The challenge of higher oil prices

Adjusting to higher oil prices: The challenge for developing Asia

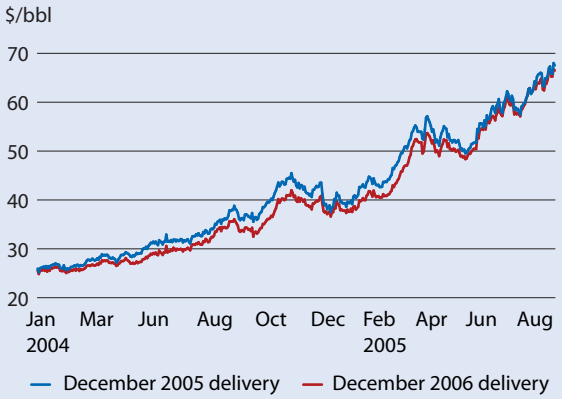
Oil prices have risen higher—again. Benchmark Brent crude oil prices have averaged $53 per barrel (/bbl) in 2005 through 31 August. Prices climbed toward the $70 level in late August, or nearly three quarters as high again as at the beginning of 2005. No fall in prices seems imminent: oil price futures for end-December 2005 and end-December 2006 delivery are about $67/bbl (Figure 3.1). These developments were not expected. The *Asian Development Outlook 2005*, released in April this year, assumed an average $41/bbl for 2005 and $39 for 2006.

The region of developing Asia and the Pacific is potentially vulnerable to high oil prices. It is a large net importer of oil (in this section oil is taken to include petroleum energy products excluding natural gas) and much of its rapidly expanding energy needs are met by oil. Developing Asia produces about 11% of the world's crude oil, but consumes more than 20% of it, and this gap is widening. Economies in developing Asia are nearly as oil intensive in energy consumption and much less energy efficient than most industrial countries. For each unit of gross domestic product (GDP), measured at market exchange rates, developing Asia consumes nearly five times as much energy as Japan and nearly three times as much as the United States (US).

Despite its dependency on oil and a threefold increase in nominal oil prices since 2003, the region has performed well economically. But past resilience does not mean that developing Asia is immune to high oil prices. Signs of stress are indeed starting to surface: inflation is creeping up; fuel subsidies are beginning to cast a large shadow over fiscal prospects in some places; and high oil prices may become a prominent factor that will further prolong the region's generally anemic investment demand—outside the People's Republic of China (PRC)—that has prevailed since the Asian crisis.

Sustained high oil prices will require policy responses, and the ingredients of these responses will vary among countries. In many oil-importing economies, fiscal and monetary adjustments will be needed to stabilize impacts on prices and output. Where oil consumption is subsidized, higher prices raise questions about the affordability and objectives of oil price subsidies. For poor countries with limited borrowing capacity, higher import fuel bills could present financing difficulties. But net oil exporters also face challenges. Governments there will need to consider how best to use the

Figure 3.1 Brent futures prices, January 2004–August 2005



Source: Datastream, downloaded 1 September 2005.

additional revenues generated by oil and, if higher prices persist, how to manage pressures for exchange rate appreciation. Over the longer term, governments across developing Asia will need to take decisions about the role of oil in meeting their country's energy needs. Policy choices need to be guided by a framework that promotes greater energy efficiency and environmental sustainability of growth.

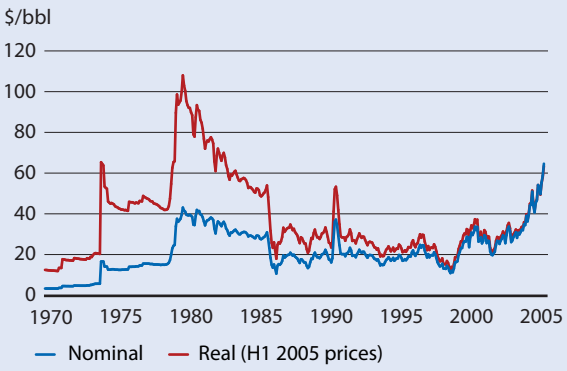
This part of the *Update* reviews the possible consequences and challenges presented by high oil prices for developing Asia. After a brief review of why prices are high, their impact on various economies in developing Asia is examined. Policy responses to structurally higher oil prices are then surveyed, including a brief discussion on the risks inherent in subsidizing oil products. The review ends by setting out key principles for guiding policy decisions, and offering some conclusions.

Why are oil prices so high?

Figure 3.2 shows nominal and real prices for Brent crude for the past three and a half decades. Although oil prices continue to set new records in nominal terms, in real terms they remain well below the peak established in the oil shock of 1979, having generally fluctuated within a broad band of about $20–40/bbl. At about $60–70/bbl, today's prices are high compared to their historical average, though they would have to rise by another $35–45/bbl to hit the peak of $107/bbl (2005, first-half inflation-adjusted) seen during the month of November 1979 at the time of the Iranian revolution. The peak annual average price, also in 1979, is $83/bbl (2005, first-half inflation-adjusted), a level closer to today's prices. The increases in nominal oil prices seen during the recent run-up have also been more modest and gradual than the earlier shocks.

Of course, oil prices reflect underlying fundamental forces of demand and supply, and the demand for oil has seen steady growth, largely propelled by Asia's strong economic performance. For example, between 1990 and 2003, for the world as a whole, annual demand for oil grew at 1.3%, while for the PRC and India combined it expanded at 7%. Together, these two countries have accounted for almost 40% of the growth in demand since 1990. The impact of rising incomes on oil demand in these two Asian giants—their income elasticity of demand for oil is thought to be about 50% higher than in the rest of the world (Verleger 2005)—has been magnified by their comparatively inefficient use of energy.

Figure 3.2 Brent crude oil prices, 1970–2005



Sources: International Financial Statistics online database, available: http://ifs.apdi.net/imf/ifsbrowser.aspx?branch=ROOT; Datastream, downloaded 1 September 2005; US Bureau of Labor Statistics, available: www.bls.gov.

Despite substantial increases in oil prices, demand remains robust. Driven by still-strong growth in the US and developing Asia, global oil demand reached 82.8 million barrels per day (mb/d) in the first half of 2005, or an increase of 1.3 mb/d from the same period in 2004 (though this increase is substantially less than the surge in the first half of 2004). For the entire year, demand is now projected to average 83.7 mb/d. As a whole, the increase in developing Asian demand accounted for nearly half of global demand expansion in 2004. Although oil demand is expected to rise more slowly between 2005 and 2006, it will remain robust, with projected growth in the range of 1.5–2.1 mb/d (depending on the forecasting agency).

Shorter-run influences are also at work on prices. In the face of severe capacity constraints, refiners have joined the drive to increase operating inventory levels. In the first half of 2005, OECD stocks rose to 54 days of forward consumption, compared with an average of 51 days since the second half of 2002. Most countries lifted their inventories as a consequence of tight and volatile supply. For much of 2005 futures prices have exceeded spot prices, helping

maintain upward pressure on spot prices by reducing the cost of carrying inventories.

Investment in refining capacity has been too low, and a mismatch has emerged between the type of refining capacity now required and what is available. For some time, world oil demand has been driven by high-quality "light" crude (oil of low density or containing a low wax content, which makes production and refining easier) and by "sweet" crude (oil with a low sulfur content). Recent additions to production capacity have, though, largely been in the "heavy" and "sour" grades of crude, which are more difficult and costly to refine.

This lack of investment in appropriate refining capacity and limited substitution possibilities has pushed retail prices up. Since the value "stored" in a barrel of crude rises when final product prices rise, higher retail prices also help lift crude prices. For example, during July and August, higher gasoline and diesel prices caused by refinery outages in the US caused those refineries still operating to bid up the price of light, sweet crude so that they could profit from the high retail prices.

In the first half of 2005, world supply increased to 84.1 mb/d, up by 1.7 mb/d on 2004's level. At that time OPEC's spare capacity had been reduced to about 2.2 mb/d. However, once countries that are prone to supply disruptions, such as Iraq, Nigeria, and Venezuela, are excluded, spare capacity is a meager 1.4 mb/d. Given this narrow buffer, events that threaten to disrupt supply are now transmitted very quickly to prices. For instance, an early start of the hurricane season this year along the US Gulf Coast was the main culprit for the price surge in July, while anxieties over Iran's resumption of nuclear activities and fears of terrorist attacks on Saudi Arabia lifted the price further in early August. Hurricane Katrina pushed up the price in early September.

Looking ahead, there are proven oil reserves sufficient to cover current global consumption needs for over 40 years. But investment in oil production, refining, and distribution infrastructure has been paltry following a protracted period of low prices through the late 1980s and 1990s. The oil industry is now moving from an exploitation phase to an investment phase. In this changing environment, the rise in long-dated oil prices reflects expectations of higher long-run marginal production costs. Long-dated prices also incorporate a premium linked to financial risks. Actual costs are a function of project complexity, host-country policies, and a range of other factors—including the supply of equipment and skilled labor—none of which is known with much certainty. Recent reports of very large cost overruns for the Sakhalin 2 liquefied natural gas project in Russia and the Athabasca oil sands project in Canada vividly illustrate the financial risks and the difficulties of investment planning. Although the recent surge in long-dated oil prices makes investment potentially attractive again, investment of current strong cash flows into new oil production projects remains slow. Investors are delaying decisions in the face of cost uncertainty, and new sources of supply will come onstream only gradually.

Higher oil prices are expected to stay for the remainder of 2005 and through 2006. A recent study by Goldman Sachs projects that oil prices are likely to be sustained at over $60/bbl over the period 2006–2010 (Goldman Sachs 2005). After a long period of both low prices and low investment, binding constraints are being felt along the length of the supply chain. Together with fundamental tightness in the current crude oil supply/demand balance, there are also several significant risks that could cause prices to rise further or to spike, including robust global demand (and unpredicted surges in demand from a large country such as the PRC), weather- and accident-related disruptions, and heightened geopolitical uncertainties.

Why high oil prices matter

As developing Asia consumes more oil than it produces, higher oil prices are likely to eat into its income growth. By how much will depend on the extent to which oil prices rise and how long they remain elevated. For net oil-importing countries, the impact will depend on a range of factors, including their oil and energy intensity and the ease with which needed adjustments take place. For net oil-exporting countries, higher oil prices raise oil sector profits but these benefits are often highly concentrated and can be offset by negative effects elsewhere. To understand

possible impacts, it is useful first to look at how developing Asia's economies depend on oil.

Oil and energy dependency in Asia

Table 3.1 profiles developing Asia's reliance on oil in 2003. Dependency is measured in four ways, using five indicators: oil self-sufficiency; intensity of oil use in energy consumption; energy intensity of GDP, both at market and at purchasing power parity exchange rates; and per capita oil consumption. The oil self-sufficiency index measures oil production less consumption in relation to oil consumption. Thus a value of -1 signifies that a country has no oil production and is totally reliant on oil imports; a positive number means that a country is a net exporter. The intensity of oil use in energy consumption index measures the share of oil in an economy's primary energy consumption. If a country relies only on oil to produce energy, the value of the index is 1; if no oil is used in producing its energy, the value is 0.

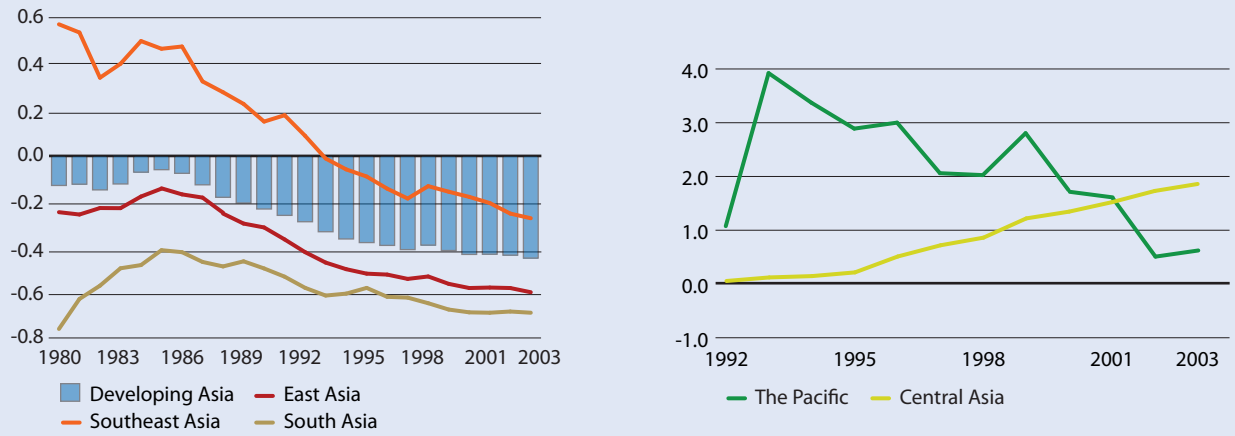
The third and fourth indicators show a measure of the energy intensity for an entire economy (energy consumption divided by GDP). This measure is standardized on the energy intensity of the G7 countries. For example, a value of 2 would mean that the country in question uses twice the energy as the G7 average per unit of GDP. This measure is presented for both nominal GDP calculated at market exchange rates and for purchasing power parity-adjusted GDP from the *World Economic Outlook* database of the International Monetary Fund (IMF). The fifth indicator simply divides annual oil consumption in barrels by a country's population.

Developing Asia shows considerable diversity in oil self-sufficiency (Table 3.1, "Oil self-sufficiency" column): several countries are net oil exporters, but many more are totally reliant on oil imports. In addition, its reliance on imported oil has trended up through time: in 2003, 44.7% of oil consumption was imported, compared with just about 10% in the mid-1980s (Figure 3.3).

At the subregional level, South Asia is the most reliant on imports followed by East Asia; Southeast Asia has also become a net importer as Indonesia's production has failed to keep pace with consumption. Central Asia and the Pacific are net oil exporters, though the position of the Pacific masks the complete reliance on imports of all countries but Papua New Guinea (and Timor-Leste, which is not included in the *International Energy Annual 2003* figures due to lack of data). In Central Asia, the Kyrgyz Republic and Tajikistan are highly reliant on imports.

Vulnerability to rising oil prices depends not just on oil self-sufficiency but also on the intensity with which oil is used to produce energy. In the mid-1980s, oil met about 30% of developing

Figure 3.3 Oil self-sufficiency index, 1980–2003



Notes: 1. The oil self-sufficiency index is oil production less consumption, divided by consumption. No domestic oil production is equal to -1.0. 2. Prior to 1992, Developing Asia excluded countries in Central Asia. 3. Before 1992, all Pacific countries were net oil importers; in that year, Papua New Guinea became a net oil exporter.
Source: Energy Information Administration, *International Energy Annual 2003*, available: www.eia.doe.gov.

Table 3.1 Oil and energy use, developing Asia, 2003

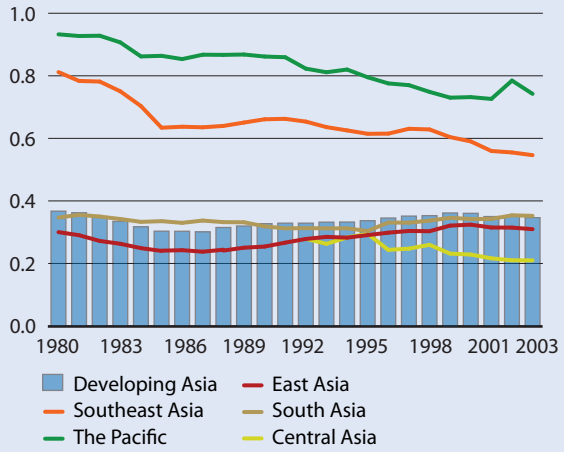
Subregion/Economy	Oil self-sufficiency	Intensity of oil use in energy consumption	Energy intensity of GDP Nominal	Energy intensity of GDP PPP	Oil consumption per capita (barrels)
East Asia	**-0.600**	**0.310**	**3.188**	**0.907**	**2.4**
China, People's Rep. of	-0.361	0.250	4.259	0.877	1.6
Hong Kong, China	-1.000	0.628	0.739	0.573	13.9
Korea, Rep. of	-0.999	0.520	1.891	1.138	16.5
Mongolia	-1.000	0.257	10.453	2.677	1.8
Taipei,China	-0.991	0.457	1.939	0.971	14.8
Southeast Asia	**-0.277**	**0.546**	**2.684**	**0.821**	**2.6**
Cambodia	-1.000	0.932	0.263	0.039	0.1
Indonesia	0.074	0.507	2.624	0.801	2.0
Lao People's Dem. Rep.	-1.000	0.117	3.149	0.608	0.2
Malaysia	0.648	0.445	2.959	1.205	7.5
Myanmar	-0.512	0.364	2.496	0.332	0.2
Philippines	-0.957	0.550	2.125	0.446	1.5
Singapore	-0.988	0.888	2.523	2.143	60.5
Thailand	-0.685	0.529	2.898	0.840	4.8
Viet Nam	0.632	0.460	3.304	0.648	1.0
South Asia	**-0.690**	**0.352**	**3.072**	**0.573**	**0.7**
Afghanistan	-1.000	0.533	-	-	0.1
Bangladesh	-0.919	0.288	1.553	0.301	0.2
Bhutan	-1.000	0.121	3.866	0.972	0.5
India	-0.649	0.343	3.230	0.588	0.8
Maldives	-1.000	1.000	1.610	0.480	5.0
Nepal	-1.000	0.500	1.363	0.225	0.2
Pakistan	-0.817	0.383	3.439	0.729	0.8
Sri Lanka	-1.007	0.846	1.425	0.338	1.5
Central Asia	**1.811**	**0.210**	**13.175**	**3.456**	**3.5**
Azerbaijan	1.664	0.415	11.789	2.714	5.5
Kazakhstan	3.689	0.216	8.987	2.654	5.4
Kyrgyz Republic	-0.819	0.121	12.863	2.570	0.8
Tajikistan	-0.986	0.190	21.996	4.683	1.4
Turkmenistan	1.542	0.224	9.143	2.867	6.0
Uzbekistan	0.015	0.148	32.550	6.225	2.2
The Pacific	**0.667**	**0.742**	**1.690**	**0.513**	**1.5**
Cook Islands	-1.000	1.000	-	-	7.9
Fiji Islands	-1.000	0.754	1.590	0.722	4.4
Kiribati	-1.000	1.000	0.829	0.234	0.8
Nauru	-1.000	1.000	-	-	27.7
Papua New Guinea	2.366	0.685	1.813	0.459	1.0
Samoa	-1.000	0.768	1.179	0.321	2.1
Solomon Islands	-1.000	1.000	1.542	0.412	1.0
Tonga	-1.000	1.000	1.324	0.282	2.9
Vanuatu	-1.000	1.000	0.619	0.245	1.1
Developing Asia	**-0.447**	**0.346**	**3.227**	**0.847**	**1.7**
Non-oil exporters	-0.654	0.342	3.118	0.805	1.7
Memorandum items					
G7	-0.591	0.403	1.000	1.000	18.6
Japan	-0.978	0.505	0.692	0.796	16.0
United States	-0.561	0.395	1.192	1.153	25.1

- = data not available, PPP = purchasing power parity.

Notes: 1. The oil self-sufficiency index is oil production less consumption, divided by consumption; a positive number indicates self-sufficiency. No domestic oil production is equal to -1.0. 2. Intensity of oil use in energy consumption is petroleum consumption divided by energy consumption. 3. Energy intensity of GDP, for both nominal GDP (at market exchange rates) and GDP measured at purchasing power parity, is expressed relative to the average of the G7 countries, which is normalized to 1.

Sources: Energy Information Administration. 2005. *International Energy Annual 2003*. Washington, DC, available: http://www.eia.doe.gov/iea/; IMF. 2005. *World Economic Outlook* April database, available: http://www.imf.org/external/pubs/ft/weo/2005/01/data/index.htm; World Bank. 2005. *World Development Indicators* online database, available: http://devdata.worldbank.org/dataonline/.

Figure 3.4 Intensity of oil use in energy consumption, 1980–2003



Notes: 1. Intensity of oil use is the share of petroleum in total energy consumption. Oil is sole energy source at 1.0. 2. Prior to 1992, Developing Asia excluded countries in Central Asia.
Source: Energy Information Administration, *International Energy Annual 2003*, available: www.eia.doe.gov.

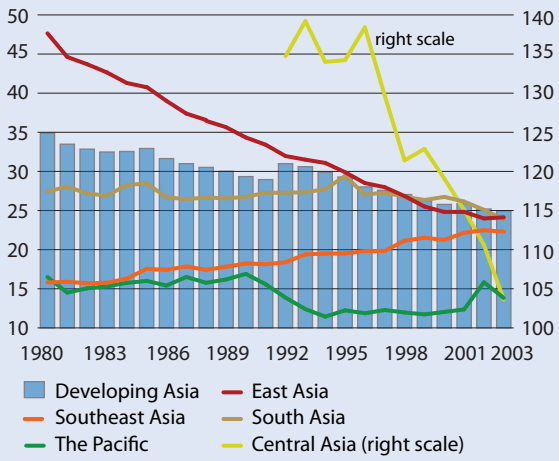
Asia's energy needs, or much the same as in 2003 (Figure 3.4). However, the oil intensity of energy consumption is much more pronounced in some countries than in others (Table 3.1, "Intensity of oil use in energy consumption" column). A notable feature is that small island economies are highly dependent on oil for their energy needs. Elsewhere, oil intensity is highest in Southeast Asia and lowest in Central Asia and the PRC, due to their use of alternatives, such as natural gas, hydropower, and coal.

The energy intensity of GDP (Table 3.1, "Energy intensity of GDP" columns) is affected by several factors, including a country's climate, size, and stage of development as well as whether it produces and refines oil. Countries that have colder climates consume more energy, other things being equal, while countries with a large oil contribution to GDP are likely to be more energy intensive. The energy intensity of GDP also varies with income levels: across countries, it tends to be low for the poorest but then rises with per capita income, before tapering off at higher income levels. These features of the relationship between energy use and real output (GDP) show up in divergent patterns across developing Asia (Figure 3.5). East Asia has become much less energy intensive over time but the energy inputs into GDP have risen in Southeast Asia while South Asia and the Pacific have been on a flat to slightly declining trend. The economies of Central Asia have also as a whole become less energy intensive, possibly because of changes in economic structure during their transition to being more market oriented.

In comparing developing Asia's energy intensity with other countries, it matters greatly whether GDP is measured in nominal terms at market exchange rates or in purchasing power parity rates. In nominal market terms, developing Asia consumes over three times as much energy as the G7 per unit of output. But in purchasing power terms, developing Asia is less energy intensive than the G7. Only countries that are major oil producers or refiners, or which have very cold winters, are more energy intensive than the G7 average. A "true" picture of energy intensity in developing Asia is likely to lie somewhere between the nominal and purchasing power parity-adjusted GDP measures. But it is highly likely that, for identical activities, for example power production, developing Asia is less energy efficient than industrial countries.

The last column of Table 3.1 shows per capita

Figure 3.5 Energy intensity of GDP, 1980–2003 ('000 BTU per unit of real GDP)



BTU = British thermal unit.
Notes: 1. Energy intensity of GDP is energy consumption in BTU per US$ of GDP (in 2000 prices). 2. Prior to 1992, Developing Asia excluded countries in Central Asia. 3. Before 1992, all Pacific countries were net oil importers; in that year, Papua New Guinea became a net oil exporter.
Source: Energy Information Administration, *International Energy Annual 2003*, available: www.eia.doe.gov.

Table 3.2 Net oil imports, developing Asia

Subregion/Economy	Estimated impact of a 75% price rise in the net oil import bill (% of GDP)
East Asia	**-1.76**
China, People's Rep. of	-1.11
Hong Kong, China	-2.07
Korea, Rep. of	-2.85
Mongolia	-12.56
Taipei,China	-2.28
Southeast Asia	**-1.23**
Cambodia	-1.19
Indonesia	0.54
Lao People's Dem. Rep.	-2.18
Malaysia	2.37
Philippines	-3.41
Singapore	-4.89
Thailand	-2.61
Viet Nam	-0.69
South Asia	**-2.31**
Afghanistan	-1.58
Bangladesh	-1.86
Bhutan	-2.37
India	-2.01
Maldives	-8.58
Nepal	-3.69
Pakistan	-4.17
Sri Lanka	-4.43
Central Asia	**16.02**
Azerbaijan	26.70
Kazakhstan	21.33
Kyrgyz Republic	-6.42
Tajikistan	-26.76
Turkmenistan	25.07
Uzbekistan	0.53
The Pacific	**-1.02**
Fiji Islands	-6.20
Kiribati	-5.70
Papua New Guinea	3.47
Samoa	-5.55
Solomon Islands	-6.68
Tonga	-7.35
Vanuatu	-3.42
Developing Asia	**-1.53**

Notes: 1. The base net import shares used in this exercise are derived from physical data on imports and exports of oil for 2002, the latest year available, and on the prices prevailing at that time. 2. Net import shares may vary depending on exchange rates, prices paid for oil, and other factors that affect output and the supply and demand for oil.

Sources: Staff calculations using data from the Energy Information Administration, available: www.eia.doe.gov.

oil consumption for developing Asia. These numbers show a strong positive association with per capita income, although other factors also matter. A measure of Asia's potential demand for oil is captured by the difference between the average per capita consumption of developing Asia and that of the G7. For developing Asia, these differ by a factor of more than 11 times.

Oil self-sufficiency, oil intensity of energy consumption, energy intensity of GDP, and per capita oil consumption are likely to be closely correlated with a country's susceptibility to oil price shocks. One way to bring this information together is to measure the potential impact of higher oil prices on oil import costs.

Impact of higher oil prices on import bills and export adjustment

In Table 3.2, the potential impact of higher oil prices on the (net) import fuel bill is shown. For this purpose, oil prices are assumed to rise by 75%, which is approximately the increase in prices between the start of 2005 and end-August. All costs are expressed as a percentage of GDP. In these calculations, higher prices are assumed to last for 1 year. As oil production and consumption are taken as given and there is no allowance for possible adjustments, these are estimates of potential costs rather than those that are likely. This simple, illustrative exercise also gauges the potential squeeze on domestic absorption of traded goods in circumstances where added import costs cannot be met by use of foreign exchange reserves or through external borrowing. To the extent that base-value shares of net oil imports have risen since 2002, which is the base year for the calculations in Table 3.2, potential impacts on oil import bills will be larger.

At the subregional level, this exercise suggests that South Asia is the most vulnerable to higher oil prices that work through rising fuel import bills. South Asia also has the lowest oil self-sufficiency index of all subregions and its GDP, measured at market exchange rates, is comparatively energy intensive. Impacts are also substantial for East Asia and Southeast Asia. A more modest impact for the Pacific is largely attributable to Papua New Guinea and its very heavy weight in the Pacific aggregate—but for individual Pacific island economies (apart from Timor-Leste), the potential

impact on import bills of higher oil prices is substantial. As a net oil-exporting region, Central Asia will potentially enjoy larger net export receipts from higher oil prices.

At the country level, Mongolia and Tajikistan seem to be the most exposed to the risk of a sharp rise in import fuel bills. Although potential costs could be exaggerated by the data used here, other sources too suggest large potential impacts: 6.8% of GDP for Tajikistan and 9.8% of GDP for Mongolia (International Trade Centre 2005). Potential impacts are also large for the Maldives, Pacific island economies (except Papua New Guinea and Timor-Leste), Kyrgyz Republic, and Singapore, ranging from 4.5% to 9.0% of GDP. Pakistan, Philippines, Nepal, and Sri Lanka face more measured impacts of about 3.0–4.5% of GDP. For other countries, including the PRC and India, potential costs are smaller but by no means insignificant. For developing Asia as a whole, imported fuel costs could rise by 1.5% of GDP, but this is after subtracting possible gains by oil-exporting countries.

Another way to measure exposure to higher oil prices is to identify by how much exports would need to grow to pay for higher import fuel bills. The data in Table 3.3 show the percentage point growth in exports that would be needed to offset the impact of a 75% rise in the fuel import bill on the trade balance. Again, it should be noted that to the extent that oil import costs have risen relative to exports since 2001–2003, the estimates in Table 3.3 may understate the ratios that would result from use of more recent data. Also, this is, once more, a partial calculation and so impacts should be interpreted as "potential" rather than likely.

The estimates in Table 3.3 bring out several points. For many net oil-importing Asian countries, the growth in exports that would be needed to pay for a 75% rise in the cost of imported oil is potentially large. The most pronounced impacts are in Mongolia and in some South Asian countries. Normally, such adjustments would occur through a depreciation of the domestic currency and a shift of resources from nontraded to traded goods activity. Even if higher prices were not sustained and these estimates were halved, temporary financing needs could still be significant. In some countries, financing needs might be met by a drawdown of foreign exchange reserves. But other countries face more difficult circumstances. Countries with large external debts, meager reserves, and limited borrowing capacity could face financing difficulties.

Table 3.3 Export growth required to pay for a 75% rise in fuel prices

Subregion/Economy	Export offset, percentage point change
East Asia	
China, People's Rep. of	2.3
Hong Kong, China	4.5
Korea, Rep. of	10.5
Mongolia	16.5
Taipei,China	5.3
Southeast Asia	
Cambodia	4.5
Indonesia	-9.8
Lao People's Dem. Rep.	11.3
Malaysia	-3.0
Myanmar	-6.8
Philippines	6.8
Singapore	2.3
Thailand	5.3
Viet Nam	-5.3
South Asia	
Afghanistan	6.8
Bangladesh	6.0
India	15.8
Maldives	8.3
Nepal	26.3
Pakistan	18.0
Sri Lanka	8.3
The Pacific	
Fiji Islands	6.0
Papua New Guinea	-5.3
Average	**3.0**

Note: Based on country averages for 2001–2003.

Source: Adapted from World Trade Organization. 2005. *World Trade Report*. Appendix Table 7, p. 25.

These estimates of the potential susceptibility of import bills and trade balances to higher oil prices omit many factors that will affect the eventual impacts. Oil product prices tend to move in step with crude prices but the correlation is not exact. To some degree, therefore, susceptibility will depend on the particular product mix of oil consumption. Producers and consumers will also adjust to higher oil product prices, as well as to changes in income, exchange rates, and interest rates. Important indirect effects will also follow from impacts on major trading partners and

Box 3.1 How higher oil prices impact on growth, inflation, and financial balances

In a net oil-importing economy, rising oil prices affect output, inflation, and the balance of payments, as well as the fiscal position, through several pathways.

First, increasing oil prices squeeze income and demand. At a given exchange rate, more domestic output is needed to pay for the same volume of oil imports. If the domestic currency depreciates in response to induced payments deficits, this further cuts the purchasing power of domestic income over imported goods. Since important trading partners are also likely to suffer income losses, slower growth of external demand aggravates these direct impacts. Higher oil prices also squeeze aggregate supply, since rising intermediate input costs erode producers' profits and may cause them to cut back on output. Lower profits may then eat into investment spending and cause potential output to fall over a protracted period.

Second, higher oil prices present an inflationary threat. Inflation is directly influenced through the weight of oil products in the consumption basket. Secondary or indirect impacts are felt as producers pass through some part of higher oil costs to the price of final goods. Induced effects follow if higher goods prices lead to higher wage costs that feed back into prices. But when oil prices fall, nominal wage and other price rigidities can limit the pass-through to lower final goods prices.

Third, rising oil prices have fiscal consequences. If the retail prices of oil products are subsidized, as they are in many Asian countries, outlays on fuel subsidies will ratchet up as prices rise. This may prompt cuts in government spending; if it does not, larger fiscal burdens will have to be borne. Indirectly, fiscal balances will respond to changes in income and expenditure.

In a net oil-exporting country, the impacts of higher oil prices are not always the mirror image of those felt by oil importers. Incomes rise in the oil sector, certainly, but domestic oil consumers (producers and households) may lose. The effect on aggregate demand and aggregate income is ambiguous and depends on a variety of factors. If, for example, most of the additional oil revenues are saved, or leak from the economy through profit remittances, negative consumption effects may dominate. The way in which the fiscal authorities use larger oil tax revenues is crucial. An excessive exchange rate appreciation could stunt growth in non-oil sectors.

Precisely how significant these various effects are will depend on many factors. The size of oil price rises is clearly important but so too is the reason for them. If higher prices are a result of strength in the global economy, then global demand is clearly less at risk. The duration of higher prices is also relevant. If higher prices endure, accumulated impacts will be larger. It also matters whether consumers and producers expect higher prices to be temporary or sustained: if they think that they are going to last, higher prices are likely to have larger impacts than if they are viewed as short-lived.

The credibility that the authorities enjoy in fighting inflation can be vital in this regard. If rising fuel prices unleash a cost-push inflationary spiral, as in the late 1970s, then output losses are likely to be magnified; but if inflationary impulses are quickly tamed, and inflationary expectations remain firmly anchored, impacts will be more muted. Flexibility in pricing and in markets will also help by encouraging the substitution that cuts the oil intensity of demand.

Structural factors are also important. If oil intensity is high, adjustments are likely to be more difficult. Importing countries with meager foreign exchange reserves, poor creditworthiness, and high external debts will have greater difficulty in coping with the added financing needs of higher oil prices. Where bank or business balance sheets are fragile, higher oil prices and slower growth may aggravate financial distress.

In sum, it is not easy to put all these pieces together and identify the possible impacts of higher oil prices on output, prices, and the balance of payments. In the real world, many changes occur together, some pulling in opposite directions. Higher oil prices may induce policy responses, which, themselves, influence income and prices. If changes are gradual and impacts deferred, they may prove difficult to separate from other ongoing developments. Identifying impacts is more complicated still because repercussions in one country are likely to spill over and affect others.

from policy responses to changing circumstances. Box 3.1 summarizes the different ways in which higher oil prices can affect an economy.

The Impact of higher oil prices on growth

Numerical simulation methods are needed to unravel the kinds of impacts of higher oil prices on growth that are described in Box 3.1. Any estimate of the impact of higher oil prices on growth is necessarily contingent on a large number of assumptions about the nature of the "shock," underlying economic structures and behaviors, and policy responses. In Table 3.4, the results of simulations of the impact of higher oil

Table 3.4 GDP and budget balance impacts of a rise in the oil price to $70 per barrel, 2006 (percentage points of GDP)

	GDP growth, OEF	Budget balance, OEF	GDP growth, IMF MULTIMOD (2000)
G3 (US, Japan, euro zone)	**-0.5**	**-0.3**	**-0.5**
China, People's Rep. of	-1.0	-0.1	-0.6
Hong Kong, China	-0.9	-0.1	-
India	-1.1	-0.9	-0.8
Indonesia	(-0.9) -1.1	(0.0) +0.2	0.1
Korea, Rep. of	-0.5	-0.9	-1.4
Malaysia	(-0.6) -1.1	(0.0) +1.0	-0.3
Philippines	-1.4	-0.8	-1.3
Singapore	-1.3	-0.4	-
Taipei,China	-0.2	-1.1	-
Thailand	-1.8	-0.7	-1.4

- = not available.

Notes: 1. The baseline is calculated under an assumption of oil prices at $53 per barrel from Q3 2005 to Q4 2006. The simulation is based on a rise in prices to $70, sustained over the same period. 2. The International Monetary Fund (IMF) numbers in the "GDP growth, IMF MULTIMOD" column result from scaling the impact of a $5 per barrel rise over a $25 per barrel baseline by 1.6, which is roughly equal to a 32% rise in the oil price. This assumes that impacts are linear, which they may not be, and are independent of the base starting price. 3. The IMF MULTIMOD estimate is for industrial countries, not an average for the G3. 4. For Indonesia and Malaysia, the numbers in parentheses show the estimated impact on growth and the budget balance when additional oil revenues accruing to government are recycled.

Sources: Staff calculations using OEF model (available to subscribers: www.oef.com), OEF data release, August 2005; and IMF Research Department. 2000. "The Impact of Higher Oil Prices on the Global Economy." Washington, DC. December, available: http://www.imf.org/external/pubs/ft/oil/2000/.

prices on growth and fiscal balances for selected developing countries in Asia are summarized. These simulations have been conducted using the Oxford Economic Forecasting (OEF) model. In the OEF model, higher oil prices squeeze aggregate demand and supply for net oil importers. Balance-of-payments adjustments occur through the real exchange rate. Indirect impacts are captured through the effect of higher oil prices on trading partners' growth, which affects exports. Cuts in investment may result in a smaller capital stock and permanent output losses, but growth should later return to its original trajectory. The model assumes that public sector savings or deficits adjust passively to the hike in oil prices, and that inflationary pressures are addressed through higher interest rates. The focus here, however, is on possible short-run impact effects and not on more protracted adjustment processes.

In Table 3.4, the results of the "GDP growth, OEF" column show percentage point differences in GDP growth for 2006 resulting from a $17/bbl hike in the price of oil over this *Update*'s $53/bbl baseline assumption, essentially a rise to $70/bbl. The results in the "Budget balance, OEF" column show percentage point changes in government budget deficits measured relative to GDP. It is assumed that higher oil prices start in the third quarter of 2005 and are sustained through the fourth quarter of 2006. All other factors are held constant. In reality of course, many changes occur together, so these calculations are indicative and do not constitute forecasts.

The simulated impacts reported in Table 3.4 are sizable for some countries. The OEF model simulations suggest that Philippines, Singapore, and Thailand are most susceptible to slower growth if higher oil prices endure through 2006. All these countries are large net oil importers, but negative impacts on growth are mitigated by expanded fiscal deficits. In the Philippines and Thailand, fiscal deficits increase by nearly 1 percentage point of GDP compared to the baseline. These fiscal impacts reflect automatic tax and expenditure adjustments as incomes and prices change, and do not take account of specific oil subsidy schemes, such as the substantial expenditures incurred over the last 18 months in a number of countries.

Simulated impacts on output growth in the PRC and India are smaller, but not insignificant. Although oil dependency is low in the PRC, the model traces relatively large negative growth impacts through external trade. Simulated fiscal impacts in the PRC are modest. The impact on

India's GDP growth is broadly consistent with its oil dependency. In India, growth is shielded through a large measure of fiscal stabilization, and the public sector deficit expands by 0.9% of GDP in response.

The OEF model suggests that higher oil prices would substantially reduce growth in Indonesia and Malaysia. Indonesia became a net oil importer in 2004, but its dependency on oil imports is still low. As Malaysia is a net oil exporter, it benefits directly from higher prices. The simulations suggest that any benefits accruing to oil producers are significantly outweighed by indirect impacts on exports as growth slows in major trading partners. These calculations assume, though, that additional fiscal revenues accruing from higher oil prices are added to government saving. If, instead, governments target the deficit and recycle oil revenues, a smaller negative impact on output is likely to follow. For Malaysia, the negative impact on growth could be as small as 0.6 percentage point of growth if the entire fiscal windfall is recycled. For Indonesia, the windfall is smaller, but could reduce the potential impact on growth from 1.1 to 0.9 percentage point. Again, these calculations make no allowance for the cost of fuel subsidies.

Measured in terms of its oil self-sufficiency and oil intensity of energy consumption, Korea is highly vulnerable to higher oil prices (Table 3.1 above). Korea's oil dependency and oil intensity of energy profile is very similar to that of the Philippines and therefore it might be expected that similar impacts are likely. However, compared to the Philippines and other oil-dependent countries, the estimated reduction in growth for Korea is small. The reason is that the model predicts substantial import compression, showing Korean imports' greater sensitivity to the real exchange rate following the rise in oil prices. Impacts are also moderated through more expansive fiscal accommodation in Korea.

IMF (2000) has also estimated the possible impact on growth of an oil price shock. These results have been used as a basis for imputing the numbers shown in the "GDP growth, IMF MULTIMOD" column of Table 3.4. For most countries, the OEF and IMF estimates are broadly similar, once allowance is made for the fact that Indonesia is now a net oil importer.

In its April 2005 *World Economic Outlook*, and drawing on the results of an associated background paper (IMF 2005), IMF revisited the likely impact of higher oil prices on growth. This update occurred in a context where the impact of higher oil prices on global growth in 2004 had been muted (Box 3.2). IMF considers a temporary rise in the price of oil to $80/bbl from a baseline of $46. In real terms, and measured in terms of annual averages, prices at this level would be close to the historical high of 1979. For developing Asia, IMF reports that output losses could be about 0.8 percentage point of GDP. Adjusted for differences in the scale of the assumed shocks, this estimate is substantially lower than the OEF model impacts and, indeed, those of IMF (2000) and the International Energy Agency (2004). But when IMF assumes that higher prices are sustained over a longer period, as more recent news emanating from the oil markets would seem to suggest, impacts rise to 1.3 percentage points of GDP.

There is clearly uncertainty about the likely impact of higher oil prices. Much depends on assumptions both about the size and duration of the shock, and about how various actors respond. For example, producer behavior in the OEF model implies both a rapid pass-through of higher oil prices to final goods, and consumer adjustment to changes in current income. However, competitive pressures and weaker demand growth may slow or limit the pass-through, and if consumers and producers believe that higher prices will be temporary, they are more likely to spread adjustments out.

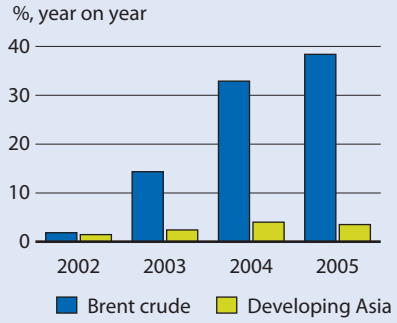
Despite this uncertainty, there is a consensus that, for developing Asia, the impact of higher oil prices will be negative. Drawing together the strands of evidence presented here, it seems that oil prices at about $70/bbl through to the end of 2006 could cut growth by over 1 percentage point in a number of countries. Some countries in Southeast Asia and South Asia could see growth trimmed by the most but there are offsetting positive factors that vary from country to country and that will influence actual growth outcomes (see Part 2 of this *Update*). The point bears repeating that developing Asia is now better positioned to absorb large shocks than it was at the time of the previous oil price shocks (see A*DO 2004 Update*, Part 3): external payments

Box 3.2 Oil prices, inflation, and GDP growth, 2004–2005

Between 2004 and 2005, GDP growth in developing Asia is expected to slow by about 0.8 percentage point, from 7.4% to 6.6%. Broadly, this is a reversion to trend. Several factors, in addition to higher oil prices, may have contributed to softening (see Part 1): some economies have been affected by a cyclical downturn in the electronics sector; slower growth of global trade has trimmed export growth; and in several countries, fiscal and monetary policies have been less accommodative.

It is difficult to be precise about the part that the various factors have played in moderating growth, though there are several reasons to think that the role played by higher oil prices has been muted. First, for much of 2004 and in early 2005, impacts ran largely from global demand (notably, US and PRC demand) to oil prices, not the other way round, thereby limiting the negative effects of higher oil prices on consumer and investor confidence. Second, over this period the escalation in oil prices was gradual, suggesting that impacts, too, may stretch out over time. Third, if consumers and investors had regarded higher oil prices as largely temporary, they would not have significantly adjusted their spending plans. And, fourth, consumers across developing Asia were to a significant extent shielded from the effects of higher prices by discretionary rises in government fuel subsidies and by firms limiting the pass-through to final prices through cutting markups. The box figure indicates that the recent upsurge in oil prices has had little impact in accelerating consumer price inflation.

Box figure Average inflation rates, 2002–2005



Sources: Datastream, downloaded 15 August 2005; *Asian Development Outlook* database; staff estimates.

IMF's *World Economic Outlook* in April 2005 assumed that average oil prices over 2005 would be about 23% higher than in 2004. On this basis, IMF calculated that higher oil prices might cut global growth in 2005 by 0.2–0.5 percentage point in a context where global growth is expected to slow by 0.8 percentage point. As developing Asia is a large net oil importer and the global estimate includes gains for net oil exporters, it might be expected that the effect of higher oil prices on slowing growth in developing Asia might be at the upper end of the IMF range. Indeed, as oil prices have climbed well beyond the IMF projection for 2005, it would be tempting to conjecture that output losses in developing Asia might be larger than the IMF upper bound. If this were in fact the case, little of the slowdown in 2005 could be attributed to other developments, including a dip in the growth of world trade volumes. More likely, the extensive use of fuel subsidies seen in 2004 and so far in 2005, helped by generally strong fiscal and foreign reserves positions, has contained output losses. This, though, raises the question of what is likely to happen as subsidies are scaled down or removed, a process that is now under way in several countries.

positions are more secure, monetary policy is more credible, fiscal strength is greater, and economic structures are more flexible and capable of adjusting more quickly than before. Although the region's appetite for oil continues to grow, the oil intensity of output is drifting lower.

In the next section, policy responses to higher oil prices are considered.

Policy responses to higher oil prices

No "one size fits all" response to higher oil prices exists. Across developing Asia, circumstances vary greatly and countries need to respond in different ways. For net oil importers, the challenges posed by higher oil prices will differ depending on their macroeconomic conditions, available financial resources, degree of access to international capital markets, impact on trading partners, economic structure, and fuel-pricing policies. For net oil exporters, structural factors will also be important, including their oil reserves, the ownership structure of the oil sector, oil taxation, the government's financial position, and the public sector's absorptive capacity. Matters are more complicated still, for all countries, because there is often a considerable measure of uncertainty about how long higher prices are likely to endure.

One small benefit of such uncertainty, though, is that it will generally commend a measured response, which can be reversed without incurring large costs. Looking to the long term, policies that influence oil consumption and use must be consistent with broader development objectives.

Oil subsidies and taxation

Many governments across developing Asia directly subsidize oil products, including kerosene, liquefied petroleum gas (LPG), and, generally to a lesser extent, diesel and gasoline. In some countries retail prices are openly subsidized and in others they are regulated or controlled through state-owned distribution channels. Indirect subsidies are also common, and are seen where products that have a high oil content, principally electric power, are provided at prices below their true cost. Even in countries where there are no open or indirect subsidies, taxation is often modest. Excise and customs taxes on oil products are a potentially important source of fiscal revenue that need to be maintained at an appropriate level both for budget revenue and the proper long-term allocation of the country's investment capital. In the recent run-up in oil prices, however, some countries have markedly reduced such taxes in an attempt to protect consumers.

Box 3.3 summarizes the experience of eight countries with fuel subsidies. Subsidies in these countries have so far limited the pass-through from higher crude oil prices to the retail prices of various oil products and therefore to final goods. This has certainly helped contain the inflationary impacts of rising crude prices, but in the absence of detailed study very little is known about exactly who benefits from these subsidies and by what amount.

Beyond concerns about the impact of higher fuel prices on the general population, the rationale for oil subsidies and discretionary increases in subsidies is not particularly clear. Subsidies do not eliminate the negative effects of higher oil prices on potential output. Demand must still adjust to the deterioration in the external payments position. Subsidies also add to the fiscal burden and represent an opportunity cost (in terms of the alternative uses to which scarce fiscal resources could have been put). In Indonesia, for example, the fiscal cost of oil product subsidies in 2005 will be larger than budgetary allocations for education and health combined. Raising subsidies or reducing excise taxes as oil prices rise creates deeper distortions, too. Subsidies underwrite fuel and energy inefficiency, retard the development and diffusion of cleaner technologies, and contribute to harming the environment. The rent created by subsidies also encourages fuel smuggling and other illegal activities.

Rising fiscal deficits, driven in part by growing fuel subsidies, have led some countries to scale down or withdraw subsidies. For example, on 12 July, having incurred fiscal costs of about $2.2 billion over an 18-month period, the Government of Thailand announced that all fuel subsidies would be removed by February 2006, and immediately ended all diesel subsidies. Malaysia's Government, which had earlier suspended excise taxes on gasoline and diesel, has now declared its intention to scrap subsidies on these two products. Malaysia has adopted a graduated approach and has so far lifted gasoline and diesel prices three times in 2005.

In Indonesia, too, diesel subsidies were cut earlier in 2005, but subsequent increases in the price of crude oil mean that expected budgetary costs of all subsidies have swollen and now exceed their 2005 appropriation. Other countries have problems. In Bangladesh, the state-owned oil distributor, Bangladesh Petroleum Corporation, is accumulating very large operating losses while the oil bill is putting pressure on foreign exchange reserves. In India, the federal Government has expressed concern about recently announced losses at major refining and oil marketing companies. Without doubt, similar pressures are being felt in other countries that are heavily reliant on imported fuel while selling it domestically at below imported cost.

Removing fuel subsidies clearly meets with formidable political resistance in some countries. But if subsidies are retained and higher oil prices do not recede, their fiscal costs will mount. One approach might be to remove subsidies first on those fuel types on which the poor do not depend. In most countries in developing Asia, gasoline subsidies are not provided or are relatively small, but, equally, taxation is often relatively modest given the income levels of gasoline consumers. Although diesel subsidies are widespread, and the poor do not directly consume much diesel, the

Box 3.3 Oil subsidies and fiscal strain

Governments in developing Asia have been trying to cushion consumers from the impact of soaring oil prices by subsidizing retail fuel prices, based on the belief that higher oil prices, as in previous episodes, will be temporary. However, it is becoming increasingly clear that higher oil prices may be here to stay for some time. Many Asian governments now face increasing pressure on their budgets from rising subsidy bills. This box illustrates the extent of the strain on the fiscal positions in eight countries in Asia.

Bangladesh

Since the 1970s, the petroleum sector has been served mainly by the state-owned Bangladesh Petroleum Corporation (BPC), which imports crude oil and petroleum products and operates the state refinery. The prices of BPC's petroleum products have generally been administered. However, instead of contributing to state revenues, BPC has in fact been losing heavily in recent years because it sells below cost.

The Government has lowered taxes on fuels used by the poor, such as kerosene and diesel, while taxes on gasoline remain much higher. In January 2003, it approved price increases on BPC's retail sales, effectively reducing consumption subsidies. This is partly reflected in the decline in BPC's losses for FY2003. The move also helped reduce smuggling into India from Bangladesh. However, with the continued increase in crude oil and in petroleum product prices, the Government has made only relatively small increases in some domestic prices, thus at the same time raising certain categories of effective fuel subsidization. This has generated larger losses for BPC, which are entirely financed by commercial and external borrowings. As a result of the Government's policy, diesel and kerosene were effectively being subsidized at 18.2% and 19.1%, respectively, of import/border prices in FY2004, translating into a total subsidy of $170.5 million during that fiscal year.

For FY2005, it is estimated that BPC losses were $445.4 million (about 0.7% of GDP). Since customs and excise taxes were cut in the FY2006 budget to reduce the company's losses, the Government is facing an immediate worsening of its fiscal position, in addition to its quasi-fiscal obligation stemming from BPC's large accumulated losses.

People's Republic of China

Domestic prices for crude oil and refined products are in principle linked to international prices with adjustments made after a 1-month lag. This mechanism, however, has not been consistently followed, especially for refined products, by the authorities that control prices. Moreover, price policies have not been consistent throughout the country, with a smaller degree of adjustment in domestic prices to rising global oil prices in the southern part of the country.

Increases in retail prices have fallen substantially behind increases in crude oil costs. This policy has muted the impact of rising global oil prices on inflation and on producers such as farmers who use diesel. However, it also means that PRC oil refiners have incurred losses reported at CNY4.19 billion (about $510 million) in the first half of 2005 as a result of the widening gap between their costs for crude oil and receipts for oil products. Some small refiners are reported to have cut or stopped production because of the losses, and others have diverted oil products to profitable markets abroad. Refinery output by the state-owned oil companies rose by only 0.5% in the first 7 months of this year from a year earlier. The pricing policy is one cause of shortages and reported hoarding of oil products.

India

The domestic petroleum prices are in practice still essentially administered; particularly sensitive are kerosene and LPG since these are used as cooking fuel by many rural poor. In the FY2004 government budget, the subsidy for kerosene and LPG was estimated at $776.5 million. The effective subsidy bill actually reached $4.8 billion, as state-owned distributors shouldered the $4.0 billion in un-recovered costs (losses) on sales of these products. There is no indication that the subsidy bill for FY2005 will decline, as subsidy estimates for the first quarter alone have run up to $2.2 billion and without price adjustments would exceed about $9.3 billion or 1.1% of GDP in the year.

Refiners and retailers have not been allowed to raise LPG prices since June 2004, and kerosene prices since April 2002. Marketing companies subsidize Rs92 of every LPG cylinder and Rs11 of every liter of kerosene. As a result, energy sector losses are mounting. In the first quarter of FY2005, Indian Oil, Bharat Petroleum, and Hindustan Petroleum suffered losses of $12.3 million, $98.5 million, and $116.1 million, respectively.

Box 3.3 *(continued)*

Indonesia

Indonesia became a net oil importer in 2004. While it imports at market prices, state-owned Pertamina sells petroleum products to consumers at subsidized prices. As of April 2005, the Government owed Pertamina about $2.6 billion in fuel subsidies, putting pressure on the company's cash flow and on its ability to pay for imported petroleum products. This has affected oil supplies to the country, which now faces petroleum shortages. Recent parliamentary delays in approving the Government's revised budget have further delayed partial payment of fuel subsidies to the company.

Even though petroleum product prices (except kerosene) were increased by 29% in February, the Government estimates that the subsidy bill will balloon to $12.5 billion (about 4.7% of GDP) by the end of the year if current crude oil prices persist. Last year, subsidies cost the Government $7.4 billion (2.9% of GDP). In the absence to date of further cuts in subsidies, government intervention is reduced to pushing the population to limit consumption. Car owners are also encouraged to use expensive, nonsubsidized premium fuel, which currently accounts for only 4% of domestic gasoline consumption. Television stations now close at 12 midnight, in a move intended to curtail nighttime energy consumption.

Malaysia

On 1 August, Malaysia increased prices of premium gasoline by 6.6% to RM1.62 per liter, regular gasoline by 6.8% to RM1.58 per liter, and LPG by 3.6% to RM1.45 per kilogram, in an effort to cut rising subsidies. Diesel prices were also lifted by 18.5% to RM1.28 per liter, except for fishers, who will receive increased subsidies to offset the price rise. Even as this is the fourth increase since October 2004 (and the third this year), prices in Malaysia remain among the lowest in Southeast Asia.

Fuel subsidies cost the Government $1.3 billion last year, and, despite the latest price increase, are expected to cost $1.7 billion in 2005. In addition, tax exemptions on gasoline will cost the Government an additional $2.1 billion, bringing this year's subsidy bill to $3.8 billion (about 2.9% of GDP).

Nepal

In 2003, the Government created an independent committee to set fuel prices, following heavy losses at the state-owned oil monopoly, Nepal Oil Corporation. While the committee was mandated to adjust prices in line with international trends, it has refrained from doing so, perhaps in the hope that price swings will ultimately cancel themselves out. The last price adjustment was only made in January 2005, and consequently the oil monopoly has been suffering losses of over NRs500 million a month. In the second half of FY2005, its losses reached $29.4 million. If domestic prices are not adjusted, its losses for FY2006 may exceed FY2004's $56 million (about 0.8% of GDP).

Thailand

In the wake of rising oil prices and inflationary pressures, oil subsidies that draw on the oil stabilization fund started on 1 January 2004. However, as sustained high oil prices began rapidly to deplete the fund, the Government made gradual moves to reduce the subsidies. First, the subsidy on gasoline was removed in November 2004. In March 2005, diesel prices were raised by B3 per liter. Then, the diesel subsidy was reduced to B1.30 per liter in June and eventually removed on 12 July 2005. Nevertheless, the Government still spent $2.2 billion in 18 months on fuel subsidies (about 0.9% of GDP over this period).

Subsidies on diesel alone cost around B300 million a day during the spending peak. At present, the oil fund is more than B80 billion in deficit. The Government still continues to subsidize the price of LPG, at a cost of around B500 million ($12.6 million) per month.

Viet Nam

Viet Nam is Southeast Asia's third-largest oil producer, though it spends more than half of its crude export revenues on importing petroleum products since it has no major refineries. In addition, the Government subsidizes retail prices, spending about 2% of GDP on this in 2004.

In order to reduce subsidies and curb smuggling into Cambodia and the PRC, in August 2005 the Government, for the third time, increased diesel, gasoline, and kerosene prices. In spite of this, the Government is still expected to spend about $350 million on subsidies in the second half of 2005. In the first half, oil importers lost $440 million, and so subsidies are expected to cost $790 million, or 1.6% of GDP in 2005. The Government is fully covering these losses.

Sources: National press reports, July–August 2005.

poor indirectly rely on it, particularly for transportation. But many non-poor also benefit from diesel subsidies, and the case for phasing out is strong.

For those fuels that the very poor rely on the situation is more vexed, and a range of factors needs to be carefully considered. In principle, it may make sense to replace fuel subsidies by income subsidies, but income-targeting approaches, e.g., vouchers, may prove difficult and costly to implement. In some situations, the removal of subsidies may not make much economic sense if the alternative is that poor people turn to other fuel sources, particularly biomass, which result in heavier environmental damage and costs to health.

Governments also need to be careful in considering the distributional impact of subsidies. Sometimes, as e.g., with diesel, subsidies are captured by the non-poor. This can happen where there are both monopoly control over distribution and regulatory failure. For example, the relatively large share of kerosene in total oil product consumption (see the appendix table to this part) in countries where kerosene is heavily subsidized is an apparent indication of problems in targeting subsidies. A decision to remove or scale back subsidies may be politically more palatable if some part of the fiscal savings is visibly earmarked for development programs that are fast disbursing and that directly benefit the poor.

As many decisions on energy production and use are taken by the private sector, it is important that oil prices reflect fully their social and environmental opportunity costs. This requires going beyond just removing subsidies on oil products. Oil taxes could provide an important source of budget revenue. Moreover, tax rates need to ensure that oil products are priced to fully reflect the negative externalities that they create in terms of pollution.

The price of oil products will be a major determinant of Asia's future demand, not just for oil but for alternative sources of renewable energy as well (Box 3.4). If oil is not suitably taxed, or is inappropriately subsidized, incentives to develop and adopt more energy-efficient technologies will be blunted and conservation will be hampered. This is a major reason why, in the past, developing Asia has not always adopted energy-efficient technologies, preferring cheap but less energy-efficient alternatives.

Macroeconomic policies

For net oil-importing countries, higher oil prices will require that domestic demand adjusts to a decline in potential output. The role of macroeconomic policies should be to ease needed adjustments to demand and supply and to guard against the possibility of a destabilizing inflationary spiral. Different economies will have varying degrees to maneuver in their policy responses.

In countries where the monetary authority enjoys credibility and where inflationary expectations are well anchored, monetary policy may be able to accommodate some of the direct impact of higher oil costs on final goods prices. But if higher oil prices threaten to percolate through to rising wages in a second round of cost increases, or inflationary expectations become heightened, the monetary authorities should consider tightening. This will help guard against the risk that higher oil prices unleash a cost-price spiral, magnifying output losses over a protracted period. This was the experience across much of Asia during the first and second oil price shocks, though this time around, preemptive tightening of monetary policy, as seen in timely measures taken in the Philippines and Thailand, should help contain inflationary impacts.

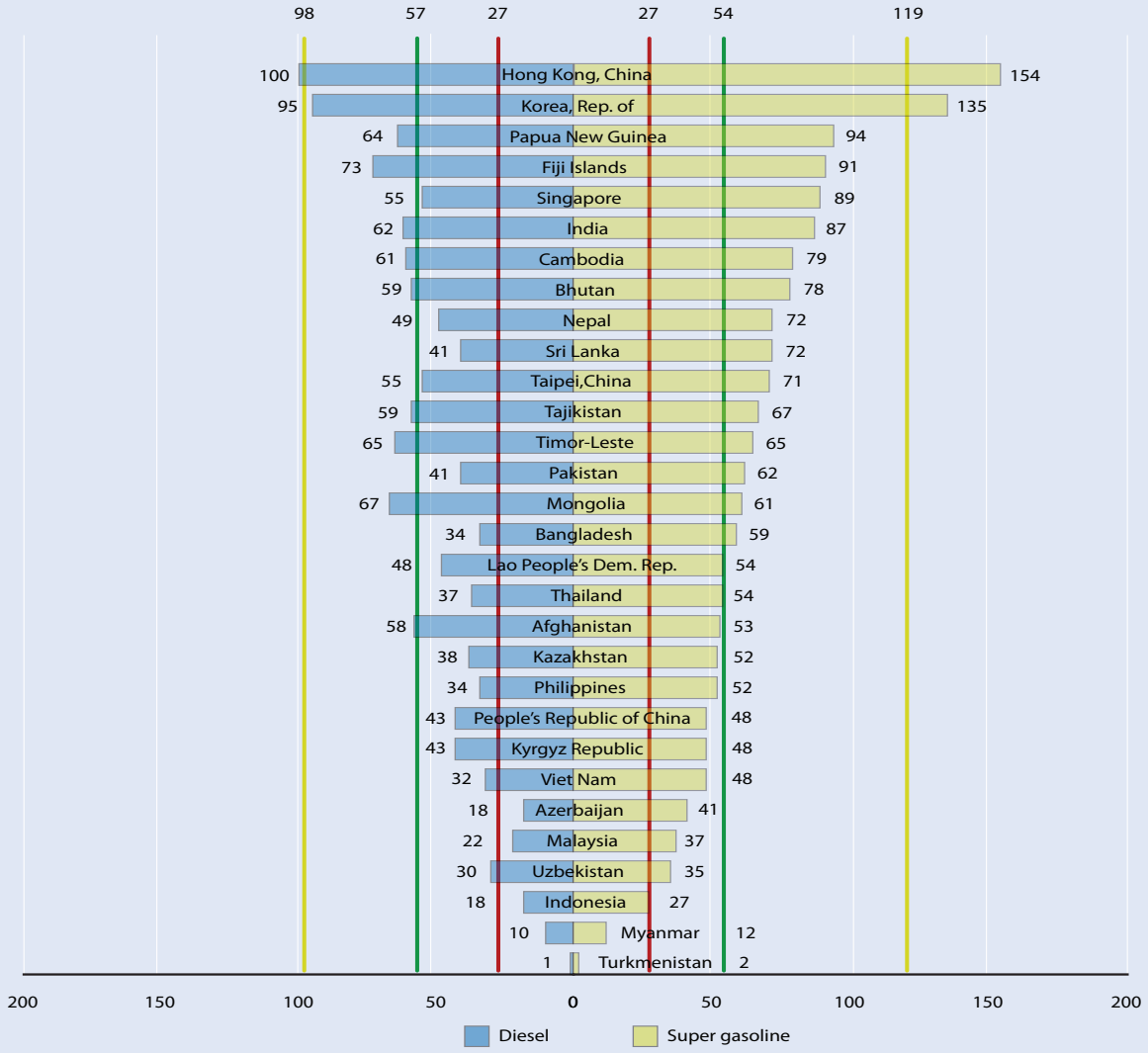
Fiscal policy can help buffer the output losses entailed by higher oil prices. Its role should be to assist in smooth adjustments and to provide a measure of temporary relief, but it cannot inoculate an economy against higher oil prices. Normally, fiscal stabilization should occur automatically. Any discretionary response should be limited, especially as it may be difficult later on to remove expenditure programs and subsidies or to restore oil taxation to previous levels if oil prices subsequently fall. Attempts to shield consumers and producers from the impact of higher oil prices through discretionary fiscal subsidies, as is happening in many countries, can have a high opportunity cost both in fiscal terms and in terms of broader efficiency considerations (see above). For countries whose initial fiscal position is weak, even automatic stabilization may prove difficult. If a larger deficit cannot be accommodated, adjustments will need to be more abrupt.

Those countries facing external payments difficulties will generally have less scope to

Box 3.4 Retail fuel prices in Asia

The box figure gives a snapshot of retail prices of super gasoline and diesel in November 2004 across a sample of 30 Asian developing countries. The data were compiled by German Technical Cooperation (GTZ). It shows three sets of colored vertical lines that define benchmark prices that broadly indicate national pricing policies for transportation fuels. The red lines (27 US cents per liter) indicate the cost per liter of crude oil, which was $43/bbl at that time. The green lines are the US prices (54 US cents per liter for gasoline and 57 US cents per liter for diesel) representing product prices determined in a competitive market with an efficient refining industry; the US prices include about 10 US cents per liter of taxation that was considered a reasonable dedicated tax standard needed for road or general transportation infrastructure. The yellow vertical lines indicate Luxembourg product prices representing the approximate

Box figure Comparison of retail fuel prices in Asia (as of November 2004, US cents per liter)



Retail fuel prices of Luxembourg = approx. minimum entrance level for 10 European Union accession countries.

Retail fuel prices in the United States = average cost-covering retail prices including industry margin, VAT, and approximately 10 US cents for the two road funds (federal and state). This fuel price, as it has no other specific fuel taxes, may be considered the international minimum benchmark for a nonsubsidized road transport policy.

Crude oil prices on the world market (Brent at Rotterdam).

Source: GTZ. 2005. International Fuel Prices, available: http://www.gtz.de/fuelprices.

Box 3.4 *(continued)*

minimum level for the 10 European Union accession countries. Only two economies—Hong Kong, China and Korea—priced around or above this benchmark.

For gasoline, the bulk of countries (18) charged the green line benchmark price or more while an additional six charged the green line price excluding taxes of 10 US cents per liter. Whether at the margin the green line prices would represent cost recovery in a country would depend on local circumstances, especially refining industry efficiency and national distribution costs. Only a small fraction of crude costs are covered in Turkmenistan and Myanmar while in November 2004 Indonesia's gasoline prices might just have covered crude costs. Uzbekistan, Malaysia, and Azerbaijan covered crude costs, but gasoline prices at that time appear to have been substantially subsidized. For diesel, five countries charged less than the indicative crude cost—Turkmenistan, Myanmar, Indonesia, Malaysia, and Azerbaijan. As with gasoline, all countries that did not recover crude costs were oil producers. It is notable that another 14 countries did not price to the green line standard, i.e., the bulk of countries provided subsidies for diesel.

Since November 2004, crude prices have risen considerably, but many of developing Asia's governments have not fully passed this through to retail prices. They have extensively relied on increases in direct subsidies, cuts in petroleum taxation, and losses by state-owned petroleum companies to avoid full price adjustment. Thus the very mixed picture for November in cost recovery in transportation fuel (including some minimal taxation) has likely been heavily clouded since then.

Across Asia, the most heavily subsidized oil products are not transportation fuels but products such as kerosene and LPG used by the poor, mainly for cooking. (However, data on the structure and magnitude of these subsidies are not readily available.) Kerosene, in particular, is heavily subsidized in many countries, since it often accounts for a significant part of poor households' expenditure. For example, in India and Nepal, kerosene absorbs about 2% of total household spending among the poorest urban households (UNDP/ESMAP 2005). If kerosene prices increased significantly, poor households in these countries and elsewhere would be at risk.

smooth out the negative impacts on prices and potential output, and are likely to face more difficult economic adjustments. In the absence of sufficient foreign reserves or external financing opportunities, a deteriorating trade balance must be accommodated by reductions in domestic consumption and investment. In such cases, a depreciating exchange rate will facilitate adjustments of domestic demand and will help move resources from the nontraded to the traded goods sector. However, in poor countries with large external debts, additional external financing assistance on a grant basis or on highly concessionary terms may be needed as a temporary measure to help fill payments gaps.

Higher oil prices also pose challenges to net oil exporters. Much will depend on the distribution of income gains, and whether the non-oil sector faces higher costs. In countries where oil revenues are narrowly concentrated, the overall impact of higher oil prices on aggregate demand may be negative, but where increased oil incomes spill over into the broader economy, private demand may expand and generate inflationary pressures. As a consequence of foreign exchange inflows, an appreciation of the real exchange rate is likely to follow, squeezing activity in the non-oil, traded goods sector—the so-called "Dutch disease."

Sterilized intervention may slow the process and help contain domestic inflation, but cannot stop it. If the increased oil income seems to be temporary, governments need to exercise caution about expanding expenditure programs. Even if the gains look like being more permanent, the authorities need a plan to use them over a medium- to long-term horizon, integrate them within a broader expenditure planning framework, and ensure that spending decisions pass standard tests that guard against waste.

Oil-exporting countries may also consider the benefits of making a precautionary reduction of their debts; of saving in oil stabilization funds held in foreign currency assets (to finance future development expenditures); and of targeting a non-oil fiscal deficit that would limit macroeconomic strain. These are some of the issues that the net oil exporters in Central Asia and Pacific, for example, will continue to grapple with.

Long-term responses

Asia needs energy, particularly power, to develop. The elimination of poverty and enhanced social development will depend critically on securing future supplies of energy and on ensuring that it supports investments in agriculture, basic health and sanitation, education, power, transport, and industry. For the foreseeable future, oil will remain one of—if not the—major source of energy for meeting these needs.

Over the long term, several factors will influence future oil dependency and energy efficiency in developing Asia. An important starting point is for national energy policies to make rational choices about the development of an appropriate energy mix. Such a framework needs to clearly set out strategies for ensuring efficiency in use and development, adequacy and reliability of supply, and measures to mitigate environmental impacts. Investor confidence in oil and other energy sectors benefits from a predictable and transparent framework to guide government decisions over the long run. An improved investor climate will in turn promote supply and help stabilize prices.

Within the broader framework of a national energy policy, a number of specific measures are likely to reduce susceptibility to the risks of high oil prices. However, on a broader view, promoting energy efficiency and diversity transcends the narrow boundaries of energy policy. Policies on competition and investment, transportation, technology, and even finance all have an important role to play—as well as, of course, energy pricing policies.

The development of competitive markets in oil and other energy products is also important. In many of the region's developing countries, the oil sector has long been dominated by inefficient state-owned entities. Inviting the private sector to participate in the oil and energy sector is likely to be beneficial but may require legal, institutional, and regulatory changes. Access to energy-efficient technologies and related know-how, which may be protected under intellectual property safeguards, may not be possible without market opening and foreign participation. In the past, heavy regulation of ownership has aggravated supply and capacity problems and has deterred investment.

Transport policy will play a major role in influencing future oil dependency and energy efficiency, since vehicles are the largest source of demand for oil in developing Asia, and vehicle ownership is set for explosive growth. For example, the PRC is set to become the world's second-largest automobile market within a decade. Decisions about investments in road and rail infrastructure, urban transportation systems, vehicle taxation, and user costs will all exert an important structural influence on demand for and dependence on oil. Here, too, competition should have a key role to play in making choices available to consumers and in helping ensure that resources are used efficiently. Where competition is not possible, the role of regulation should be to help mimic competitive outcomes. An important guiding principle should be that transport users, whatever the mode, should pay prices that fully internalize social costs.

There are of course many other areas where policies will have a long-term effect on oil dependency and energy efficiency. For example, failure in rural credit markets may impede investments by farmers in fuel-efficient methods for generating power. In some cases, it may make sense to subsidize or provide tax incentives for clean energy alternatives that generate significant external benefits in terms of health, time savings, or the reduced risks that follow from diversified energy sources. The case for carbon emission taxes is of course well understood and documented.

Another long-term response is illustrated in the buildup of strategic reserves of oil by the PRC and India. Strategic stocks are not intended to guard against high prices; their main objective is to ensure oil availability in the event of a physical disruption in supply. Early last year, the International Energy Agency (2004) estimated that the PRC had 35 days of crude oil reserves and that India had 15 days. Both countries have declared their intention to significantly increase strategic reserves and are investing in storage facilities. The Second ASEAN+3 Ministers Meeting on Energy, held on 13 July 2005, also affirmed the importance of strategic oil reserves as an important element of an overall "energy security" package. At this time, the ASEAN+3 Initiative aims to acquire oil stocks on a voluntary and commercial basis.

Conclusions

Although there remains some uncertainty about their future path, higher oil prices could be here to stay for some time. The run-up in prices that has occurred since March 2005 would appear to have a significant permanent component. Supply as well as demand pressures would now appear to be figuring more prominently in the market outlook. In this context, and with a view to its longer-run energy security and efficiency, developing Asia needs to reevaluate decisions that have been made in the belief that oil would remain cheap and that higher prices would be temporary.

First, fuel subsidies, artificially low prices, and low levels of taxation on oil products are widespread in developing Asia. The financial costs of these subsidies have escalated sharply and are now beginning to create fiscal strains. Those countries that are yet to begin removing subsidies may be able to draw useful lessons from the experiences of others, such as Thailand, that have moved quickly to dismantle them. The idea that subsidies benefit the poor most does not always square with the facts on the ground. Although subsidies may provide short-term relief from the pain of higher oil prices, they do so at high opportunity cost and at the risk of upsetting macroeconomic stability.

Second, few countries in the region adequately tax oil products. In most, excise taxes fall far below international benchmarks. Given the likelihood of an exponential increase in the demand for energy in the coming decades, and Asia's reliance on oil, taxes on oil products will have an important part to play in promoting sustainable energy use. The pain from higher taxation of oil products is more than likely to be compensated by greater energy efficiency, a more diversified energy mix, and a cleaner environment.

Third, there is a wide body of evidence to suggest that the right incentives—market incentives—will generally work best in influencing choices about oil and energy consumption. Regulation, where used, should have a "light touch" and be used to emulate market outcomes rather than supplant them. Recourse to direct administrative controls, such as those now being implemented in some countries, should be used with care. Administrative controls are often difficult to implement, can be easily evaded, create opportunities for rent seeking and corruption, and create significant efficiency losses. Besides, they often fail to curb consumption.

Fourth, for net oil importers, the appropriate macroeconomic response to higher oil prices is to fine-tune fiscal and monetary policy to accommodate, not resist, needed adjustments in output and prices. Fiscal accommodation should be largely automatic and should not attempt to compensate for negative output effects that are unavoidable. Monetary policy should lean against underlying inflationary pressures. Favorable initial conditions across much of developing Asia should mean that most economies can bear these adjustments without seriously jeopardizing growth.

Finally, for net oil exporters, higher prices will provide resources that can be used to accelerate development. But a measured approach is needed in which the use of oil revenues is planned within a medium- to long-term framework. To avoid the risks of developing a lopsided economic structure, care must also be taken to avoid a rapid and excessive appreciation of the real exchange rate that would divert resources out of non-oil, traded goods activity.

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Appendix table Share in final oil consumption, 2002, selected countries, by sector and by product (%)

Sector	Industry	Transport	Agriculture	Commerce and public services	Residential	Other nonspecified
Bangladesh	7.7	49.0	20.4	0.0	22.8	0.0
China, People's Rep. of	31.5	41.6	9.8	9.5	7.6	0.1
Hong Kong, China	12.5	82.8	0.0	4.4	0.3	0.0
India	35.2	38.7	0.0	0.0	25.9	0.2
Indonesia	21.6	50.8	4.2	0.8	22.6	0.0
Kazakhstan	39.3	42.1	7.1	1.0	0.0	10.5
Korea, Rep. of	42.0	39.1	3.9	8.5	5.2	1.3
Kyrgyz Republic	0.0	57.1	0.0	0.0	0.0	42.9
Malaysia	25.3	66.8	0.5	4.0	3.3	0.0
Myanmar	10.6	79.0	0.1	0.0	8.9	1.5
Nepal	4.3	40.8	8.9	9.2	36.9	0.0
Pakistan	14.5	76.9	1.8	1.8	5.1	0.0
Philippines	13.3	65.0	2.2	11.4	8.0	0.0
Singapore	38.8	45.4	0.0	0.0	0.0	15.8
Sri Lanka	13.5	70.9	0.3	1.8	4.2	9.2
Taipei,China	48.1	42.6	2.5	2.0	3.7	1.0
Tajikistan	0.0	89.8	0.0	0.0	0.0	10.2
Thailand	22.7	62.2	10.2	0.0	4.9	0.0
Turkmenistan	0.0	26.0	0.0	0.0	0.0	74.0
Uzbekistan	9.5	60.1	23.6	0.0	0.6	6.3
Viet Nam	23.2	57.3	4.5	10.0	5.0	0.0
Average	**31.4**	**46.3**	**5.4**	**5.3**	**10.4**	**1.3**

Product	Gas/Diesel	Motor gasoline	Liquefied petroleum gas	Kerosene	Aviation gasoline, Jet kerosene	Others[a]
Bangladesh	55.2	8.9	0.7	22.1	7.0	6.0
China, People's Rep. of	40.4	21.7	8.5	1.6	3.5	24.3
Hong Kong, China	41.8	5.1	4.8	0.4	48.0	0.0
India	40.0	9.1	10.1	12.5	2.7	25.5
Indonesia	40.0	22.9	1.9	21.5	2.9	10.9
Kazakhstan	38.0	32.2	10.3	0.2	2.6	16.7
Korea, Rep. of	23.4	9.4	9.5	9.5	4.2	44.1
Kyrgyz Republic	23.8	47.6	2.2	0.0	9.5	16.8
Malaysia	40.9	34.1	7.3	0.5	8.9	8.3
Myanmar	62.7	22.9	1.1	0.1	5.2	8.0
Nepal	36.6	7.1	8.3	40.0	6.2	1.8
Pakistan	64.3	9.9	3.4	2.8	7.6	12.0
Philippines	44.3	21.3	8.3	3.9	6.0	16.2
Singapore	12.0	6.6	2.1	0.5	26.8	51.9
Sri Lanka	55.6	10.9	6.0	8.8	8.1	10.6
Taipei,China	15.8	23.7	5.5	0.1	7.1	48.0
Tajikistan	6.7	89.4	0.5	0.0	0.4	3.0
Thailand	46.5	18.4	8.5	0.2	9.6	16.9
Turkmenistan	30.3	26.0	2.8	0.0	9.4	31.5
Uzbekistan	41.7	43.8	1.2	2.6	7.7	3.0
Viet Nam	43.6	24.4	5.3	4.7	3.3	18.6
Average	**36.8**	**17.9**	**7.6**	**6.2**	**5.5**	**25.9**

[a] Others consist mainly of residual fuel-oil and naphtha, and small amounts of crude oil and natural gas (predominantly used by industry).

Source: International Energy Agency, available: www.iea.org.