development, since the costs outweigh the benefits. A tool that is available to assess this is 'social cost-benefit analysis' (SCBA).

A brief overview shows that the global figure for subsidies is large. In 2010 an OECD Secretariat report on Agricultural Policies showed that support for the agricultural sector in the OECD stood at \$379 billion in 2008 and at \$384 bn in 2009. The majority of these subsidies, \$262 bn and \$252 bn respectively, were producer subsidies, despite the fact that food prices – to the benefit of producers – increased by more than 20 per cent between 2007 and 2010. At the same time, subsidies supporting the consumer increased too, by more than 20 percent, i.e. covering inflation in agricultural products. Subsidies used since 2007 to bail out the global banking system have been on a much larger scale, but they are extremely hard to define, because of the complexity of the bailout, and are estimated in terms of multi-trillion dollars in the USA alone. However, before moving on to the energy sector in greater detail, it has become obvious that sovereign states may have many reasons to believe that, through subsidies, socio-economic factors can be improved, whether this be in the wealthier OECD or poorer developing economies.

When it comes to energy subsidies and, particularly, consumer subsidies, resource-abundant countries in the

developing world use them widely to eradicate poverty and facilitate access to modern energy sources. Three billion people are denied access to electricity around the world and 2.7 billion rely on the traditional use of biomass for cooking, according to the latest figures from the International Energy Agency. Particularly for resource-abundant economies, providing energy subsidies to consumers could be a simple and relatively efficient way of improving conditions for their populations as a transitional process. While there might be a long way still to go to achieve the UN Millennium Development Goals (MDGs), consumer subsidies for energy sources have been used for a long time with a positive effect on the socio-economic development of many of these countries. Although some developing economies have started to phase out consumer subsidies for energy, with the next step of channelling some of these funds into a social welfare system that could compensate individuals better and is more specifically targeted than broadly distributed energy subsidies, this has turned out to be a very challenging task, as has been observed on many occasions in recent years.

The magnitude of the funds, which are aimed at eradicating poverty and improving socio-economic development through such consumer subsidies for energy in mainly the developing economies, is estimated by the IEA's price-gap analysis (PGA) at \$409 bn in 2010. Since these assumptions are applied mainly to developing economies, it is worth noting that producer and consumer subsidies in much wealthier OECD economies in

2010 have been estimated at an aggregate value of around \$45–75 bn per year over the period 2005–10, by the OECD.

It is also important to highlight the fact that the amount that has been raised through negative subsidies in OECD economies on fossil fuels is around twice the sum that, according to the IEA's PGA, has been used for consumer subsidies for energy. These negative subsidies obviously play a vital role in economic policy, particularly in the energy field. Based on energy demand, price and tax data published by the IEA, OPEC estimates that, between 2005 and 2010, around \$850 bn were raised annually by OECD countries through taxes on petroleum products, including taxes on goods and services and value-added taxes. This compares with an estimate of \$800 bn in the years between 2004 and 2009. These funds are then redistributed to other areas, in accordance with sovereign decisions in these countries. Based on IEA and OECD data, negative subsidies are the highest, in relative terms, for oil-related products, followed by natural gas and coal. In 2010, the average amount of tax on oil in OECD countries stood at \$51.1/barrel of oil equivalent; for gas, it was \$3.1/boe, and for coal, \$0.2/boe.

In addition to these comparisons, it should be said that the PGA-based estimate of fossil fuel consumer subsidies seems to overstate the figures significantly. This is discussed in the IEA, OPEC, OECD, World Bank joint report for the 2010 G-20 summit. First, producer prices in many resource-abundant economies are relatively low, and, therefore, these lower prices cannot be compared with the usually higher prices in importer countries, where prices are also diluted by taxes, i.e. negative subsidies, and administration, marketing and freight costs. Due to this lower level of cost, in many economies no extra funds are being used to provide the

population with these lower fossil fuel prices. However, when these producer price levels in resource-well-endowed economies are applied, then the amount of consumer subsidies is reduced significantly to around \$250 bn. Furthermore, the PGA does not accommodate any purchase power parity (ppp) adjustment, which, in many of these countries – even when taking into consideration an international reference price – would significantly reduce the amount of this subsidy calculation. Therefore, even by applying the base number for 2010 of \$409 bn, a ppp-based approach would lead to a much lower figure of around \$300 bn.

Furthermore, any link between the virtually assumed amount of fossil fuel consumer subsidies and the funds needed to reduce greenhouse gas emissions is misleading. First, many estimates of consumer subsidies for fossil fuels seem to be overstated and are, secondly, only a fraction of the quantity of negative subsidies that have been raised by OECD economies, and are also only a rather small amount, in contrast with the massive subsidies given to the financial services sector in recent years.

Comparison of the Amount of Subsidies per Energy Unit

When reviewing energy subsidies, it is always important to compare them on a per energy unit, instead of as a total amount, since fossil fuels account for the majority of energy resources provided. Figures show that the subsidies for fossil fuels are by far the lowest, when compared with other energy sources. Based on estimates provided by the Global Subsidies Initiative (GSI), the rates of subsidisation for non-fossil fuel energies are at relatively high levels, compared with fossil fuels and are provided mainly by OECD countries. These countries are currently responsible

for 83 per cent of the world's nuclear and renewable energy-based electricity generation, according to the US Department of Energy's Energy Information Administration, and two-thirds of its biofuel production. Based on GSI estimates, non-fossil fuel energy sources and biofuels are subsidised at an average rate that is significantly higher than that for fossil fuels. The per unit subsidies to nuclear and renewable energy are up to 11.6 US cents per kilowatt hour and 15.4¢/kWh respectively, compared with up to 0.7¢/kWh for fossil fuels. For transportation, biofuels receive a subsidy of 3.3 ¢/kWh, compared with 0.5 ¢/kWh for oil-related products (Table 1).

The findings on nuclear energy are of particular importance and probably become even more accentuated, when considering the long lasting effects of potential accidents and all the long-term challenges related to nuclear waste. The cost of the clean-up following the meltdown of the Fukushima accident, for example, has been estimated at around \$250 bn and this does not even consider the economic consequences of this tragic incident.

Distinguishing Efficient and Inefficient Energy Subsidies

Energy subsidies can be very supportive for particularly immature economies, but decisions about subsidies are a sovereign matter. However, with respect to the use of subsidies as a policy tool, it is important to distinguish between efficient and inefficient ones. This must also be considered according to the G20's mandate, when deciding upon phasing out fossil fuel subsidies over the medium term. The complex, but most useful tool for analysing this matter is social cost-benefit analysis (SCBA). Such an analysis can only be pursued by the sovereign

Table 1: Energy Production and Subsidies

Energy type	Energy produced (2009)	OECD share of production (2009)	Subsidies per energy unit US cents/K Wh (2009)
Nuclear energy	2,600 TWh electricity	83%	0.5–11.6
Renewable energy (excluding hydropower)	500 TWh electricity	83%	1.7–15.4
Fossil fuels to electricity	12,900 TWh electricity		0.1–0.7
Biofuels to transport	51 Mtoe	66%	3.3
Oil products to transport	2,205,570 Ktoe		0.5

Sources: Global Subsidies Initiative and US Energy Information Administration

authority, since it is the only institution that holds all the necessary information for providing a comprehensive answer. An example of how this can be used to examine the social, economic and environmental impact of energy subsidies is provided in Figure 1.

While, for the poorer resource-well-endowed countries, such an analysis could probably support the reasoning for the provision of consumer subsidies for fossil-fuel related energy, most developed economies have concluded that it supports nuclear and alternative energy, i.e. those areas where they sense a comparative advantage, when it comes to the energy agenda.

Economic Impact, when Phasing out Energy Subsidies

As has been mentioned already, the challenges for phasing out energy subsidies are significant and many recent cases have highlighted the economic sensitivity of such reduced support. This seems obvious, when taking into account the severe economic impact this could have on these developing economies, where the majority of the population is considered to be relatively poor. Modelled simulations of the economic consequences of such a policy for OPEC's Member Countries

have shown a notable negative impact in the short-to-medium term, particularly when taking into account that, in many of these countries, the low prices of fossil fuels reflect the lower costs of production and that price increases would artificially burden, in many cases, populations that are already relatively poor.

These simulations were pursued with the Oxford Global Macro Model and analysed a phase-out of fossil fuel subsidies that was gradual and spread equally over five years. Furthermore, it was assumed that 60 per cent of the value of the fuel subsidy would be recycled back into the economy through government transfers, while the rest would be used to reduce budget imbalances. The actual level of expenditure on fossil fuels was estimated, using IEA data for 2009, on average subsidy rates as a proportion of the full cost of supply. Three main dimensions were analysed: the repercussions on GDP growth, the impact on inflation and the effects on the labour market.

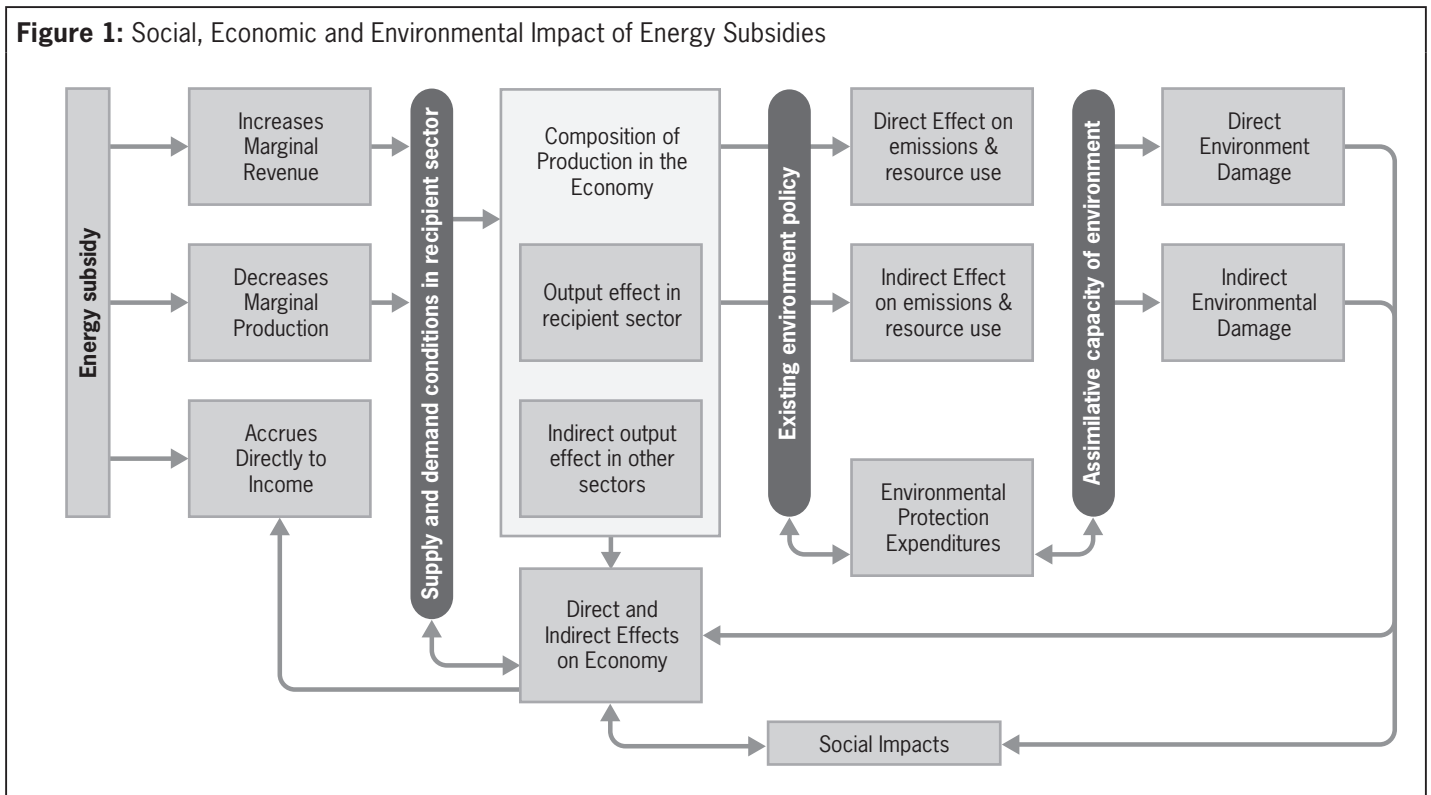
- The analysis showed that, when phasing-out energy subsidies, the GDP effect on Member Countries would be an annual average of -3.4 percentage points for the first five years.

- The negative GDP effect for Member Countries in this scenario is triggered primarily by a significant increase in inflation, which negatively affects the competitiveness of the manufacturing sector as it lifts input prices for the non-oil sector and puts pressure on real income and consumption levels. The average consumer price index for Member Countries will rise by 4.4 percentage points, compared with the baseline assumptions.

- A major impact of this would be a significant loss of jobs. Employment would decline by 2.3 percentage points, compared with the baseline assumptions.

It is obvious that any call for increasing prices on fossil fuels in resource-abundant developing economies would significantly hurt these economies. This is even more the case, when considering that inflation in most of the potentially affected economies has risen significantly already in recent years and that any measure that increases the pressure on households can hardly be justified. This sensitivity is also supported by the findings of the World Bank's Poverty and Social Impact Analysis (PSIA), which has shown that the proportional impact of subsidy removal

Figure 1: Social, Economic and Environmental Impact of Energy Subsidies



Source: United Nations Environment Programme, 2003, Energy Subsidies – Lessons Learned in Assessing their Impact and Designing Policy Reforms, p29

(or price-increase) can be the greatest for the poor, even in those cases where the rich receive more.

Conclusion and Key Take-aways

The findings illustrate some of the challenges and sensitivities involved in phasing out energy subsidies and highlight the low levels of subsidies that are being used for fossil fuels, compared with non-fossil fuels. Furthermore, it is important to consider any decision on subsidies as being a sovereign matter, as well as the importance of the sovereign authority distinguishing

between efficient and non-efficient energy subsidies. This can be pursued via a social cost-benefit analysis. The price-gap approach cannot provide this information, but instead supplies only a total amount that is potentially misleading, since it is not only impossible to distinguish between efficient and inefficient energy subsidies by means of the PGA, but it also treats lower production costs as subsidised prices and does not even adjust for purchase power parity assumptions.

Phasing out consumer subsidies for fossil fuels in many resource-abundant economies simply means raising prices.

Those countries that decide to phase out subsidies may face challenges in implementing reforms, and the reforms may lead to some restructuring of the economy that will need to be managed carefully. Therefore, any reform has to be designed with great care and will require considerable time. In conclusion, it seems sensible to recall that these fossil fuel consumer subsidies are addressing the vital needs of the poorest people on the globe. No one-size-fits-all model exists. ■

This text has been provided on behalf of the OPEC Secretariat.

Getting rid of Fossil-fuel Subsidies is a Triple-win Solution

FATIH BIROL calls for the removal of fossil fuel subsidies

Fossil-fuel subsidies remain commonplace in many countries. They result in an economically inefficient allocation of resources and market distortions, while often failing to meet their intended objectives. Moreover, volatile energy markets and the prospect of higher fossil fuel prices mean that fossil-fuel subsidies threaten to be a growing liability to state budgets. This prospect has created a strong impetus for reform, strengthened by other associated benefits. But fossil-fuel subsidy reform is notoriously difficult as the short-term costs imposed on certain groups of society can be very burdensome and induce fierce opposition. If removing these subsidies were

easy, it would probably already have happened.

Fossil-fuel Subsidies have Unintended Consequences

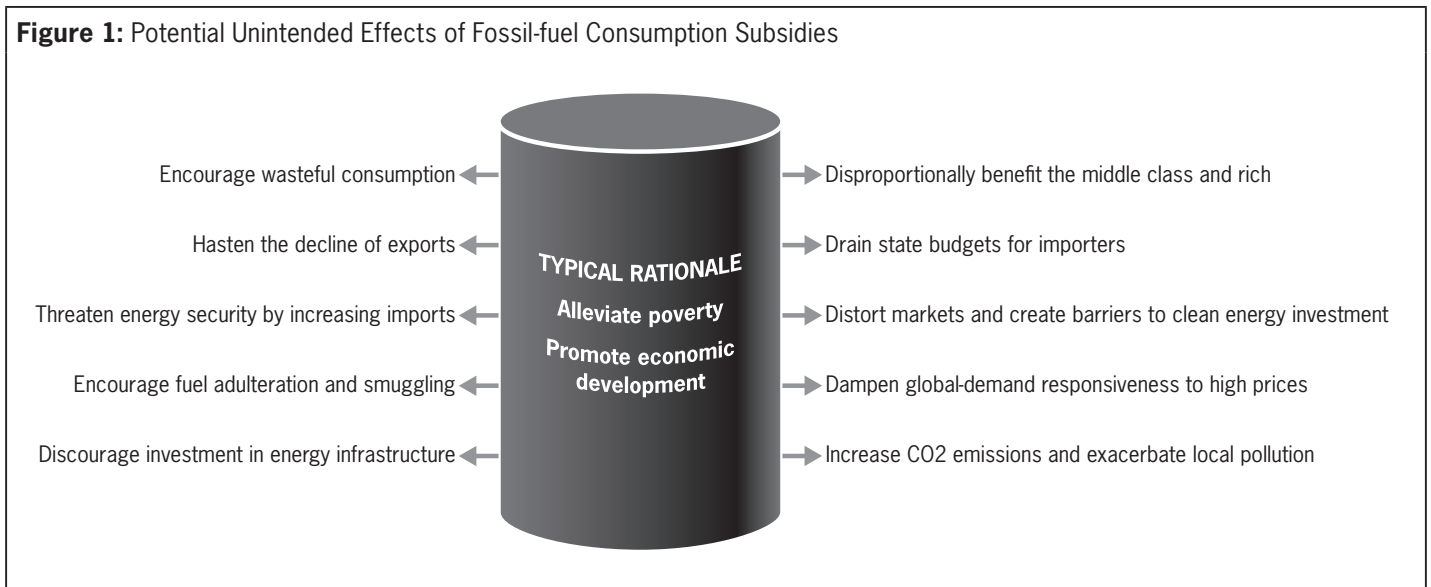
The most common justifications for fossil-fuel subsidies include alleviating energy poverty, redistributing national resource wealth, or promoting economic development and diversification (Figure 1). In recent years there has been growing momentum to phase out fossil-fuel subsidies as many were seen to be failing to serve effectively the aforementioned objectives. While also, in a period of persistently high prices, imposing unsupportable financial

burdens on countries importing energy at world prices and selling it domestically at lower, regulated prices.

A related motivation for phasing out fossil-fuel subsidies stems from their adverse impact on investment resources. Where fossil-fuel consumption is subsidised through consumer price controls, the effect, in the absence of offsetting compensation payments to companies, is to reduce energy companies' revenues, which discourage investments in energy infrastructure. This problem is particularly prevalent within the electricity sector of many developing countries, but also exists in the oil, natural gas and coal sectors.

Subsidies can encourage wasteful

Figure 1: Potential Unintended Effects of Fossil-fuel Consumption Subsidies



Source: World Energy Outlook 2011

consumption, thereby leading to faster depletion of finite energy resources, and can also discourage rationalisation and efficiency improvements in energy-intensive industries. There is a strong empirical link between low energy prices and excessive consumption. Extremely high rates of electricity consumption in many developing economies such as in parts of the Middle East can be shown to derive from cheap electricity tariffs rather than solely from demography or economic growth. The resulting subsidy, in certain cases, has over-burdened government resources at the expense of social and economic expenditures.

Fossil-fuel subsidies exacerbate energy price-volatility on global markets by dampening normal demand responses to changes in international prices. For example, the first half of 2008 saw robust demand despite dramatic increases in crude oil prices. This has now been attributed in part to artificially low energy prices in many countries, which blunted market signals. A survey of 131 countries carried out by the International Monetary Fund (IMF) found that in 2008 around two-thirds of countries failed to fully pass through the sharp rise in international prices for gasoline and one-half failed to pass through the full increase in the cost of diesel. Cutting subsidies, by shifting the burden of high prices from government budgets to individual consumers, would lead to a much faster and stronger demand response to future changes in energy prices and free up government revenues for other urgent needs.

Fossil-fuel subsidies can encourage fuel adulteration, and the substitution of subsidised fuels for more expensive fuels. In some countries, subsidised kerosene intended for household cooking and lighting is diverted for unauthorised use as diesel fuel due to wide price differentials. Fuel smuggling can also arise, since an incentive is created to sell subsidised products in neighbouring countries where prices are unsubsidised and, therefore, higher. This has been an issue for years in many parts of the world, particularly in southeast Asia, Africa and the Middle East. The effect in subsidising countries is a substantial financial transfer to smugglers, while recipient countries experience losses from uncollected taxes and excise duties, due to reduced sales in the legitimate market. Removing subsidies would

eliminate incentives both to adulterate fuels and to smuggle them across borders.

Fossil-fuel subsidies are mostly counterproductive in reaching local and global environmental goals. Subsidised energy prices dampen incentives for consumers to use energy more efficiently, resulting in higher consumption and greenhouse-gas emissions than would otherwise occur. Furthermore, fossil-fuel subsidies undermine the development and commercialisation of renewable energy and other technologies that could become more economically attractive.

Fossil-fuel Subsidies and their Costs

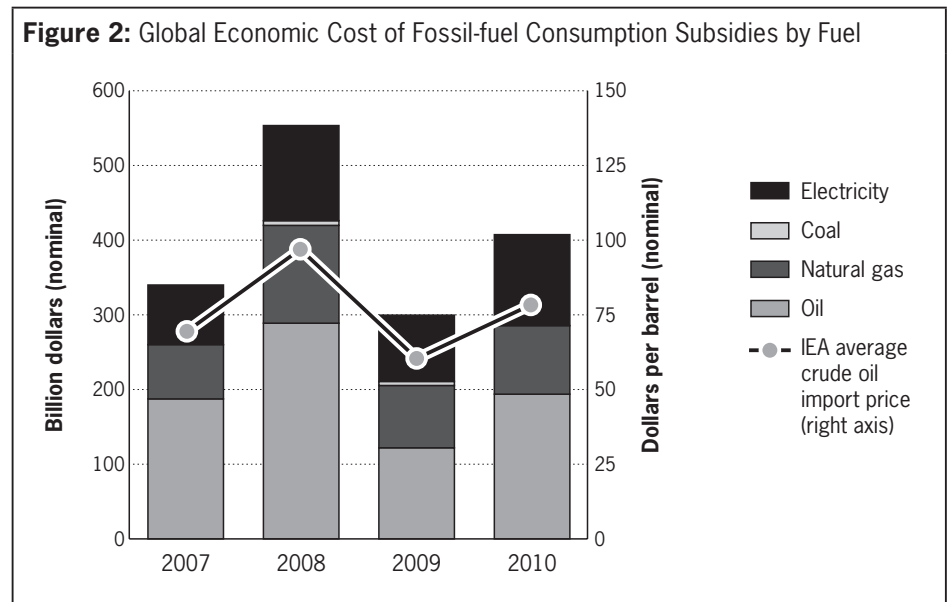
Within the framework of the World Energy Outlook (WEO), the IEA has been measuring fossil-fuel subsidies in a systematic and regular fashion for more than a decade. Its analysis is aimed at demonstrating the impact of fossil-fuel subsidy removal for energy markets, climate change and government budgets. The IEA's latest estimates indicate that fossil-fuel consumption subsidies worldwide amounted to \$409 billion in 2010, up from \$300 billion in 2009, with subsidies to oil products representing almost half of the total (Figure 2). The magnitude of energy subsidies fluctuates from year-to-year with changes in world prices, domestic pricing policy, exchange rates and demand. Of these factors, movements in world prices typically have by far the greatest impact on variations in

subsidy levels. The series of estimates from 2007 to 2010 demonstrate clearly the risk to which governments are exposed by regulated domestic prices in international energy markets subject to unpredictable price fluctuations.

Today, fossil-fuel subsidies remain most prevalent in the Middle East, amounting in 2010 to \$166 billion, or 41 percent of the global total. At \$81 billion, Iran's subsidies were the highest of any country, although this figure is expected to fall significantly in the coming years if the sweeping energy-pricing reforms that commenced in late 2010 are implemented successfully and prove durable. Two leading oil and gas exporters – Saudi Arabia and Russia – had the next-highest subsidies in 2010. While the magnitude of fossil-fuel subsidies in 2010 was also large in China and India, they are considerably smaller when viewed as a share of their economic output or relative to their huge populations, amounting to less than 0.5 percent of GDP and \$20 per person in both cases.

Fossil-fuel Subsidies are not Benefiting the Poor

One common justification for fossil-fuel subsidies is that they are needed to help the poor gain or maintain access to energy services essential to basic living standards. However the IEA's *WEO-2011* estimates that only 8 percent of the \$409 billion spent on fossil-fuel subsidies in 2010 was distributed to the poorest 20% of the



Source: World Energy Outlook 2011

population. (This finding does not include subsidies specifically provided to extend access to basic energy services.) Compared to other fuels, subsidies to kerosene tend to be best targeted on the poor, despite its tendency to be sold in the black market. In 2010, nearly 15 percent of the kerosene subsidies in the countries analysed reached the lowest income group; subsidies to LPG, gasoline and diesel benefited the poor least, with only 5–6 percent going to the lowest group. Subsidies to electricity and natural gas were in the middle of the range, with shares of 9 and 10 percent disbursed to the lowest group (Figure 3).

These results demonstrate that subsidising fossil fuels is an inefficient method of providing assistance to the poor. Fossil-fuel subsidies tend to be regressive disproportionately benefiting higher income groups that can afford higher levels of fuel consumption. Poor households may not have access to subsidised energy directly, lacking a connection to electricity or natural gas and owning no vehicle. The same level of financial support could be distributed more efficiently to low-income households at a lower cost. In general, social welfare programmes are a more effective and less distortionary way of helping the poor than energy subsidies.

Phase out Fossil-fuel Consumption Subsidies for a Healthy Energy Economy

Reforming inefficient energy subsidies would have a dramatic effect on supply and demand in global energy markets. The *WEO-2011* estimates that a universal phase-out of all fossil-fuel consumption subsidies by 2020 – ambitious though

it may be as an objective – would cut global primary energy demand by nearly 5 percent by 2035, compared with a baseline in which subsidies remain unchanged. Oil demand savings would be equal to 4.4 million barrels per day. Phasing out fossil-fuel consumption subsidies could represent an integral building block for tackling climate change: their complete removal would reduce carbon dioxide emissions by 5.8 percent, or 2 Gigatonnes, in 2020. Conversely without further subsidy reform, the IEA estimates that the total cost of fossil-fuel consumption subsidies would reach \$660 billion in 2020 (year-2010 dollars).

Curbing the growth in energy demand via subsidy reform has several important energy security implications. In net-importing countries, lower energy demand would reduce import dependence and thereby spending on imports. For net-exporting countries, removing subsidies would boost export availability and earnings. For all countries, it would also improve the competitiveness of renewable energy in relation to conventional fuels and technologies, further diversifying the energy mix. Lower energy demand would also alleviate upward pressure on international energy prices, while the elimination of subsidies would make consumers more responsive to price changes, which should contribute to less volatility in international energy markets.

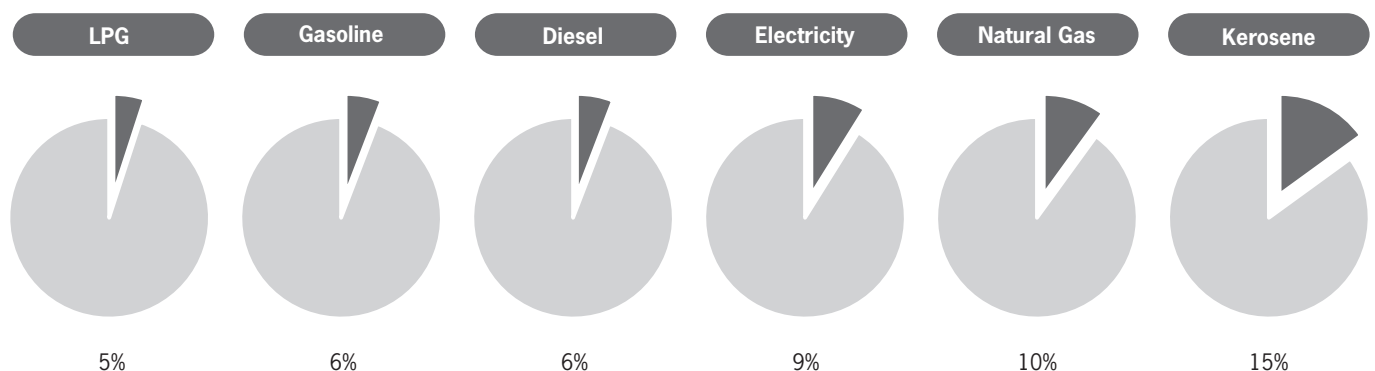
Signs of Progress but much more Remains to be Done

In September 2009, G-20 leaders, gathered at the Pittsburgh Summit, committed to ‘rationalize and phase out

over the medium term inefficient fossil fuel subsidies that encourage wasteful consumption’. In November 2009, APEC leaders meeting in Singapore made a similar pledge, thereby broadening the international commitment to reform. Since making these commitments, many G-20 and APEC member economies have publicly identified inefficient fossil-fuel consumption and production subsidies and outlined plans for their removal. Many other countries outside of the G20 and APEC groupings have also taken steps to bring their energy prices in line with international levels. In total, of the 37 economies identified in the *WEO-2011* global survey as having fossil-fuel consumption subsidies, at least 15 have either implemented reforms or announced related plans since the beginning of 2010. This includes a number of energy-rich exporting countries that have moved to phase out subsidies, or expressed interest in doing so, concerned not only by the high cost of the subsidies but also the resulting low efficiency in domestic energy use: the consequences can be sharp domestic demand growth and reduced availabilities for export.

While the above-mentioned reforms represent an encouraging start, much work remains to be done in order to realise the full extent of benefits from subsidy reform. And in this period of persistently high energy prices and with growing concerns about climate change and mounting risks to energy security, it is imperative that countries now follow through on their commitments by implementing subsidy reforms that are well-designed and durable. ■

Figure 3: Share of Fossil-fuel Subsidies Received by the Lowest 20 Percent Income Group by Fuel, 2010



Source: *World Energy Outlook 2010*

Note: Countries surveyed were Angola, Bangladesh, China, India, Indonesia, Pakistan, Philippines, South Africa, Sri Lanka, Thailand and Vietnam.

Oil Subsidies in Mexico

PAUL SEGAL argues that oil subsidies in Mexico are both extremely popular and wholly unjustifiable

The popularity of oil subsidies arises from a very natural sense of oil nationalism, which developed in many producer countries over the twentieth century through painful struggles with international oil companies. Mexico was at the leading edge of the wave, in 1938 becoming one of the first countries in the world to nationalise its oil industry. While the 1917 constitution had already declared that subsoil resources belonged to the nation, this proposition was never fully accepted by the international oil companies that extracted the oil: nationalisation was the result of their refusal to respect domestic laws and institutions, and the corollary of this difficult experience was the constitutional amendment of 1960 that banned concessions. Since then, the national oil company Pemex has been the sole producer of Mexican oil.

Given this history – shared in several important respects with many oil producers – it is no surprise that Mexicans have a strong sense of ownership of their oil. While references to ‘oil nationalism’ are often disparaging, its first and most important meaning is this legitimate concern for self-determination. The view

that oil should be cheap in those countries that produce it seems to follow naturally from this sense of ownership. But this is unfortunate because, as I will show, oil subsidies are both inefficient and inequitable, and do not properly express the right to the benefits of the oil that citizens can legitimately claim.

“The popularity of oil subsidies arises from a very natural sense of oil nationalism.”

Mexico is a major producer of oil, but it is also a large economy. Oil revenues have comprised between 7 percent and 10.5 percent of Mexico’s gross domestic product (GDP) in recent years. (For brevity I use ‘oil revenues’ in Mexico to refer to hydrocarbon revenues more generally, which are dominated by oil.) The Mexican economy is therefore not as dependent on oil as the major exporters of the Middle East, where oil production is worth more

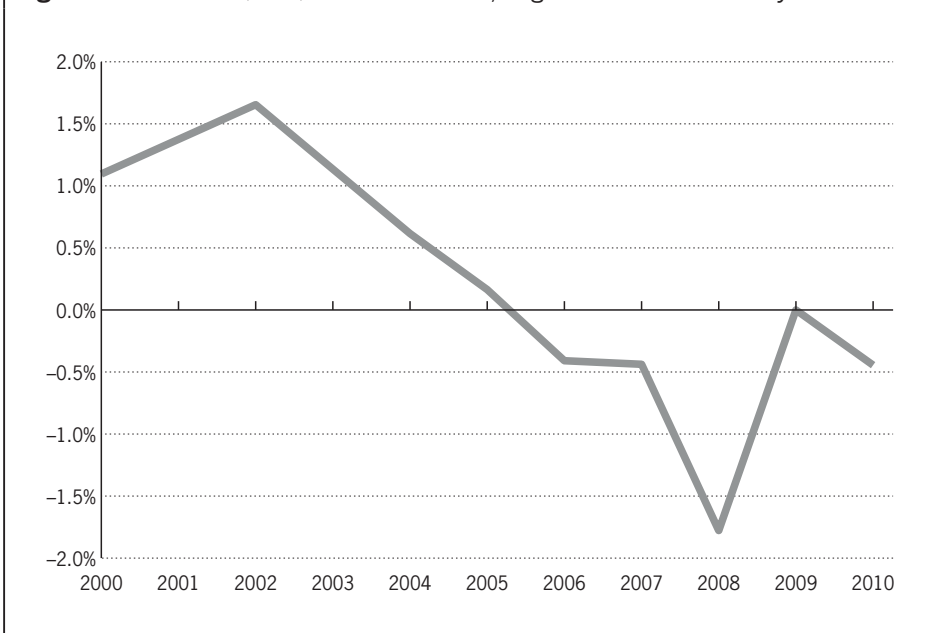
than the non-oil economy, or Venezuela, where it comprises up to a third of GDP. But oil provides 30 to 40 percent of Mexican government revenues. For this reason it is highly significant.

The cost of petrol within Mexico is set by the government using an implicit tax known as IEPS (Impuesto especial de productos y servicios), which includes a mechanism for smoothing the domestic price relative to changes in the international price. I describe the tax as ‘implicit’ because the government is the sole vendor of petrol so it receives the entire net price of petrol sold. To the government’s credit, it estimates the opportunity cost and reports the difference between the price and this opportunity cost as the tax or subsidy. The petroleum component of IEPS as a share of GDP is shown in Figure 1. It was indeed a tax up until 2005, in which year it was worth 0.2 percent of GDP in revenues to the government. But with rising oil prices it had already fallen from its peak of 1.7 percent of GDP in 2002, and by 2006 it had become negative, i.e. a subsidy, of 0.4 percent of GDP. In 2008, when oil prices reached a peak, it cost the government 1.8 percent of GDP. The subsidy disappeared in 2009 when international oil prices fell, but they reappeared in 2010 as these prices recovered.

This ‘cost’ to the government is not, of course, the same thing as the cost to the country, because that 1.8 percent of GDP was effectively being handed back to citizens. But such subsidies do imply a cost to the country, because they are inefficient. This is easy to see if one considers the simple experiment of exchanging \$1 of fuel subsidy for a cash benefit of \$1. With the cash benefit the recipient can choose to spend the \$1 on fuel, in which case she is in the same position as with the subsidy. But she can also choose to spend some share of the \$1 on something else. The fuel subsidy implies forced expenditure on fuel as opposed to on other goods and services that might be preferred. The result is over-consumption of fuel relative to other products.

Fuel subsidies are also regressive because richer people tend to spend a

Figure 1: Petrol Tax (IEPS) as Share of GDP; negative indicates subsidy



Source: Secretaría de Hacienda y Crédito Público (SHCP), <http://www.shcp.gob.mx/>

higher share of their incomes on fuel, largely because richer people are more likely to own cars. Mexico in 2006 was no exception. Table 1 presents government estimates of the distributional incidence of fuel subsidies, in particular the extent to which each decline of the population benefits: in 2006, more than 70 percent of the benefits of fuel subsidies went to the top 30 percent of the population. Surprisingly, in 2008, when fuel subsidies grew massively, the estimates imply that their impact was much less regressive. They were still absolutely regressive in that the rich gained more from them than did the poor, with the richest 10 percent gaining over 10 times as much as the poorest 10 percent. But in relative terms, the picture is much less clear. In 2008 the bottom 10 percent received 1.7 percent of market income and 2.1 percent of the subsidy, while the top 10 percent received 46.1 percent of market income and 24.9 percent of the subsidy. So relative to income, the gain of the top 10 percent was smaller than the gain of the bottom 10 percent. This is unusual; so much so that one might legitimately doubt the accuracy of the estimates.

Despite the regressiveness of fuel subsidies – at least in absolute terms even if not relative to income – there remains a perception among some that they are an appropriate form of social assistance. For instance, a government newsletter (SHCP) at the beginning of 2010 justified the fuel subsidies of 2008 as ‘supporting those who have least, because it is they who suffer most from the effects of the international recessions,’ describing the subsidies as ‘part of a packet of counter-cyclical policies proposed by the Federal Executive to support the family economy against the global crisis.’ As we have seen, the view that fuel subsidies are a plausible mechanism for helping ‘those who have least’ is impossible to justify.

Perhaps even more oddly, the same newsletter insisted that, by keeping the price of gasoline and diesel below that in the USA, it ‘maintained, in this respect, a competitive position for the national productive apparatus.’ This is another common misperception: that cheap fuel, by subsidising domestic industry, makes that industry more ‘competitive’. Just as in the case of consumption, if you want to subsidise your industry a fuel subsidy is a highly inefficient way to do it: such a

Table 1: Benefit Incidence of Subsidies on Gasoline and Diesel due to IEPS: share of total benefit received by each decile

Decile	Share of total benefit received by decile	
	2006	2008
1	0.80%	2.10%
2	1.70%	3.80%
3	2.80%	5.00%
4	3.70%	6.80%
5	4.50%	8.50%
6	6.70%	9.20%
7	8.40%	11.30%
8	12.40%	12.20%
9	18.80%	16.10%
10	40.20%	24.90%
Total	100%	100%

Source: SHCP 2008 and 2010.

subsidy incentivises an inefficient reliance on fuel rather than other inputs, reducing overall value added.

Despite this, we know that oil subsidies are popular because we know how difficult it is for governments to remove them. The withdrawal of such subsidies has often met with violent popular resistance, sometimes including riots. In Bolivia, for instance, a World Bank/ UDAPE document concluded that ‘the elimination of hydrocarbons subsidies is one of the policies that has met with the fiercest opposition from society and is therefore avoided by the government, in view of the repercussions this may have on the population and productive sectors.’ A recent attempt by the government of Evo Morales to reduce subsidies in Bolivia ended in failure, the policy withdrawn in the face of widespread protests.

If fuel subsidies are both inefficient and inequitable, how can a government go about reducing and removing them? Part of the problem is that, in addition to a legitimate sense of ownership of their oil, Mexican citizens, like those of many oil producers, are somewhat suspicious of the benefits they receive from the government. So appeals to the fact that removing fuel subsidies will enable a rise in government expenditures, or a reduction in taxes, do not immediately convince. Too often such an appeal is met by the response that, if

the money is not spent on subsidies, it will disappear into the pockets of government officials, or down the black hole of government inefficiency.

What is needed, therefore, is a strategy that convinces citizens that the fiscal savings will benefit them. The challenge is particularly keen when oil prices rise. Such a rise necessarily makes an oil-exporting country richer. But when the only direct sign that citizens see is a corresponding rise in fuel prices, with no obvious translation into benefits for them, then the call for subsidies is understandable. One possible solution is a ‘resource dividend’, that is for hydrocarbon revenues to be given directly to citizens as an unconditional cash transfer. Such a policy would be both highly progressive and poverty-reducing, as well as efficient. Since the dividend would rise when oil prices rise, citizens would feel the benefit of higher oil revenues. Other taxes would have to rise to compensate for lost government revenues, and in this respect the fiscal system of oil producers would come to look more like that of a non-oil-rich country – which would be no bad thing.

Alaska’s Permanent Fund Dividend is closely related, as is Bolivia’s Renta Dignidad, a universal pension for the over-60s paid for with hydrocarbon revenues – which, pre-dating the proposed reduction in subsidies mentioned above, could not be presented as a quid pro quo for their elimination. But perhaps the most interesting recent development on this front is in Iran. On 20 December 2010 the Iranian government cut fuel and other subsidies, with petrol prices nearly quadrupling to 38 US cents per litre. Households were given a one-off cash payment of about US\$80 each, and since then all Iranians living in the country have been entitled to, and nearly all receive, a monthly cash transfer worth about \$45 per person from the government. These unconditional transfers are officially known as ‘cash subsidies’, presumably to cement the perception that they are a replacement for the lost fuel and other subsidies.

Mexico, like many oil producers, needs a way to wean itself off inefficient and inequitable fuel subsidies. Policies that enable Mexican citizens to see the benefits of their oil independently of the fuel prices that they pay may help to reduce the political pressure behind such subsidies. ■

Energy Subsidies in India: Proactive versus Reactive Change

ANUPAMA SEN says energy price reform in India is work in progress

In June 2010, the Indian government deregulated the retail prices of petrol. Shortly afterwards, the 'administered' price of gas was raised to double its previous level. The prices of 'sensitive' petroleum products – diesel, kerosene and LPG, have also progressively been increased; petrol prices rose by roughly 33 percent between June 2010 and November 2011, while diesel rose by just under 2 percent. Simultaneously, measures also began to be put in place to reform the method of meeting distributional objectives in energy, by way of direct provision or transfer of subsidy amounts to consumers. As energy in India has historically been priced very low, these changes reflect a transition in the energy sector, which is arguably part of a wider movement of the economy, from a system of central planning and quantitative allocation, to one based on market principles.

Energy subsidies in India are extraordinarily complex to analyse. Broadly, they operate at two levels: the first is the 'macro' or economy level, where subsidies were initially intended to fulfil the distributional objectives of economic development, but which have ironically led to problems of exclusion and inequality of access. The second is the 'micro' or sector level, where subsidies were used for low priced intermediate inputs for 'priority' industry sectors, but which have caused inefficiency, and in some sectors such as electricity, the bankruptcy of state-owned companies. Across both these levels, the method of delivering subsidies to low income consumers has led to rent seeking and entrenched corruption.

The Macro Level

India has been growing at a rate averaging 8 percent per year; GDP in 2009 (at 2004 prices) was US\$ 977 billion (or US\$ 2643 in PPP terms); per capita income in 2009 was US\$ 1984 in PPP terms. Yet, 70 percent of Indians still live in rural areas and 37 percent of the population live below the poverty line. Although India consumes a large amount of energy in absolute terms, access remains very poor;

three fourths of the rural population depend on non-commercial energy for their needs, and about a quarter of the population (roughly 300 million) lack access to electricity entirely. India's population in 2011 was 1.2 billion. Energy use per US\$ 1000 of GDP was 195.4 kgoe in 2010, while energy use per capita was 585 kgoe.

In 2010, total primary energy use in India was 524 mtoe, of which coal comprised roughly 53 percent, oil roughly 30 percent, natural gas 11 percent, and other energy sources 6 percent. Of the three main primary energy sources, coal lies in the public sector, and is produced, priced and sold according to allocations made by the government. Natural gas is produced by public and private companies, and priced according to one of three fiscal regimes for hydrocarbon production that operate in the country; hence, in 2010, 33 percent of gas was priced through the Administered Price Mechanism (or 'APM'), roughly 40 percent at prices determined on production sharing contracts through a formula with bounded linkages to Brent, and the remainder comprised LNG imports. Gas produced within India is first allocated or rationed by the government at these different prices to 'priority sectors' (power, fertiliser and city gas) and then released to others. Seventy percent of oil is imported – the oil import bill in 2010 was nearly 7 percent of GDP – and until recently, oil imported at international prices was sold as refined products in the Indian market through public sector Oil Marketing Companies at subsidised prices.

The primary rationale for energy subsidies in India has been to keep the prices of energy low within the domestic economy, and, to a lesser extent, to influence consumption. Price controls and subsidies became explicit government policy in the mid 1970s, after the spike in international oil prices. Prices were kept low through a subsidy to large consumers ('priority' sectors) buying energy as an intermediate input (input subsidies) and also, through a simultaneous subsidy to consumers buying the final product (output subsidy). Thus, petrol, diesel, kerosene and LPG were subsidised, as well

as natural gas, which was supplied to the power and fertiliser sectors. This system was implemented without much difficulty as both the producing and the consuming sectors were run primarily by state-owned companies. In addition, subsidised kerosene, used for lighting and cooking by low-income households was distributed through the Public Distribution System, wherein the government supplied retailers with a predetermined quantity which eligible consumers could purchase using Ration Cards.

Although the system succeeded in keeping the domestic prices of energy low, it has come at an immense cost to the economy and has predictably succumbed to the unintended consequences of energy subsidies. First, there are enormous leakages. Between 40–60 percent of subsidised kerosene is illegally diverted to the market to arbitrage the price difference between subsidised supply and market supply. Second, subsidies have been regressive and have failed to address the divide between the rural and urban poor in India. Whilst a shift in consumption away from kerosene to LPG is seen with higher incomes in urban areas, in rural areas, the poorest income deciles continue to alternate between kerosene and firewood, depending on whichever is cheaper and easily accessible. Ration Cards require a permanent address and have thus excluded a large section of the low-income informal sector. Third, the method of financing subsidies has led to a mounting burden on the government budget and finances of public sector companies.

Energy subsidies in India are very difficult to quantify. Although they were initially borne directly on the government budget, as they increased, the burden was shared with state-owned oil exploration companies (that sold crude to the marketing companies at a discount, as well as transferred part of their profits from production to the marketing companies) and marketing companies (that sold refined products at prices lower than the costs of supply, taking on the difference as an 'under-recovery'). Additionally, the government issued 'oil bonds' to marketing companies that could be traded

Table 1: Energy Subsidies in India

			2010
Average Subsidisation rate			13.5%
Subsidy (US\$/person)			18.2
Total Subsidy as Share of GDP			1.4%
Subsidy by Fuel (US\$ Bn)	2008	2009	2010
Coal	0	0	0
Oil	32.1	11.5	16.2
Gas	4.2	2.7	2.2
Electricity	7.8	6.2	3.9

Source: International Energy Agency (based on difference between domestic and world prices)

on the markets, in order to compensate them for some of these under-recoveries. As oil bonds did not count towards the Statutory Liquidity Ratio for banks and other financial institutions, the market for bonds became saturated very quickly, worsening the financial position of these companies. In an effort to cope with this, the government in 2008 cut federal taxes on petroleum products whilst keeping the retail price unchanged. This had a limited effect, as under the system of fiscal federalism, state taxes (VAT) are levied separately by states, ranging up to 20 percent, and representing a major portion of states' revenues.

In May 2011, energy subsidies were estimated (based on the difference between domestic and international prices) to have reached around 3 percent of GDP. Given what has been shown by the UN Environment Programme about other subsidy programmes on this scale, we should expect that this has led to considerable economic distortions, constraints on fiscal policy and even headwinds on economic development.

The Micro Level

Looking at subsidies from a sector or 'micro' level, they are endogenous to policy objectives in downstream energy consuming sectors; consequently, the

strongest resistance to their reduction or removal has tended to come from these sectors. As an example, consider the case of natural gas in the fertiliser sector (which is state-owned), which in 2011 consumed roughly a quarter of gas produced by the NOCs (also called 'APM gas'), primarily for the manufacture of urea, a fertiliser product that is used to treat crops along with phosphates and potash in the optimal ratio 4:2:1. The policy objective for the fertilisers sector is to attain 'self sufficiency' in manufacturing and it is allocated subsidised gas for this purpose. Additionally, a subsidy is provided on roughly 50 percent of the retail price of urea to the end consumer (the farmer). Studies show that this has led to an over-use of urea where the ratio used for treating crops has risen to 7:2:1. Consequently, shortages have occurred in the production of urea. This feeds back into the cycle, as to meet these shortages the Ministry of Fertilisers generally chooses the cheapest out of three options for the production of urea: using domestic subsidised gas, importing LNG on spot markets, or importing urea on the international market. Of these, the first option is almost always the cheapest. This further distorts demand signals, both for fertiliser and natural gas. Studies also show that this system of subsidy

provision has excluded small farmers as an unintended consequence. In many ways, this argument can be extended to other energy consuming sectors for other fuels used as intermediate inputs, suggesting a system of interlinking distortions.

A Fragile Transition, in Progress

The literature on subsidy reform suggests that a good way of setting about correcting such distortions is to end the input subsidy and provide a direct output subsidy in the short term, and to eventually eliminate, or, if there is a strong case for the distributional objective, replace the output subsidy with a direct transfer to the eligible low-income consumer in the long term. The first step primarily involves raising prices, and the second involves reforming the method of delivering the subsidy or transfer such that only eligible recipients benefit from them. In India, where rapid economic growth has had little impact on poverty, there exists a strong case for direct transfers. The creation of distortionary linkages between energy producing and consuming sectors through the provision of input *and* output subsidies suggests that subsidy reform is required not just in energy, but also in sectors such as fertilisers. As stated earlier, changes began to be made towards this in 2010. There are three main policy

Table 2: Retail Prices of Fuel in Delhi

'Desired' Price	Price Before Excise & VAT	Retail Selling Price	2010
Petrol (US\$/litre)	–	0.82	1.40
Diesel (US\$/litre)	0.91	0.28	0.32
Kerosene(US\$/litre)	0.95	0.71	0.87
LPG (US\$/14.2kg cylinder)	16.53	7.97	8.52

Source: Petroleum Planning and Analysis Cell, Government of India (2012); subsidy is applied between Desired Price and Price before Taxes

measures in progress. First, the 2010 federal Budget replaced the input subsidy in petroleum products and gas, with a direct subsidy to marketing companies at the point of sale. The 2011 Budget contained an identical policy measure for the fertiliser subsidy. Second, a new system of social security, the 'Unique Identification Number', began to be put in place, which aims to provide every Indian citizen with a unique number upon the collection of his or her biometric data, through which all direct transfers will be made in the future. This system attempts to overcome problems such as the exclusion of informal sector workers by requiring only nationality to be proved, and by linking it to informal sector work programmes such as the National Rural Employment Guarantee. Although an immense exercise that is

likely to be susceptible to problems, it may reduce leakages from the illegal duplication of identity. The system was trialled in 2011, and was scheduled for launch in March 2012. It has, inevitably, run into delays. Finally, a significant reform in taxation, the Direct Tax Code, was due to come into force during 2012. This includes a Goods and Services Tax, which will allow for a unified market, whilst maintaining the fiscal autonomy of states. This could further influence fiscal policy in relation to energy subsidies, but it is as of now unclear how the energy sector will be affected.

As before, it can be argued that recent reform measures are part of a wider transition in the Indian economy. During this transition, as distortions mount, parts of the system are modified, usually

in the broad direction of liberalisation and reform. But partial reform often has the effect of displacing the problems, for example from upstream to the consuming sectors, presenting new policy challenges, requiring further changes. The current situation is, arguably, a stage on the way. Although there is reason to be optimistic, it is a fragile transition. Indian policy-makers currently face rising international oil prices, a depreciating Rupee, a potential slowing of GDP growth (estimated to be down to 7 percent for 2011) and growing public discontent. With the recent defeat of the ruling Congress Party in State Assembly elections, and a General Election fast approaching in 2014, the longevity of these reform measures is likely to be severely tested in the next couple of years. ■

Pricing Reforms and Capacity Constraints in China's Petrochemical Sector

DAMIAN TOBIN assesses the impact of China's changed energy pricing system on its downstream sector

As an economy where the state continues to exercise control over the procurement of a wide range of goods and services, China offers a fascinating example of how economic necessity, mostly as a result of rapid growth in manufacturing, has forced the state to abandon the large-scale subsidisation of petrochemical products.

Recent data from the IEA show that China's subsidisation of oil is among the lowest of developing nations, having fallen from US\$ 27 billion in 2007 to just US\$ 7.77 billion in 2010. The withdrawal of subsidies has had a dramatic effect on state-owned refiners, who had long benefited from a complex system of price subsidies for crude oil inputs and tariffs and quotas on imported petrochemical products. Their withdrawal has meant that the crude oil purchased by China's refineries is now priced close to the international price, but the retention of state control over oil and petrochemical product prices has meant that it is often state-owned refiners who are forced to absorb the costs of this adjustment. The result is that China's refineries have faced market prices long before a refining infrastructure appropriate for the needs

of large-scale oil refining could be put in place. The following describes how the early removal of subsidies offered a powerful incentive for enterprise reform; but how it has also hindered the ability of refineries to overcome longstanding capacity and production constraints.

China's Petrochemical Sector

In theory the gradual phasing out of state price subsidies and the benchmarking of production against international prices alongside the reduction of tariffs in product markets should have enabled China's petrochemical sector to improve its efficiency. Indeed over the past decade China has achieved a remarkable increase in refining capacity. Its aggregate refining capacity increased from 5407 thousand barrels daily or 6.5 percent of global refining capacity in 2000, to 10,121 thousand barrels daily or 11 percent of global refining capacity. China is now second only to the USA in terms of global refining capacity. China's position is such that it is now the principal driver of increases in global refining capacity. Of the 0.7 million barrels per day increase in global refining capacity in 2010, 91 percent

(or 0.642 million barrels per day) was accounted for by China. What is surprising is that despite the impressive capacity increases, China's refining infrastructure continues to appear poorly equipped to deal with large-scale oil refining. Foreign participation in the sector remains low and many domestic refineries are small in size, geographically dispersed and suffer from the historical problems of low and variable throughput levels.

China's growth has had two specific impacts on the petrochemical sector. First, the upstream or exploration part of the sector has no longer been able to fully supply the downstream or refining part. In 2010, in order to meet domestic demand China imported 4710 thousand barrels daily of crude oil, equivalent to 12.5 percent of global crude imports. China's largest refiner Sinopec could no longer expect to meet its crude oil demand through self-supply. In 2009, Sinopec imported some 75 percent of the crude oil for its refining business from international suppliers.

Secondly, difficulties in increasing refining capacity have meant that domestic capacity alone could no longer match demand. State-owned

refineries typically sought to increase capacity through acquiring refining capacity from their state-owned ministry level parent companies or by acquiring smaller production units. As demand increased, expanding capacity via internal acquisitions was no longer appropriate to meet market demand. By 2010, China imported 1253 thousand barrels daily of refined products, equivalent to 8.1 percent of global imports. These pressures led to an early erosion of the privileged status of petrochemicals as purchasers of subsidised crude oil and a subsequent opening of the sector to international markets.

Pricing Reforms

China's oil pricing policy has largely evolved in line with its increasing involvement in global manufacturing. Benchmarking the price of oil and gas to international prices became an economic necessity once China became a net importer of crude oil in 1993. The increasing demands of industry for petrochemical-based inputs alongside the failure of domestic state-owned oil companies to discover new oil supplies of sufficient quantity meant that the subsidising of refiners was no longer economically viable. This was to impact not just on the margins of refiners, but also and as a consequence, the extent to which they would be able to maintain and increase production throughputs.

Prior to 1993, petrochemical enterprises faced a three tier pricing system for crude oil requirements. This consisted of a price heavily subsidised by the state (a state low price), a less heavily subsidised price (a state high price), and an unsubsidised market price. For example, in 1992 the state low price for crude oil from *Daqing* and *Shengli* oilfields was RMB265 per ton, while the state high price for oil from *Daqing* and *Shengli* was RMB621 and RMB544 respectively. This compared with an average market price of RMB 1000 per ton. In 1993, the pricing system was reformed to reflect market conditions and all subsidised oil was charged at the state high price. This coincided with China's first year as a net importer of oil.

Up until 2001, crude oil prices were generally updated monthly on the basis of Singapore prices. For example, between November 1999 and August 2000, the state raised oil prices on six occasions in

an attempt to keep pace with international developments and support enterprise profitability. Such adjustment encouraged the hoarding of inventories as enterprises could easily predict future price movements. The decision in October 2001, to switch to the issuing of guidance prices based on prices in three international markets therefore represented an important shift in regulatory policy. Guidance prices are calculated on a transparent formula thereby allowing enterprises more certainty. Although the state still retained some control over prices, the new pricing structure was sufficiently flexible to allow enterprises price products according to the price of inputs. This has been particularly important since 1996 when under GATT domestic refiners faced increasing competition from imported petrochemical products. For China's petrochemical enterprises, this had the effect of reducing the tariffs on imported products in their product markets from a range of 9 percent to 40 percent, to a range of 5 percent to 22 percent. Under the WTO tariffs on imported ethylene, synthetic resins and fibres, and gasoline were scheduled to fall significantly after 2003, 2008, 2004, and 2001 respectively.

Under the current pricing mechanism in place since 2009, the National Development and Reform Commission (NDRC) can consider changing benchmark retail prices of oil products when the international crude price rises or falls by a daily average of 4 percent over 20 days. In theory this provides refineries with a credible and transparent pricing mechanism. In practice fuel prices remain a politically contentious issue and price adjustments can be more arbitrary with upward and downward adjustment delayed due to political considerations. It also means that the margins of refineries are still after more than 30 years of economic reform, ultimately dependent on government pricing policy. For example in 2000 it was reported that in Beijing, the local government started providing taxi drivers with 100 Yuan in subsidies a month to help defray rising fuel costs. In 2003, China delayed adjusting prices, as it was feared that higher fuel prices might hurt some of the country's more vulnerable industries as a result of the SARs crisis. In 2011, China raised prices for gasoline, jet fuel and diesel reflecting the rising global prices of these products. But the increases

were slower than the increase in the price of international crude. For petrochemical companies this meant that they were unable to pass on the full cost of price rises.

Capacity Constraints and Squeezed Margins

Although the early removal of subsidies forced refineries to benchmark their prices to international trends, it has not resolved the problems of low capacities and variable throughputs. If anything the current pricing structure has created the incentive for refineries to reduce throughputs and slow production in order to protect already slim profits margins. It also creates the political incentive for the state to pass on international price increases to refiners. The magnitude of this problem is succinctly illustrated in Table 1, which shows the primary distillation capacity of Sinopec's largest refineries. The shaded areas represent refineries that are regarded as meeting international capacity standards. Even those larger refineries that meet international minimum capacity standards continue to suffer from variable throughput levels. Low capacity utilisation of refineries has been a historical feature of China's petrochemical sector. Although the sector achieved considerable improvements following the international listings of refineries in the 1990s, there still appear considerable variations across individual refineries. For Sinopec, China's largest refiner, throughput as a percentage of primary distillation capacity declined from 85.8 percent in 2007 to 80.1 percent in 2009 even though overall yield increased from 93.9 to 94.5 percent over the same period.

The data in Table 1 indicate that although refineries have been successful in bringing on-stream new refining capacity, market conditions and in particular pressures on refining margins and profits, may mean that the historical problem of low capacity utilisation remains. Although large state enterprises in China's oil and gas sector continued to account for a large and increasing proportion of state enterprise profits (31 percent of all SOE profits in 2010 up from 19 percent in 2009), the same is not true for the downstream refining side. Enterprises involved in petroleum, coking and fuel procession account for about 7 percent of total SOE profits and have substantially lower

returns on assets and sales than those on the upstream side. Survey data from China's State Statistical Bureau for 2011 indicate that the oil refining, coking and nuclear-fuel processing, communications equipment and computer manufacturing sectors saw profits plunge 83.9 percent in the period January to September 2011. The suspicion is that the current pricing structure allows the state to delay adjusting prices and force refineries to absorb the cost of any change in international prices thereby further putting pressure on refining margins. Pressures on margins make it difficult to justify running

refineries at full capacity, particularly if it results in losses.

Going Forward

The removal of state subsidies and the reduction of tariffs on a wide range of petrochemical products have led to a remarkable and unusual opening up of China's state-driven petrochemical sector. But it has also created considerable uncertainties, particularly in terms of the future role of the state as both price regulator and owner as well as how it intends to create a modern refining infrastructure capable of supplying China's rapidly

growing industrial base. The removal of subsidies and the early opening up of the sector to imports has gone hand-in-hand with a dramatic expansion in capacity and improvements in efficiency. But it has also exposed refineries to volatile international prices without addressing the problems of small-scale and variable throughput. It also exposes refiners to political risk as the state retains the ability to force refiners to absorb increases in international prices. Addressing this will require important political compromises in a sector that has a long history as a strategic part of China's state-owned industrial base. ■

Table 1: Primary Distillation Capacity of Sinopec's refineries (Unit: Million barrels/year)

Refinery	1998	1999	2000	2004	2005	2006	2007	2009	Throughput as % primary capacity (2009)
Maoming	95.85	95.85	95.85	95.8	95.8	95.8	95.8	95.5	96.3
Zhenhai	67.45	85.2	85.2	142.0	142.0	142.0	142.0	169.69	80.3
Qilu	74.55	74.55	74.55	74.55	74.55	74.55	74.5	74.55	96.2
Yanshan	67.45	56.8	56.8	56.8	56.8	56.8	92.3	92.3	83.1
Guangzhou	54.67	54.67	54.67	54.67	54.67	93.72	93.7	93.72	84.8
Gaoqiao	51.83	51.83	51.83	78.1	78.1	78.1	78.1	78.1	95.5
Jinling	49.7	74.55	74.55	92.3	92.3	92.3	92.3	92.3	95.4
Tianjin	35.5	35.5	35.5	0	0	0	39.0	88.75	34.4
Yangzi	39.0	39.0	39.0	56.8	56.8	56.8	56.8	56.8	100.0
Shanghai	37.6	44.7	44.7	62.5	99.4	99.4	99.4	99.4	62.9
Changling	35.5	35.5	35.5	0	0	0	0	0	
Luovang	35.5	35.5	35.5	0	0	0	46.1	56.8	80.0
Jingmen	35.5	35.5	35.5	0	0	0	0	0	
Wuhan						0	35.5	56.8	56.3
Fujian						0	28.4	85.2	58.3
Hainan						0	56.8	56.8	102.5
Qingdao						0	0	71	90.0
Others	35.5	35.5	–	388.4	386.2	460.8	331.6	343.6	
Total	715.7	754.7	719.2	1101.9	1136.7	1250.3	1362.5	1611.7	

Notes: a) Converted using 7.1 barrels per tonne for Chinese Crude. All figures rounded to one decimal place. b) Refineries meeting the international capacity standard are highlighted. The international capacity standard is of the order of 10 million tons of crude per year equating to approximately 71 million barrels per year

Sources: Form 20-F Sinopec various years

Reforming Energy Subsidies: The Iran Model

HAMID TABATABAI traces the Iranian subsidy reform experience since 2010

A Radical Reform

Removing fuel subsidies is a tricky business. Many governments try and fail, often having to backtrack in the face of public protest or political opposition. Bolivia

and Nigeria are only the latest examples. Price increases do not have to be huge to provoke opposition. Iran had that experience a few years ago when a government-decreed 20 percent increase was rolled back after a year by a parliament

dominated by a rival political current. It is all the more remarkable, therefore, that in December 2010 Iran itself managed to put in place one of the most radical fuel subsidy reforms ever attempted anywhere and make it stick. Prices of various fuels

and related products (electricity, water, and so on) were raised not by a paltry percentage but several-fold, overnight, and all at the same time. And that was only the first round. A second round of increases is now around the corner, to be followed by yet more in due course until domestic prices are brought into line with international prices.

It is true that the starting prices were inordinately low. The country had had a cheap fuel policy for decades. In November 2010 just before the reform was launched, fuel prices in Iran were the lowest of any country in the world, except Venezuela. Petrol cost 10 US cents a litre and diesel fuel only 1.65 cents throughout the country. For many years, Iran's currency, the *rial*, has been subject to a managed floating exchange rate regime that kept it pegged to the US dollar at rates hovering around US\$1 = Rls10,000. An unusual turmoil in the foreign exchange market over the past few months has led to an official exchange rate of Rls12,260 and a free market rate nearer Rls20,000. For the sake of simplicity, the *rial* figures in this article are given in equivalent dollar terms using the exchange rate of Rls10,000 for figures referring to the start of the reform over a year ago, and Rls12,260 for current figures.

Gas, electricity and water too were exceedingly cheap, as were a few staple foods such as bread. The result was overconsumption, inefficient production, waste, pollution, smuggling to neighbouring countries and, not least, a lopsided distribution of benefits as the bulk of the subsidies went to the better-off sections of the population who consumed more. By official estimates, price subsidies in recent years had been costing some US\$100–120 billion annually – about 30 percent of the GDP – of which 70 percent went to only 30 percent of the population, mostly in urban areas. (It should be noted that the subsidies are mostly implicit, not financed by oil exports or the budget. They arise because domestically produced oil and gas – the sector is nationalised – are sold cheaply on the local market.)

The big idea behind the reform strategy was not to abolish price subsidies as such but to convert them into 'cash subsidies.' The objective was twofold: improving economic efficiency through rationalisation of subsidised prices, and reducing income disparities through cash transfers. These

were reflected in the main provisions of the Subsidy Reform Law of January 2010. The Law authorised the government to raise prices of fuel, electricity, water, transport and postal services as well as of some subsidised foods over the five-year period from March 2010 to March 2015. Domestic sale prices of petrol, diesel fuel, and other fuels are to be raised gradually to reach at least 90 percent of Persian Gulf FOB prices. For natural gas, domestic prices should eventually exceed 75 percent of average export price, and for electricity and water to cover their full cost price. In the cases of wheat, rice, cooking oil, milk, sugar, air and rail transport, and postal services arrangements are to be made for the gradual elimination of subsidies over the same five-year period.

“... in December 2010 Iran itself managed to put in place one of the most radical fuel subsidy reforms ever attempted anywhere”

The other side of the coin was the compensatory 'cash subsidies' to a nation of 75 million that had come to regard cheap fuel as a birthright. The Law authorised the government to spend up to 50 percent of the net proceeds from price rises for (i) cash and non-cash subsidies payable to all households nationwide, taking into consideration household income; and (ii) implementing a comprehensive social security system for the targeted population. Cash payments would be made through the banking system to the head of each household. The payments would be exempt from income tax. The Law also set aside 30 percent of the net proceeds to help producers adopt energy saving technologies, to compensate part of losses to companies and municipalities providing utility services, to develop and improve public transport, and to promote non-oil exports. The remaining 20 percent of the net proceeds would go to the government for improvements in infrastructure.

Implementation

Clear as the Law may appear to be, the government's actual implementation of it

differed significantly in some key respects. First, for reasons that I have more fully elaborated elsewhere, there was a nine-month delay in launching the reform, which was put off from March to December 2010. This long delay was justified by the government as being necessary to allow better preparation of implementation modalities. It did indeed serve that purpose too but the main motivation was to enable the government to implement the reform more in line with its own views than with those of the parliament, views that it had been unable to get incorporated into the Law. In particular, the delay made it possible to vastly accelerate the pace of reform, as the government desired all along and the parliament resisted.

Secondly, to the consternation of many, the initial price increases decreed by the government went far beyond levels widely presumed. The price of petrol for private cars went up from 10 to 40 cents a litre (an increase of 300 percent) for the first 60 litres of monthly consumption, and from 40 to 70 cents (75 percent) beyond that limit. Diesel fuel shot up from 1.65 cents to 15 cents a litre (800 percent) for purchases up to a certain amount depending on the vehicle concerned and to 35 cents (2000 percent) for more. Similar increases came into force at the same time for gas and other fuel products, electricity and water charges, and bread flour. This price shock took the country half the way towards targeted final prices overnight, instead of gradually over the first two to three years of the reform process as the parliament intended.

Thirdly, household income was not taken into account in the determination of entitlement to the cash subsidy. Every Iranian citizen residing in the country was declared eligible to receive the same amount of transfer. The cash payments to each household thus depended on its size, not its income, and would be paid to the head of the household on behalf of all its members. To claim it, each head of household had to fill out a routine form and provide a bank account into which the money could be deposited.

Finally, with a view to winning public support and cooperation, the monthly transfer amount was set at Rls455,000 (about \$45 at the time) per person, an amount that was way above what would have been consistent with the provisions of the Law. As a result, transfers to

households consumed 80 percent of the net proceeds from price hikes in the first year of the reform instead of 50 percent, leaving rather little for producers and the government. Put before a *fait accompli*, the parliament eventually went along and modified the original percentage shares of households, businesses and the government from 50-30-20 respectively to 80-20-0 for the new Iranian year starting on 20 March 2012. There was of course no question of antagonising the public by forcing a reduction of the transfer amount.

At the start of the reform, some 60 million people or 80 percent of the population were participating in the cash transfer programme. This went up to nearly 73 million or 96 percent of the population within a few months after the start of the programme, in part because of the dramatic extent of price increases and the correspondingly high level of cash subsidy.

Minor incidents apart, the reform process took off fairly smoothly. The most important factor was no doubt the cash subsidies, cleverly paid before the higher prices began to hit people's pockets. But an extensive public education campaign preceding the reform played an important role as well. It emphasised the wasteful aspects of the price subsidies and their inequity. It was endlessly repeated that subsidies were not being eliminated but transformed from a bad form – price subsidies on products – to a good form – cash subsidies for households. Reassuring messages emphasised that inflation would not get out of hand, that poverty would be substantially reduced, and that no-one would go to bed hungry anymore. Extra allocations of cheaper fuel were also made in the early months to smooth the transition to higher price fuel. Price controls were reinforced too to moderate ripple effects.

Early Results

The reform process was launched over a year ago and evidence is now beginning to surface on the results. Such evidence, although from official sources, is at times disputed by independent experts and observers, occasionally even by other official bodies. But the picture that emerges is likely to be valid in broad outline.

Inflation. The fear of runaway

inflation was the most controversial issue prior to the reform. The Central Bank figures now suggest that while the price shock accelerated inflationary pressures, the impact has fortunately not been as dire as had often been predicted by some analysts and parliamentarians. To take the most common indicator used in the country, the annual rate of urban inflation in the months preceding the reform was 9–10 percent. With the launch of the reform on 19 December 2010, this rate started climbing by about 1 percentage point a month to reach 20.6 percent in December 2011. The acceleration appears to have been entirely due to price reform. The relatively subdued impact on overall inflation – when subsidised prices had been raised several-fold – was due in part to price controls that were intensified when the reform was launched. Price controls have since been relaxed but not entirely withdrawn.

Consumption Pattern. One of the main objectives of the reform was to reduce excessive consumption of subsidised goods and services, notably of fuel. This seems to have been achieved, perhaps even to excess. Official data show substantial declines across the board. Between 2010 and 2011, the years before and after the reform, the average daily consumption of petrol fell from 62.8 million litres to 59.3, or 5.6 percent. The corresponding declines for diesel fuel are from 81 to 73 million litres (10 percent less), for liquid gas from 12.3 to 11 million litres (10.6 percent less), and for furnace oil from 18.1 to 11.5 million litres (36.5 percent less). The savings are all the more remarkable in view of past trends that witnessed growth of fuel consumption of the order of 10 percent a year. Fuel smuggling has also dropped sharply, although some still goes on given the continuing price differences across national borders. Electricity consumption fell by 8 percent, compared to an increase of 10 percent in the previous year. The consumption of wheat and bread flour plunged by over 22 percent, much of it presumably through reduction in wastage.

Production. Such huge drops in consumption had their mirror image in production (and imports), particularly in the small business sector. Caught between higher energy prices, lower consumer demand, and price controls, small businesses felt the pinch and many of them have found it hard to operate profitably

in the new environment. Hard evidence on impact on productive sectors is too limited to draw reliable conclusions at this stage and the government and its critics sharply differ in their assessments of the situation. What is clear though is that cash transfers tended to favour consumers more than the producers who did not get their envisaged share of 30 percent in the proceeds from subsidy cuts. And what they did get appears to have been mostly in the form of loan rather than grant.

Income Distribution. Another main objective of the reform was to reduce income disparities. The cuts in subsidies affect household incomes in proportion to their consumption of subsidised goods and services. While some basic foods were among them, the cuts overwhelmingly concerned energy products whose consumption correlates positively with income. The compensatory transfers are however the same for everyone and hence the short-term impact of the reform on income distribution can only have been egalitarian, although the extent of it is not known since no hard data are available as yet.

“The fear of runaway inflation was the most controversial issue prior to the reform.”

Public Opinion. Finally, it may be useful to consider selected results of an opinion poll on the reform carried out by an unidentified official agency. It covers Tehran, the capital city, and sheds some light on the hopes and anxieties of the public about a year ago, soon after the reform was launched. A majority of the respondents (62 percent) were of the view that most people would not be able to cover the extra expenses due to higher prices despite the transfer, even if they reduced their consumption. Some 33 percent thought that they could do so. A similar majority (65 percent) felt that the reform would help ‘correct’ the consumption pattern, although over a quarter (28 percent) had little confidence that it would. Perhaps most importantly, the respondents were split down the middle

between those who had much or very much confidence that the reform programme would be a success (40 percent), and those who had little or very little confidence in the same (39 percent). And more people rated the chances of the cash transfers continuing as little or very little (42 percent) than those who rated these chances as high or very high (36 percent). It should be noted that public opinion in rural and other urban areas that are less privileged than Tehran is likely to be more favourable to the reform as price subsidies tended to favour the better off whereas cash subsidies are the same for everyone, thereby benefiting relatively more those with lower incomes.

What Next?

The Iran model of reforming the system of energy subsidies is a bold attempt at pursuing the twin objectives of enhancing economic efficiency and social justice at the same time. While the extent of its success so far may be judged differently, and its longer-term impact remains to be seen, it has already passed a major test with flying colours: it has survived. This is no mean feat in view of its ambitious scope and scale, more so as it was attempted at a historical juncture in Iran that was far from ideal economically, politically, and in terms of the country's relations with the rest of the world.

The hardest part – getting it off the

ground and to cruising speed – may now be past but various challenges still remain. The second phase of the reform is slated to begin shortly. While speculation about the next round of price hikes is rife, no official announcement has yet been made. The parliament has put a cap of 20 percent a year for new increases, which could mean that fuel prices would likely rise by about 40 percent in the second round since there was none during the last Iranian year just ended. It has officially been announced however that the transfer amount would rise by Rls280,000 (about \$23) per capita when new prices go into effect.

A further challenge now is to reduce the number of participants in the cash transfer programme so as to leave more funds for distribution to those with lower incomes. The sad fact of the matter is that, as things stand today, there is a trade-off between the coverage of the population and the amount of the transfer per person since the net proceeds that can be distributed to households is determined exogenously. The funds now going to the rich are entirely at the expense of those less well off. The current plan is to urge higher income earners to opt out of the transfer programme voluntarily. Households with an income above a couple of thousand dollars a month (a fairly large amount of money in Iran) are being invited to consider giving up their cash

subsidy in whole or in part (the options are the entire amount, half the amount or any addition to the transfer amount in the second phase of the programme). No one knows how they will respond. If enough of them agree to withdraw, the matter will have been settled. If not, the government will have to decide how to proceed.

Two final points may be made about the role and importance of the cash subsidy component of the reform strategy. The first is that the compensatory character of these transfers made it possible for the price reform to go deeper and faster, thereby amplifying the impact of relative price changes on resource allocation. In efforts at price reform, therefore, the scale of price adjustments may not be as critical as it is often presumed to be, so long as the adverse effects can be moderated or removed entirely through compensation, particularly for poorer people.

The second point has to do with a fortuitous outcome of the reform effort, although no one was looking for it as such. Iran has now become the first country in the world to boast of a nationwide basic income that pays every citizen a certain amount of cash on a regular basis, unconditionally. The proponents of basic income are particularly keen to see the experience in Iran succeed in institutionalising an idea that, despite its promise, has been rather hard to sell, not least in the rich countries. ■

Iran's Energy Subsidy Reform: lessons – and a predicament

SHIRIN NARWANI argues that Iran's subsidy reform still faces many challenges

After several previous failed attempts at reforming its subsidy system, which dated from its war with Iraq in the 1980s, Iran, in December 2010, implemented reforms that addressed one of its economy's most enduring distortions. This was made possible because the government built a consensus among the public, industry and political figures, across differing political views, about the benefits of subsidy reform: reducing waste and consumption and the secondary benefit of redistributing the country's energy revenues in a more equitable way.

A communications strategy emphasised

that any undesirable secondary impacts would be offset by complementary policies that would redirect revenues received from price increases to low-income groups and energy-intensive industries. The government laid the groundwork for a functional system of compensatory disbursements (initially targeted at poorer segments of the public then broadly expanded) and an escalating tariff structure that helped soften the impact on the less wealthy.

Given the lack of mass protests despite staggering price increases, the initial phase of the plan appears to have been well conceived. In comparison, following Iran's

efforts, several attempts at subsidy reform by other countries have either failed to take off in the face of massive public opposition (Bolivia, Pakistan) or been characterised by a common pattern of two steps forward, one step back (Nigeria). Although the reform process is far from complete in Iran, useful lessons can be drawn by analysing the rationality and long-term sustainability of the measures employed in the context of Iran's particular circumstances.

Predicament One Year Later

A year into the reform process, the government's main objective of reducing

waste and consumption appears, according to official figures, to be realised; yet the policies employed to ease the removal of subsidies have been either only partly implemented or appear to be unsustainable.

Iran's Cash Compensation Scheme

A compensatory scheme that helped raise the public's acceptance of the reforms has emerged as a major dilemma for the government. The original subsidy reform statute stipulated that revenues received as a result of price increases would be distributed by allocating 50 percent in compensatory disbursements to the public, 30 percent to energy-intensive agricultural and industrial enterprises, and 20 percent to the Treasury to cover the administrative costs of the reform programme.

With more recipients than originally forecast, the Majlis (parliament) later increased the public's share from 50 to 80 percent, the share for agriculture and industry was reduced to 20 percent, while the Treasury's share was withdrawn. However, even this decrease of the Treasury's share has proved insufficient to meet the IR455,000-a-month (about \$40-a-month) payment to recipients, who now, according to the government, make up almost all Iran's 75 million population. The government has had to find other sources to fund these payments; these include loans from the central bank, revenues raised from the export of oil and other goods, energy company loans and public funds. The resulting public deficit incurred from December 2010 through September 2011 is \$13.8 billion.

An assistance policy that was intended to provide aid to low-income groups and energy-intensive industries over the span of the reform has instead emerged as a uniform payment to almost all citizens and, according to reports, has not distributed the requisite amounts stipulated by law to the production sector. These industries and companies have argued that the higher price of energy input is affecting their competitiveness and that there have been few or no mitigating measures to assist them. It is not, as was originally planned, self-financing, and it has placed substantial new fiscal obligations on the Treasury.

Given that the monthly cash transfers to the public are not being met by

revenues generated from partial subsidy removal, and given that there may be less funds available as a consequence of a drop in the price of oil, sanctions leading to the discounting of oil or a decrease in exports, the government will either have to reduce the number of recipients or augment annual deficits. While Mohammad Reza Farzin, the head of the Subsidies Reform Organisation, has said that 10 million of the wealthiest individuals will be removed from the cash-back scheme during the second phase of the programme, President Ahmadinejad has promised that he will double or triple the amounts paid out to those remaining.

"Given the lack of mass protests despite staggering price increases, the initial phase of the plan appears to have been well conceived."

The government's dilemma is that the elimination of even 10 million individuals from the programme will only result in savings of about \$4.8 billion; even if this is not reallocated to the rest of the recipients, it will not make the programme self-financing. Further pressure will also be placed on the Treasury if the Majlis succeeds in ensuring the production sector's stipulated allocation. Despite their significant problems, however, the cash handouts are now regarded as permanent by many and will not be reduced or withdrawn easily. The government has so far been unwilling or unable to remove recipients from the cash transfer programme and has asked wealthier individuals to voluntarily abstain. Shifting political currents will make it difficult to eliminate families from this scheme, and it is highly unlikely, that state support will be withdrawn from middle-to low-income groups.

Iran's experience and potential future difficulties point to the conclusion that, unless administered as originally intended – with compensation using only revenue raised from price adjustments and mitigation measures that protect industry and low-income groups for a limited time period – a universal and uniform cash-back scheme is not the best way of

approaching subsidy reform. One subsidy is replaced by another, thus continuing or, in Iran's case – increasing the burden on government budgets.

Taking the Shock Route: a high impact on demand

Iran's reform strategy of maximising initial price increases was the most effective way to significantly impact demand and reduce the risk of future popular opposition to consecutive price adjustments. Previous attempts at a gradualist strategy of subsidy reform, part of Iran's Development Plans from 2000 onward, had either failed or been stopped by politicians. President Ahmadinejad and his administration argued that a gradual approach to price adjustment, while still causing some economic hardship, could create rising inflationary expectations. A subsidy reform statute that was initially ambiguous about cost/price adjustments over the five-year period, allowed the president to maximise the price shock rather than gradually increase prices, as favoured by the Majlis (though a later amendment to the law only allows a 20 percent annual price rise).

Iran's domestic fuel consumption mainly comprises gasoline. With smart cards introduced during gasoline rationing in 2007, an escalating tariff structure was already in place; in December 2010, this structure remained and was used to raise the price of gasoline between fourfold and sevenfold. Diesel fuel, by comparison, was raised about ninefold. Other products' prices were raised between 3.5 and 10 times. Electricity prices were doubled, then on an escalating tariff structure.

A year into the reforms and the consumption of oil products has shown a marked decrease. According to the government, the country's gasoline consumption is down 9.9 percent, from 81 to 73 mn litres a day (after growing 9 percent the previous year); kerosene consumption is down 2.9 million litres a day, a drop of 19.7 percent; furnace oil consumption has decreased 36.5 percent, from 18.1 million litres a day to 11.5 million litres; and electricity consumption is down 8 percent (from an increase of 10 percent the previous year). The National Iranian Oil Products Distribution Company puts the decline in demand for oil products in the ten months after the reforms at between 4

and 19 percent, with gasoline declining by 5 percent, kerosene by 19 percent, diesel by 4 percent, and LPG by 14 percent. Although these figures differ, the least case scenario still reveals a significant drop in demand.

The price adjustment for natural gas also had an initial significant impact on demand, particularly in power generation. Iran experienced two gas price shocks within six months; the first was an increase of more than 400 percent followed by a further 20 percent adjustment. Comparing gas consumption in power generation in the five months from March to July 2011 with the same period a year earlier reveals a 10.8 percent reduction. When taking into account a negligible reduction in gas consumption in the residential and commercial sectors, the total reduction in gas consumption during this period was 5.7 percent compared with the previous year.

Even negligible reductions in demand are significant because, previously, there were large increases in annual energy consumption. Critics of shock therapy believed that the initial large price adjustments would lead to high-double or even triple-digit inflation. Although there was a rise in anticipated inflation, it has not been as high as expected. Iran already faced inflationary pressures and had reduced inflation down from 25.4 percent in 2008 to 10.8 percent in 2009 and 12.4 percent in 2010; inflation rose to about 20.6 percent this past year. (These figures are from the Central Bank; unofficial estimates are

higher for all figures.) In a country that had among the lowest fuel and gas prices in the world and a consumption rate that was doubling every decade, maximising and front-loading the price shock was the most effective way of facilitating a significant demand response and ensuring progress in the reform process.

Challenges Ahead

Iran's subsidy reform programme has succeeded beyond early expectations in that the government was able to substantially and permanently adjust prices without mass protests. The reforms have also managed, in their initial phase, to achieve their main objective of a reduction in energy consumption. However, the authorities face political and economic challenges that do not bode well for their objective of raising prices of subsidised energy close to prevailing world levels. Some of these challenges were present before the reforms: high unemployment and inflation; and the adverse effects of economic sanctions. New pressures include: tougher sanctions; the need to deal with the reported 1.6 million households that are not paying their gas bills (they have been advised to pay in instalments); the challenge of finding affordable mitigating measures to compensate both individuals and industry; and decisions on proceeding with further price adjustments against a background of increasing economic hardship.

A recent new problem that may press the issue of price adjustment is the impact of the devaluation of the rial on fuel

smuggling. The fall of Iran's currency against the US dollar has made its fuel extremely cheap to neighbouring countries; this has reportedly led to a significant increase in fuel smuggling, which had eased following subsidy reform. Because of international sanctions banning fuel sales to Iran, the country needs all the gasoline it produces for domestic purposes. The government may have to adjust the price of free-market gasoline upward to counter the effect of the devaluation of the rial, while maintaining some price support for domestic consumption with quotas for semi-subsidised gasoline.

With all of Iran's current economic and political problems, subsidy reform is not a priority. Although there is a general consensus on the need to push ahead with the reforms, the government continues to clash with the Majlis on the same issues: compensation, the pace of price adjustment and the timing of the reforms. Phase two of the reforms has reportedly been delayed from March until July of this year. The recent parliamentary election results indicate that President Ahmadinijad may face a more hostile environment in the last year of his second term. This, combined with the possibility of a new government in 2013 opposed to President Ahmadinijad's vision of accelerated subsidy reform, may mean that the reform process continues at a slower pace or that it is stopped in its tracks. Ultimately, the reforms will continue to be vulnerable to changing political currents. ■

Energy Subsidies in Russia: Natural Gas is the Final Challenge

JAMES HENDERSON discusses Russia's gradual reform of energy prices since the breakup of the Soviet Union

The fuel subsidies available in Russia over the past two decades have been a legacy of the Soviet era when cheap energy offered an economic benefit to industrial and household consumers founded on the USSR's fortunate inheritance of abundant hydrocarbon resources. Largely they have involved the sale of oil, gas and electricity to domestic customers at below comparable international prices, although in some instances (in particular with reference

to gas) domestic prices have been below the marginal cost of production and transport to market. However, the gradual removal of these subsidies has been a key strategy of many of the Russian governments during the post-Soviet era, with the goal of improving the country's energy efficiency and resource management as well as addressing the imbalances in the energy economy, and for a number of fuels these goals have already been met.

For example, as early as 1992 the IEA reported that domestic oil prices were largely being determined by market forces, and the domestic market for crude oil was fully liberalised on 1 January 1995, with oil product prices following later in the same year. Producers and distributors were then allowed to market their crude oil and products in the domestic market at prices determined by the forces of supply and demand. The effect was that the domestic crude price rose from 1 percent of global

levels in 1991 to 30 percent in 2000, with the continuing gap being due to a domestic oversupply caused by bottlenecks in the Russian crude export pipeline system, the large amount of transfer pricing within Russia's vertically integrated oil companies at artificially low prices and the intermittent imposition by the Russian state of limits on crude and oil product exports. However, by 2005 the domestic crude price had effectively reached export netback parity, meaning that it is now priced at global levels less transport costs and export tax, with the result that the Russian government's control over the price level is now restricted to its power to set the level at which these two variables are charged. Perhaps more importantly, oil products in Russia are also priced on a par with global markets. (According to data from InfoTEK and Renaissance Capital the Russian oil product basket has been trading in line with the export netback equivalent since 2005.) Indeed at times of high demand in Russia the prices for gasoline and diesel have exceeded export netback parity due to a historical shortage of upgraded domestic refining capacity that has occasionally resulted in the need to import higher value products (such as gasoline) into western Russia at global prices plus additional transport costs.

Russia's coal industry has also seen a transformation from heavy subsidisation in the early years of the post-Soviet era to a fully privatised and market-oriented sector in 2012. The change over less than 20 years has been dramatic, as in 1993 the Russian state budget supported 80 percent of the sector's activities, with the subsidies to the industry accounting for more than 1 percent of GDP. However, the government committed to a plan to remove subsidies by 2001, and in tandem with this strategy also implemented a sector-wide privatisation programme that led to more than three quarters of production being in private hands by the end of 2001. As a result Russian coal price is now fully liberalised and the domestic market operates on a competitive basis, with the major pricing issue being the cost of transportation to both internal and export markets. Indeed, as will be discussed later, coal finds itself at a disadvantage to gas, its major competing fuel in Russia, in any location other than the regions where the coalmines are situated both because of high transport costs and also because of

the continued low price of gas in Russia.

Market reform has also impacted the electricity sector, thanks to a privatisation and price liberalisation process that was catalysed by the bitterly cold Russian winter of 2005–06 when certain regional transmission and distribution systems were operating at beyond their theoretical maximums and brown-outs became a real threat. With the need for new investment obvious, the Russian government was forced to create an environment in which both domestic and foreign companies could hope to make adequate returns and as a result the state monopoly UES was broken up and sold while price deregulation was also gradually introduced. Although even as recently as 2009 the level of domestic electricity prices implied a state subsidy totalling \$15 billion, by January 2011 full liberalisation of the wholesale market had taken place and prices for

“The fuel subsidies available in Russia over the past two decades have been a legacy of the Soviet era.”

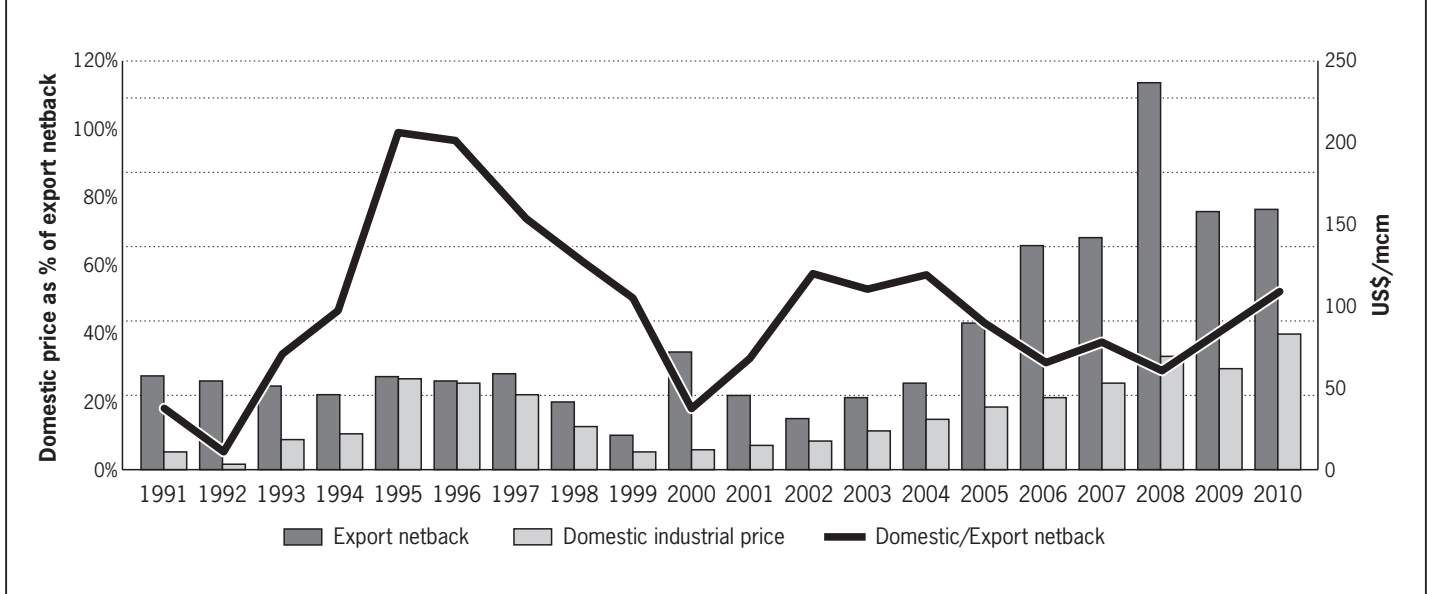
industrial customers are now being set on a cost-reflective basis. Prices for residential customers remain regulated by region, and indeed specific caps were imposed in early 2011 due to pressure from consumers over price rises that were regarded as excessive by the federal government. These caps left a number of power companies struggling to balance their books due to rising fuel input costs, but as this sector only accounts for around 20 percent of Russian power demand it is clear that the goal of removing subsidies from the industry has largely been achieved.

However, in contrast with the liberalisation seen in the oil, coal and power sectors in Russia prices in the gas sector remain at a significant discount to the international market (even on a netback basis) and have only recently reached a level at which the cost of production and transport to market can be covered. This anomaly is gradually being addressed by the Russian government, but as of early 2012 it continues not only to undermine

a number of the key goals set out in the country's energy strategy but also to distort the balance of Russia's energy economy.

The price for gas sold in the Russian domestic market by the country's largest company, Gazprom, has been regulated since the end of the Soviet era, reflecting Gazprom's near monopoly position in the 1990s and the fact that it had inherited the majority of its production from the Soviet Ministry of Gas at very low cost. Other gas producers can sell at market prices, but as Gazprom has historically accounted for 80–90 percent of production the regulated price has tended to act as a dominant benchmark. This regulated price has generally been set at well below the international price for Russian gas, and indeed this led to Gazprom making a loss on all its domestic sales until 2009. The discrepancy between Gazprom's export and domestic sales is emphasised by the fact that even in 2010, after a decade of significant domestic gas price increases, export sales to non-FSU countries account for only 30 percent of sales volumes but more than 50 percent of revenues, meaning that prices for domestic customers continue to be subsidised by the high prices which Gazprom can charge for its export sale. The Russian administration, spurred on by a desire to increase energy efficiency, meet WTO standards and encourage industrial restructuring, has made a number of efforts to reduce this implicit subsidy to Russian consumers over the past 20 years. In the mid-1990s, as oil and coal prices were being liberalised, gas prices were tied to domestic inflation, which was so high (up to 2000 percent in 1995) that export netback parity was rapidly reached (see Figure 1). However, this had a disastrous impact on industrial and residential consumers, who could not afford the dramatic rise in prices, and non-payments rose so sharply that Gazprom received cash for only 12 percent of its domestic sales in 1997.

Gazprom's position was undermined even further by the economic crisis in 1998, when domestic gas prices collapsed to US\$12/mcm, equivalent to only 12 percent of the export netback price, meaning that Gazprom was not only providing cheap gas relative to international prices but was selling to domestic customers at well below marginal cost. The arrival of Putin as President of Russia in 2000

Figure 1: Russian Industrial and Export Netback Prices, 1991–2010

Source: IEA, Federal Tariff Service of Russian Federation, Author's calculations

saw a renewed emphasis on provision of support to state energy companies, but price increases of 20–25 percent p.a. from 2000–2005 still left domestic gas prices at only 42 percent of the export netback level in 2005. By this stage Gazprom was feeling increasing financial pressure as the core fields on which it had been relying to provide cheap gas during the post-Soviet period were now in decline and it was also facing growing competition from ‘independent’ producers such as Novatek and the Russian oil companies, who were keen to expand their sales at unregulated prices. A further issue for the Russian gas industry was that domestic demand, encouraged by low prices and rapid GDP growth, had grown by 12 percent since 2000, and export sales had increased by a similar amount, adding to the pressure on gas supplies.

As a result Putin announced a 5-year plan in late 2006 to fully liberalise the domestic gas market by 2011 and to encourage gas prices towards export netback parity. At that time the international oil price, which is the main benchmark for Russia’s gas export price, was \$50 per barrel, implying that Russia’s domestic gas price would have to approximately double by 2011 for the target to be met. However, doubling of the oil price since 2006, with the consequent increase in the price of Russia’s gas export price, has moved the export netback parity target significantly, leading many Russian

politicians to become concerned about the impact of much higher gas prices on the domestic economy. As a result the target for full market liberalisation has been moved from 2011 to 2015, and a more likely outcome is perhaps closer to 2020 or beyond.

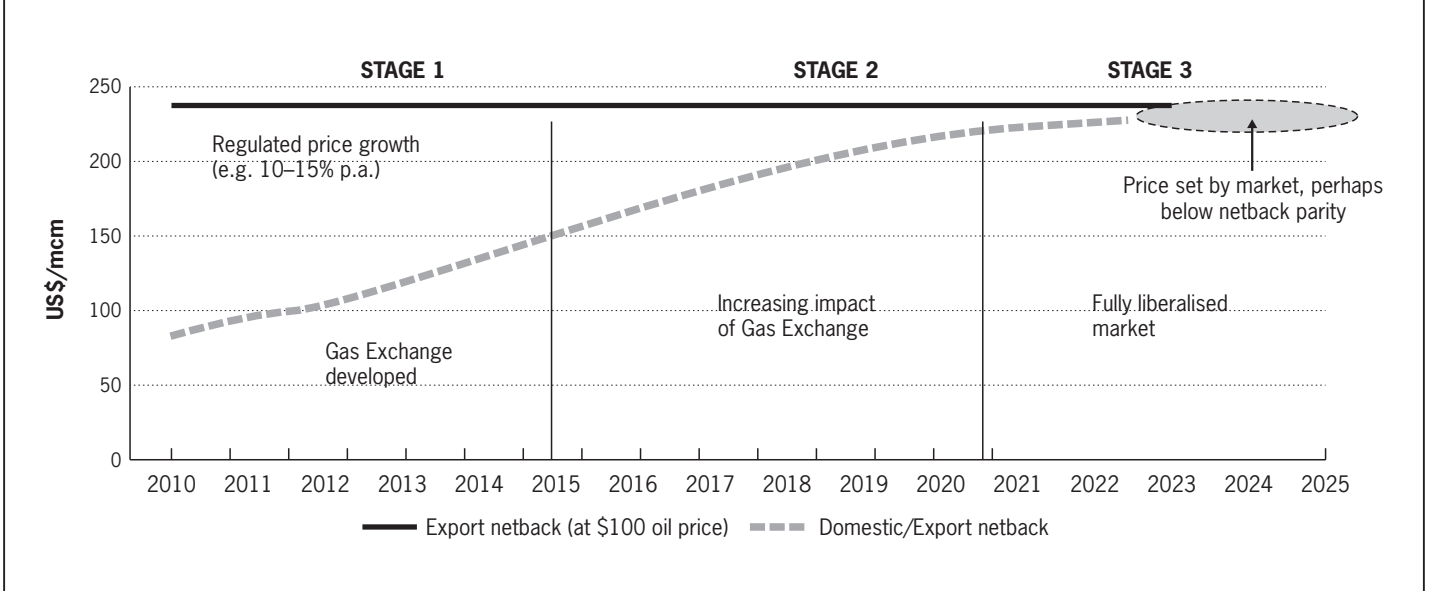
Indeed the pressure for achieving netback parity for domestic gas prices has

“The arrival of Putin as President of Russia in 2000 saw a renewed emphasis on provision of support to state energy companies.”

been alleviated by a number of factors. Firstly, regulated prices in 2012 now exceed \$100/mcm and are close to the \$120–130/mcm range that would underpin the development of Gazprom’s huge new developments on the Yamal peninsula. Secondly, it would appear that non-Gazprom producers such as Novatek have very significant productive capacity that could be profitably brought onstream even at current prices, potentially replacing the declining gas production from Gazprom’s mature fields. Thirdly, the Russian government has yet to put in

place the reforms that would allow it to control the gas sector via an independent transport system rather than via control of prices. And fourthly, there would appear to be no need to force netback parity on an economy where an abundance of relatively low-cost gas could be produced and sold profitably by multiple suppliers based on a market-related pricing system.

Therefore, it would seem most likely that the implicit subsidy of low domestic gas prices in Russia will only be removed in gradual stages (see Figure 2). Over the next five years (approximately) it seems likely that a regulated prices system will remain in place, increasing domestic prices by around 15 percent per annum. During this period the re-introduction of a Gas Exchange, which was initially used to establish a market price for small amounts of gas in 2007–08, could help to establish the levels at which industrial consumers are prepared to buy extra gas. In a second stage, perhaps from 2015–2020, this Gas Exchange could begin to become a fully-fledged price-setting mechanism, allowing greater competition between Gazprom and independent producers to establish a true market price for domestic gas sales. A third stage (beyond 2020) could then see full liberalisation of the gas market, with an independently regulated transport system and free trading of gas for the majority of consumers (in particular in the industrial and power sectors). At this point it is clear that the domestic price

Figure 2: Potential Development of the Pricing of Russian Gas in the Domestic Market

Source: Author's estimates

would certainly be above the marginal operating cost of production and transportation, although there is no certainty that it would be at export netback parity, especially if Russia maintains its current single export channel.

It would therefore appear likely that the subsidisation of gas prices in Russia will be removed over the next decade as prices rise towards export netback parity in an increasingly liberalised market. Residential customers may be offered some extended protection, although prices in that sector have been rising ahead of industrial prices in recent years, but the cost of gas in the industrial and power sectors could more than double by 2020 on the assumption that the global oil price remains above \$100 per barrel. However, the gradual nature of this change will mean that other distortions in the Russian energy economy will also be relatively slow to change. Perhaps most importantly, until a fully liberalised market is introduced Russian gas producers will not be able to provide the country with its optimal supply mix, as Gazprom's higher cost production will be supported by a rising regulated price. Only when market forces determine the choice of gas supply can the lower cost gas that is owned by many non-Gazprom producers make a full contribution to Russia's gas balance. Furthermore, in the power sector the imbalance of coal and gas prices in key demand areas located away from mining

districts will keep coal uncompetitive for the foreseeable future, meaning that any plans to reduce the share of gas as a fuel input to the power sector are likely to fail. Indeed the influence of gas on the electricity sector is set to increase as major gas producers diversify into power generation to take advantage of the extra margins that can be generated. As evidence of this

"In the power sector the imbalance of coal and gas prices in key demand areas located away from mining districts will keep coal uncompetitive for the foreseeable future"

trend Gazprom is now Russia's largest power generator by installed capacity.

In more general terms, Russia's overall energy efficiency targets will also be harder to meet while the price of its major fuel remains low. Russia's energy strategy to 2030 envisages the potential for saving 45 percent of total primary energy supply, including a 240bcm reduction in gas demand/waste. However, as long as the price for the fuel which accounts for over 50 percent of TPES remains well below international levels it will be difficult to

incentivise consumers to invest in the necessary change without using the type of regulatory enforcement that has seen the oil companies forced to reduce gas flaring over the past five years.

Therefore, although gas is now being sold in Russia at prices that can allow producers to make a profit, it remains the case that low gas prices for domestic customers continue to be effectively supported by the higher prices that Gazprom can charge for its export sales. This anomaly is gradually being unwound, with potentially profound effects on both domestic and export customers for Russian gas, but the full impact is unlikely to be felt until 2020 at the earliest. Importantly though, two factors that could accelerate this process would be a collapse in the global oil price or a change in the pricing structure for Gazprom's export sales, both of which could lower the price for Russia's gas in international markets and bring netback parity closer in the domestic market. With Gazprom already being forced to renegotiate the terms of its contracts with European buyers to include a non-oil related spot price element, it may be that the removal of the domestic gas price subsidy is ultimately taken out of Russia's hands. ■

To the Editor:

In response to your Issue 87 (February 2012) devoted to oil market benchmarks, I have a number of comments to share and observations to make. There are three areas which I believe received either inadequate attention or none whatsoever from your collection of ten contributors:

1. What are the long-term implications for market-based benchmarks, especially in light of long-term production trends;
2. The immediate issue that looms over the BFOE (Brent Blend, Forties, Oseberg, Ekofisk) market – price convergence between its several legs; and,
3. What are the direct implications of what major producers and China are saying about oil benchmarks? I will address each of those directly.

Long Term – Production Countdown

Both the North Sea, especially the BFOE streams, and North America have been undergoing substantial changes in oil production levels and prospects for future oil production, and these changes are in opposite directions – the North Sea is depleting and North America is increasing. With respect to the North Sea, this could be said to date back more than 20 years but, in less than five years, BFOE has declined by more than one-third and currently struggles to stay above 1 million barrels per day. But even that characterisation can be misleading because, despite it being referred to as BFOE, it is really only F – forties – whose price serves as the benchmark and that has been the case for nearly 10 years. In the everyday mechanics of price determination, B, O and E are essentially ballast.

The situation is completely reversed for the USA and Canada. Production is up significantly in onshore US, and Canada and is expected to rise even more sharply. Projections are that US and Canadian production will increase by more than 5 million barrels per day over the mid-term and that would be in addition to the 1 to 2 million barrels per day increases it has experienced in recent years.

The impacts from these changes will not be limited to simply shifting the relative prices between oil delivered in the USA and oil delivered in Europe. At

minimum, North America will be exporting more oil products and, its importance as a cog in the world oil market will strengthen, not weaken. In addition, Canadian and US oil production are freely tradable and much of each already re-trades several-to-many times over in the physical market. WTI's importance in the oil market originated in its role as physical market *numeraire* and the growing North American market is going to continue to require and benefit from such a *numeraire*; so North America will continue to be an important source for a crude oil price reference.

Meanwhile, the decrease in North Sea production has already impacted performance of the BFOE mechanism at times – there may be disagreement over how much and how often – but, as the production decline continues, this is becoming more commonplace. Has the market reached consensus that adding more letters to the string BFOE is the prescription to prevent this? Isn't anyone else concerned that there needs to be at least a minimum level of production to support a pricing mechanism based on loadings of cargos? Among the contributions included in Issue 87, the one that debunked myths about the Dubai benchmarks concluded very persuasively that production (as well as some other things) does matter. The structural changes that await the North Sea benchmark would appear to dwarf anything that has been either applied or contemplated to date. We are surprised and puzzled that this received so little attention in Issue 87.

Regarding the future for North America and WTI in particular, the future begins right around the scheduled release date for this Issue (88); because that is when the Seaway pipeline will begin to flow oil, including WTI, southward to the US Gulf. This is only the beginning, but another of your contributors provided many details of the scheduled additions in both pipeline and railway capacity that are forthcoming; and those additions in capacity are substantial in scope (1–3 mmb/d) and they will have a substantial positive impact on the continuing evolution of oil benchmarks. In the near-term, the Seaway reversal and other completed or soon-to-be

completed actions will literally connect the Midcontinent southward to US Gulf markets (notwithstanding several other existing points of connection), and this will bolster the WTI mechanism. In terms of prognosis, the only thing market participants are speculating on regarding this mechanism is how it may expand further over the mid-term, in light of increased US and Canadian production and increased throughput to the US Gulf.

Near Term – Brent Market Convergence

Even with at least five of your Issue 87 contributors focusing significantly on Brent, they largely chose to sidestep the most important immediate issue regarding Brent – the performance of the convergence processes between the sub-components of the Brent complex. This issue has spawned disagreement within the industry as to who is chiefly responsible and one of your contributors did take a side in that dispute. The bickering, however, has not centered on the processes of convergence. In fact, it may be serving more as a distraction from what is truly important – how convergence processes work and how they perform.

Building on the detailed work provided by several of your contributors, I divide the BFOE market into the components of futures, forward cargos (which are considered 'paper' because they have not been assigned loading dates) and dated cargos (which are considered 'physical' because they have been assigned loading dates). In principle, these are the components that need to connect in terms of pricing. Traded dated cargos are priced predominantly as differentials to the *Platts* Dated assessment. Similarly, the *Platts* Dated assessment is also frequently used in some national oil company sales formulas as well. The *Platts* Dated assessment is essentially derived from the mathematical sum of two other assessments by *Platts* that are determined in their eWindow Market-on-Close (MOC) mechanism. Each of these assessments is for a financially settled swap contract though, for one of them (BFOE partials), there is the extremely rare occurrence when the obligation matures into physical

delivery. Sidestepping the precise details of either swap, the essential reality is that the *Platts Dated* assessment is not either bounded by or grounded in physical delivery obligations; so, from that perspective, it is not tethered to the physical market. However, from a different perspective it is connected to the physical market because it is the base by which virtually all traded dated cargos (which are physical) are priced. Though it is never identified as such, the *Platts Dated* assessment process, especially as conducted through the two MOC processes, is really a negotiation mechanism for oil market participants to determine the physical price of BFOE cargos. That is an important role and it would probably be more illuminating if it were described precisely in those terms.

Regarding futures contracts, they need to terminate either through physical delivery or financial settlement, and Brent futures are terminated through financial settlement. The settlement mechanism is supposed to be structured to mimic the value for the underlying commercial market and, for Brent futures, the underlying commercial market is 'reported' traded BFOE forward next-month cargos (and its predecessors from previous decades) on contract termination day. However, for some time now, there has been a dearth of such cargos when the futures contract expires. There are several reasons for this: 1. The reduction in production of BFOE has resulted in a continuing reduction in the number of cargos; 2. The 'reporting' of cargos is purely self-selecting and most cargos are not reported – in fact very few next month full-cargos seem to get reported during any part of a calendar month; and 3. By the time the most active Brent futures contract expires, a significant portion of the next month's forward cargos have been displaced by dated cargos.

The disagreement I referred to derives from the perception by some in the oil market that the third reason has been exacerbated this year because of a change in the minimum required notification period that a forward BFOE cargo is scheduled for loading. But I wonder if the bickering has diverted attention from other more chronic issues that influence the quality of convergence. The self-selection which governs the reporting of traded cargos is independent of both minimum notification periods and futures contracts

termination dates; so, even if the bickerers reach consensus on those items, they are not addressing anything related to the self-selection character of reporting traded forward cargos which has led to virtually none being reported. In fact we at CME Group (NYMEX) feel so strongly about trying to improve the convergence process that we introduced a new Brent futures contract at the end of 2011 with a new cash-settlement mechanism that eliminates the self-selecting component altogether from the mechanism. We believe that leads to a much healthier convergence process.

Meanwhile, the reduction in BFOE production has led to frequent disruptions in scheduled loadings over the past year and it is reasonable to suggest, as some market observers have, that these unscheduled disruptions have impacted BFOE prices and pricing; arguably more than market supply, demand or storage. During the first quarter 2009, the front part of the Brent curve, especially *Platts Dated* versus the 1st-month forward, was in backwardation more than 30 percent of the time even though OECD petroleum storage levels were at historical highs and the world was suffering the most substantial levels of demand destruction since the onset of the Brent mechanism. Since November last year, OECD's commercial stocks have been approximately at the same levels they were in 2009 in terms of day's supply and, yet, the BFOE market – in terms of futures and Dated to 2nd-month forward – has been stubbornly backwardated; are these market fundamentals or are these market mechanism impacts? If it is the latter, are there other impacts as well? In Issue 87, one of your contributors emphasised that the WTI-Brent spread during 2011 cannot be explained by WTI fundamentals even though he was solidly convinced that WTI's price is governed by fundamentals; so he attributed it to expectations of WTI fundamentals. However, BFOE's history over the past several years to defy the commercial stocks data directly increases the probability that the explanation lies elsewhere.

View from Outside

Frequently there is industry discussion about devising a new Arab Gulf based benchmark, especially for crude oil

exported to the Far East. However, major Arab Gulf producers have stated they do not want their actions to be the determinative factor in establishing, increasing or reducing a benchmark's use. Historically, the *Platts Dubai-Oman* and *Oman futures* prices have maintained a correlation of approximately 99 percent in their daily Singapore Window timeframe price changes. *Oman futures* trade more than 5 million barrels per day (and is methodically rising) and results in physical delivery of about 10 million barrels each month. Collectively, these mean that: 1. *Oman futures* provide an extremely reliable hedge for *Platts Dubai-Oman* based pricing; and, 2. *Oman futures* converge smoothly with the physical market.

Major Arab Gulf producers have further said that they would follow the lead of their customers in establishing, increasing or decreasing the use of any benchmarks. Perhaps, figuratively, China is assuming that leadership. China is a significant consumer of oil – over 11 mmbd – and it has said publicly that it is concerned that higher oil prices hurt its economy's growth and that is one of the reasons it is supporting the development of oil futures in China.

I mention each of these because I expect them to become increasingly more influential during the next several years – producer sentiment on the adoption of benchmarks, the potential for *Oman futures* to increase its use for hedging and China's hint that consumers will be adopting more aggressive positions in price determination. All of these are notable and warrant more attention.

Conclusion

Thank you for the opportunity to share my views on oil benchmarks. I believe that long-term trends in production capacity and levels favour North American benchmarks versus the North Sea. I also believe that current issues on price convergence in Brent can be improved but they must first be confronted. And I believe some of the most important influences on oil benchmarks over the next several years could emanate from outside the established benchmark realms.

*Robert Levin, Managing Director
Commodity Research and Product
Development, CME Group*

Asinus Muses

Colonialism and its discontents

Poor Spain. Suffering one of the worst depressions in history, burdened by an austerity imposed by outside powers, out of the blue comes a further humiliation. In an outrageous show of personal power and disregard for international norms, one country's head of state has personally brought to heel a foreign colossus, inviting international opprobrium and dismay, and further damaging their country's already-dismal reputation. That's right: from a country known for the ritual torture of bulls, King Juan Carlos of Spain shot an elephant on safari in Botswana, with the head of the Spanish World Wildlife Fund reporting that 'This unfortunate episode has become known across the world and we are receiving vast numbers of energetic complaints.'

Speaking of energetic complaints, in other news, Argentina's President Cristina Fernández has decided to re-nationalise YPF, seizing shares owned by the Spanish energy group Repsol. As history has shown repeatedly, Argentina's appearances on the global stage never lack charisma. Like any great performer, it reprises its signature role with enough variation to sustain the audience's interest: having played the international financial pariah to pitch-perfection in its snub of the international bond market at the end of 2001, its latest performance features a snub of the international stock market. By taking ownership of 51 percent of the shares of the formerly-national oil company YPF, privatised in the 1990s under the famously-corrupt President Menem, it has once again sent waves of fear and loathing through the community (I use the word ironically) of international investors. Among other things, the Argentines objected to a lack of investment and production that had led to a swing from

a \$6bn fuel surplus in 2006 to a \$3bn deficit last year.

From elephant to ruminant

The Financial Times' usually-stiff upper lip has been sent aquiver, and it seems able to report on little else. This obsession may be a symptom of cognitive dissonance. With one hand it branded President Cristina 'a populist lunatic seemingly determined that her people do not participate in an economic golden age for Latin America', while with the other hand it quoted a former Repsol executive as saying that the company's 'business model has been based on YPF being a cash cow, and reinvesting that into other areas through the company's extravagant dividends policy. Such a model is hardly designed to please President Cristina, for whom the nationalisation is but one of many steps taken to keep dollars in the country. Moreover, as an honest beast of burden, Asinus is particularly sympathetic to the outrage at being likened to a mere ruminant.

Fifth-rate fulminations

Perhaps the most eloquent contribution to the debate has been footage from 2008 of Mariano Rajoy, current Spanish Prime Minister, unearthed for the occasion and aired on Argentine television. In response to the possibility that Lukoil might buy shares in Repsol, he declared 'Our oil, our gas and our energy can't pass into the hands of a Russian firm, because that would convert us into a fifth-rate country.' Again, not a promising background for someone who wants to argue against the re-nationalisation of an oil company.

Mis-placed vanity

After President Cristina herself, the charismatic Argentine most involved in the nationalisation is 41 year-old Professor

Axel Kicillof, former leader of the student political group with the incendiary name of TNT (which, they would joke, stood for Tonto, pero No Tanto, or silly, but not so much). Kicillof has become an international celebrity overnight. While suffering various smears – the Financial Times, after snootily commenting that he 'does not appear to own a tie,' repeated the myth that he had learned German in order to read Marx in the original – Spanish Vanity Fair breathlessly described him as 'Attractive, super dad, nerd, and brain behind the expropriation of YPF'. Alongside pictures of his beautiful wife, it went on to quote him as immodestly declaring, 'I am the present and the future of Argentina.' Unfortunately they had taken this 'quote' from a satirical Argentine newspaper. One thinks they might have noticed since in the same column Kicillof is presented as describing himself as having 'innate sensuality,' being 'Informal, but serious. Sexy, but consistent.' Despite Argentines' notorious self confidence, Asinus feels that this should have raised editorial suspicions.

The wrong sort of rocks

After Fukushima, energy and earthquakes already had an uncomfortable association. This was hardly improved by the finding that shale gas fracking (or perhaps that should be fracking shale gas) twice caused tremors outside Blackpool last year. Yet, an extension of fracking to the rest of the UK has just been approved by the government. Apparently the seismic implications were due to an 'extremely rare' combination of factors, including pre-existing faults in the rocks. Asinus is reminded of Network Rail's classic excuse for train delays that 'the wrong sort of leaves' have fallen on the train lines. Silly Blackpudlians for having inferior geological formations underfoot.

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