6. Challenging the impacts of fuel subsidies and taxation

Jacob TETER, Till BUNSEN
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• Motivations and consequences of fossil fuel subsidies

• Case: Prices, taxation and market regulation for transport fuels in EU4Energy countries

• Quantifying externalities from transport fuel use pricing policy design principles

• Case: Indonesia’s transport fuel subsidy reform
Motivations and consequences of fossil fuel subsidies
Defining fossil fuel subsidies

- Government actions that result in prices paid by end users being below the full cost of supply based on international benchmarks
  - Fuel: The gap between world fuel prices and domestic market prices

- Costs of subsidies for countries with net-imports vs. net-exports
  - Fiscal expenditure vs. opportunity costs of forgone export revenue

- Subsidies take many forms:
  - Price controls and direct financial transfers to producers
  - Transfer risks of private sector to government
  - Tax concessions for production or consumption
Value of fossil fuel subsidies world wide by fuel

Value of fossil fuel subsidies reach USD 493 bn in 2014
Oil products receive more than half of fossil fuel subsidies

Justification and motivations of energy subsidies

• Nikoloski (2012) reviewed the motivation behind 20 energy subsidy programs

• Alleviating (energy) poverty was the most common justification

• Protecting employment through patrimony resource sharing

• Environmental protection through subsidies targeted at specific fuel or technology

• Policy making influenced by lobbying

What are potential unintended effects of fossil fuel subsidies?

Unintended effects from market intervention reduce benefits of fuel subsidy policies

- Encourage wasteful consumption
- Hasten the decline of exports
- Threaten energy security by increasing imports
- Encourage fuel adulteration and smuggling
- Discourage investment in energy infrastructure
- Disproportionally benefit the middle class and rich
- Drain state budgets for importers
- Distort markets and create barriers to clean energy investment
- Dampen global-demand responsiveness to high prices
- Increase CO₂ emissions and exacerbate local pollution

Prices, taxation and market regulation for transport fuels

Case of EU4Energy countries
EU4Energy program: Scope and country characteristics

• Program by EU and IEA with regional focus on 11 countries in Caucasus, Eastern Europe and Central Asia
  - To support focus countries to implement sustainable energy policies and foster co-operative energy sector development at the regional level
  - Armenia, Azerbaijan, Belarus, Georgia, Kirgizstan, Kazakhstan, Tajikistan, Turkmenistan, Ukraine, Moldova, Uzbekistan

• Market regulations and retail fuel prices differ across EU4Energy countries
  - Influence of production capacity and pace of market reforms
Levels and changes for gasoline retail prices differ across EU4Energy countries and prices are low in international comparison.

Source: GIZ International Fuel Prices, 2017
Diesel has lower retail prices and larger price fluctuations than gasoline

Source: GIZ International Fuel Prices, 2017
Excise taxes for transport fuels are low in EU4Energy countries. Excise taxes in Armenia and Kazakhstan are negligible.

Source: EU4Energy country expert submissions, EnergieStG
## EU4Energy countries: Examples for price regulations

<table>
<thead>
<tr>
<th>Market-based transport fuel prices</th>
<th>Regulated transport fuel prices</th>
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<tbody>
<tr>
<td><strong>Kazakhstan</strong></td>
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<td>Deregulated market as of 2015</td>
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<td><strong>Ukraine</strong></td>
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<tr>
<td>No price regulation, committed to gradually introduce EC Directive 2003/96/EC on taxation of energy products</td>
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<td><strong>Georgia</strong></td>
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<td>Liberalized market with free market entry and no price regulation</td>
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<td><strong>Belarus</strong></td>
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<td>Price regulation by State Company for Oil and Chemistry (BelNeftekhim)</td>
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<td><strong>Moldova</strong></td>
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<td>National Agency for Energy Regulation (ANRE) caps retail prices based on stock exchange prices</td>
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<td><strong>Turkmenistan</strong></td>
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<td>Price regulation with very low retail prices</td>
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</tbody>
</table>
Quantifying externalities from transport fuel use pricing policy design principles
Getting prices right for transport (Internalising externalities)

I. **Local Air Pollution** – Charges should be levied on fuels used in power generation, heating, and by other stationary sources in proportion to the local air pollution emissions from these fuels but with credits for demonstrated emissions capture during fuel combustion.

II. **Road vehicle impacts** – Additional charges for local air pollution, congestion, accidents, and pavement damage attributable to motor vehicles.
   - *Ideally*, these charges should reflect real-time, actual damages (which depend on location and time)
   - A good *proxy* is to link charges to distance driven (i.e. vkm or distance-based pricing)
   - Reflecting costs in motor fuel taxes is the appropriate first step until technologies and data collection enable the above two approaches

III. **Climate (Greenhouse Gases)** – A charge should be levied on fossil fuels in proportion to their CO₂ emissions multiplied by the global damage from those emissions.

* The concepts behind ‘Getting Energy Prices Right’ are simple
* In practice, estimating the magnitude of these external costs is quite difficult
* Moreover, there may be political or practical reasons for energy taxes to be different from the ideal, and for policy makers to prefer regulations over fiscal policies
* Nevertheless, quantitative estimates of economic, environmental, and health impacts are a useful first step
Getting energy prices right: policy design

Goals:

• **Effective** – by incentivizing all actors toward a common goal
• **Cost-effective** – by aligning marginal costs across all sectors and actors
• **Balance** economic growth with environmental, safety, health impacts – by aligning marginal costs with marginal damages

Policy design principles:

• **Target the right base** – example of health impacts of local pollution
• **Exploit the fiscal dividend**
  • *Be wary of earmarking*
  • *Compensate appropriately* (trade-off between equity & effectiveness)
  • *Consider compensation schemes that improve economic efficiency*
• **Establish stable prices aligned to environmental damage**

Fiscal policies must be designed with care, balancing design principles with practical considerations and political feasibility
Pigovian taxes as a ‘first-best’ policy – example of CO₂ pricing

Illustrative Sources of fuel CO₂ reduction from various policies

<table>
<thead>
<tr>
<th>Policy instrument</th>
<th>Power generation</th>
<th>Transportation</th>
<th>Homes and industry</th>
<th>Emissions reduction relative to carbon tax</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Shift to renewables</td>
<td>Other reductions in emissions intensity</td>
<td>Reduced electricity use</td>
<td>Higher efficiency</td>
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<tr>
<td>(1) Carbon tax</td>
<td></td>
<td></td>
<td>Higher efficiency</td>
<td>Reduced product use</td>
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<td>(2) Renewables subsidy</td>
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<td>(3) Efficiency standards for buildings, appliances, and others</td>
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<td>(4) CO₂ per kWh standard</td>
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<td>(5) Vehicle fuel efficiency standard</td>
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<td>(6) Combination of (3), (4), (5)</td>
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<td>(7) Electricity tax</td>
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<td>(8) Motor fuel tax</td>
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<td>(9) Simple vehicle ownership tax</td>
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Sources: Based approximately on analyses for the United States in Krupnick and others (2010) and Parry, Evans, and Oates (2014). Note: Light-gray bars indicate emissions reductions induced by different policies; policies are scaled (when applicable) to have the same effect, for example, on fuel efficiency and electricity demand, as a carbon tax. Dark gray bars indicate sources of increased emissions because lower per unit energy costs increase demand for energy-using products (the rebound effect).

Source: “Getting Energy Prices Right” IMF, 2014

In theory, pricing mechanisms are superior to regulations, both in terms of effectiveness and cost-effectiveness.
The most tractable solution: motor fuel taxation

\[
[\text{CO}_2 \text{ damage per liter}] \\
+ \\
[\text{local pollution damage per liter}] \quad \text{NO}_x, \ PM_{2.5}, \ CO, \ HC... \\
+ \\
[\text{(congestion and accident costs imposed on others per extra kilometer of driving)}] \\
\times \\
(\text{kilometers per liter}) \\
\times \\
(\text{fraction of the fuel reduction resulting from reduced driving rather than from higher fuel efficiency})
\]

- Calculating the appropriate taxation level is relatively straightforward
- But there are potentially unintended consequences...
Key findings:

Higher taxes on motor fuels are warranted in many countries, though more to reflect the costs of traffic congestion and accidents than carbon emissions and local air pollution. Corrective gasoline taxes are about $0.40/liter (about $1.50/gallon) or more in 17 of the 20 countries illustrated.

The main challenge is how to get it done—how to build support for energy price reform. International organizations and others have an important role to play, first in promoting dialogue about best practice, and second in providing solid analytical contributions quantifying the benefits of pricing policies relative to alternative approaches, and assessing distributional implications to inform the design of compensating measures.
Case 1: Mexico’s fuel price reform policies
Case 2: Indonesia’s transport fuel subsidy reform
Case study Indonesia

Gasoline and diesel pump prices in Indonesia and spot prices in Singapore

Transport fuel retail prices in Indonesia understate international price benchmark
Case study Indonesia

Fossil fuel subsidies and their components in Indonesia, 2005-16

Source: Indonesian Ministry of Finance, 2016

APBN: Actual State Budget Plan after spending

Annual expenditure decreased from USD 19.3 bn in 2014 to USD 5 bn in 2016 under Indonesia’s fossil fuel subsidy reform
Case study Indonesia

- Gradual reform of transport fuel subsidy policy to remove subsidies
- Subsidy reform accompanied by targeted cash transfers and publicity campaign
- Decline of oil prices buffered increase of transport fuel prices
- Broad budget reallocation to rural infrastructure programs, HSR project, health care, and state owned enterprises

<table>
<thead>
<tr>
<th>Year</th>
<th>Diesel</th>
<th>Gasoline</th>
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</thead>
<tbody>
<tr>
<td>2013</td>
<td>One-off price increase averaging 40%</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>Price increase by 31%</td>
<td>Price increase by 36%</td>
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<tr>
<td>2015</td>
<td></td>
<td>Removal of subsidy</td>
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<tr>
<td>2016</td>
<td>Removal of subsidy</td>
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</tbody>
</table>

Source: Beaton and Lontoh (2010), Lessons Learned from Indonesia’s Attempts to Reform Fossil-Fuel Subsidies
Takeaway messages
Takeaway messages

• Transport fuel subsidies take many forms and distort markets
  - Range from direct subsidy to fuel price regulation

• Subsidy programs often are ineffective in reaching desired outcome
  - Unintended effects reduce potential benefits, policy design is prone to lobbying

• Fuel taxation often falls short of internalizing negative externalities of road transport
  - time/location dependent pricing may be more effective

• Fuel price reforms can alleviate market distortion and make available budget for alternative spending programs
  - Subsidize people, not things
Supplemental slides
Please discuss these questions with your country tables:

• Focusing on transport (including fuel supply, energy security and diversification, contribution to economic activity, and impacts on health and the environment), what are the key externalities, market failures, and areas for improvement in transport service in your country?

• How would you redesign the taxation or subsidy policies for transport fuels in your country? Which of the above issues could be addressed by altering the policies? Which issues are left unaddressed, and how would you propose to address these?

• Who are the impacted groups of such fiscal policy redesign and how are they impacted?

• What are the potential trade-offs or adverse impacts of changing the taxation of transport fuels in your country?

• How would you pitch such policy to political decision makers of your country?

• What advice would you give political decision makers in advocating such policy to the general public? How would they address the concerns of adversely impacted groups?
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