Background Paper Section II
For SPO “Greening of fuel taxes”

II-1. Conflicts over sudden fuel price change: Case of Indonesia (related to Section VI. Critical Instruments, “Step-by Step Approach”)

In Indonesia, between October 2000 and July 2002, gasoline prices were increased from a very low level, by about 75 per cent, due to reduction of the fuel subsidy. The fuel subsidy was reduced considerably, from U.S.$5 billion in 2000, however, it was still relatively large. Early in 2003, another price rise was implemented, influenced by a peak in international oil prices. This took place simultaneously with substantial telephone and electricity price rises.

This simultaneous price rise in basic utilities in 2003 faced a serious public protest across the country, while earlier protests against the fuel price rises had been muted and had dissipated within days. The government was eventually forced to set back the price rises to their earlier levels. Metschies (2003) concluded that one of the lessons from the Indonesian experience is that any effort to raise fuel prices from highly subsidised levels must be accompanied by an astute and ongoing awareness campaign.

II-2. Fuel contribution to total tax revenues (related to Section VI. Critical Instruments, “Allocation of tax revenues for development of sustainable transport”)

Fuel taxes are raising a significant amount of revenue in many countries. Compared to total tax revenues, contribution by fuel ranges from minus (means that fuel is subsidised) to 36 per cent as shown in Figure II-1. In the transport sector, fuel tax derives 80 per cent to 90 per cent of the sector revenues. The remaining 10 per cent to 20 per cent consist mainly of annual vehicle taxes, whereby small passenger vehicles naturally pay less than large trucks. According to past experience, the general magnitude of road-financing by fuel taxes is estimated to be about 10 US cents/litre of diesel and gasoline in industrialised countries such as the US. Allocation of surplus for sustainable transportation would be practically possible (Metschies 2003)
II-3. Examples of allocation of tax revenues for development of sustainable transport (related to Section VI. Critical Instruments, “Allocation of tax revenues for development of sustainable transport”)

In Germany, seven US cents/litre is reserved for covering the deficits of regionalised railways, and two US cents/litre is invested in solutions for urban traffic problems. In the US, the fuel-tax-fed highway trust fund is tapped for “surface transportation program”, “air quality improvement”, and “highway safety program” expenditures. In Bogotá, Columbia, a 20 per cent surcharge is collected
on all gasoline sales and 50 per cent of the revenues are used for the construction of the infrastructure required for the operation of the bus transit system called Trans Milenio. The United Kingdom once had a policy of increasing fuel taxes by 5 per cent per year as an energy conservation measure and TDM strategy although this policy was discontinued in response to resistance due to wholesale price increases, but the tax has not been reduced (Litman 2003a, Metschies, 2003).

II-4. Examples of tax differential for cleaner fuels (related to Section VI. Critical Instruments, “Setting tax rates favouring cleaner fuels”)

Tax differentials for cleaner diesel or gasoline are mostly found in Europe. Sweden introduced tax differentials for diesel on 1 January 1991 and for gasoline on 1 December 1994. Finland tax differential was implemented for gasoline on 1 January 1993 and for diesel on 1 July 1993. Although the tax differential charged is a fraction of the normal annual price fluctuation caused by world markets, the tax differentiation of gasoline and diesel qualities has been robust enough to ensure a rapid change of the market in both Sweden and Finland for both fuels (Arthur and Little 1998).

German fuel taxes rates are differentiated by the level of sulphur content as shown in Table II-1. Tax is levied on producers of fuel and oil products but tax incidence, however, is shared by supply and demand.

Table II-1: Fuel tax differentiation in Germany
(source: Breithaupt, 2002)

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<th>Gasoline (tax per litre)</th>
<th>Diesel (tax per litre)</th>
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<tr>
<td>High sulphur content (&gt; 50 mg per kg)</td>
<td>0.58 US$ (of which 0.11 US$ as eco tax)</td>
<td>0.42 US$ (of which 0.11 US$ as eco tax)</td>
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<tr>
<td>Low sulphur content (≤ 50 mg per kg)</td>
<td>0.56 US $ (of which 0.09 US$ as eco tax)</td>
<td>0.40 US$ (of which 0.09 US$ as eco tax)</td>
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In Denmark, a tax incentive for below 50 ppm sulphur was introduced by 0.09 DKK/litre and tax on 500 ppm was increased by 0.09 DKK in 1999 (Boyle et al., 2004).1

II-5. Impacts on fuel consumption and traffic volume (related to Section VII. a. Impacts on the driving forces for environmental degradations)

Various studies have conducted to identify the elasticities with respect to fuel prices to identify the impact of price change on the consumption of fuel and travel demand (Litman 2003b). Glaister and Graham (2000) summarised a survey of the world-wide scientific literature on the observed effects of changes in fuel prices and other factors on fuel consumption and on traffic levels. Figure 2 illustrates the different views about the magnitude of price elasticity effects on petrol consumption and private travel demand, showing average estimates of short and long run price elasticities of petrol consumption from various studies.

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1 One Danish Krone was 0.13900 US Dollar (conversion rate on 30 June 1999; this scheme was introduced in June 1999)
The findings of their paper can be summarised as follows:

(1) The short run effect on fuel use is relatively smaller than long run effect. Typically, short run elasticities are in the region of between -0.2 and -0.3 and the long run are between -0.6 and -0.8. This means that a 10 per cent fuel price increase is likely to reduce fuel consumption by 2 to 3 per cent in the short run, and by 6 to 8 per cent in the long run.

(2) It was found that the effects on traffic volumes tend to be less than their effects on the volume of fuel consumption. The short term elasticity of traffic with respect to price is about -0.15 and long term about -0.30. It indicates that motorists find ways of economising on their use of fuel, given time to adjust. Raising fuel prices appears to be more effective in reducing the quantity of fuel used than in reducing the volume of traffic.

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**References**


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2 Glaister and Graham define short run and long run as follows; a “short run” elasticity means the expected response soon after a change, and certainly within one year. A “long run” elasticity is the response after there has been ample time for individuals to make all the adjustments they will in response to the change. It may take decades for long run effects to work through in full, but most of the effects will occur within five to ten years.

