GSI Global Subsidies Initiative

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A GUIDEBOOK TO FOSSIL-FUEL SUBSIDY REFORM

FOR POLICY-MAKERS IN SOUTHEAST ASIA

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About GSI

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ACRONYMS AND ABBREVIATIONS

APBN	Anggaran Pendapatan dan Belanja Negara (Indonesian state budget)
APEC	Asia-Pacific Economic Cooperation
ASCM	Agreement on Subsidies and Countervailing Measures
BFP	Basic Fuels Price
CGE	computable general equilibrium
DPR	Indonesian Parliament
EPPO	Energy Policy Planning Office (Thailand)
ERB	Energy Regulatory Board (Philippines)
GDP	gross domestic product
GHG	greenhouse gas
GIZ	German Agency for International Cooperation
GSI	Global Subsidies Initiative
IBT	Incremental Block Tariff
IEA	International Energy Agency
I-O	input-output
IMF	International Monetary Fund
IRC	Independent Review Committee
LPG	liquid petroleum gasoline
MDB	multilateral development banks
MoF	Ministry of Finance
NDRC	National Development and Reform Commission
NGV	natural gas vehicle
OECD	Organisation for Economic Co-operation and Development
OPSF	Oil Price Stabilization Fund
PEMANDU	Performance Management & Delivery Unit (Malaysia)
PSIA	Poverty and Social Impact Assessment
SAM	social accounting matrix
UNDP	United Nations Development Programme

EXECUTIVE SUMMARY: A GUIDE TO FOSSIL-FUEL SUBSIDY REFORM

Purpose of this Guide

There is no one-size-fits-all strategy for fossil-fuel subsidy reform—but there are a set of planning stages that are generic, along with many common issues, challenges and potential solutions. The purpose of this guide is to advise countries on the **process** for formulating an effective reform strategy that will fit their individual objectives and circumstances. It is aimed at policy-makers who have committed to reform and are exploring "how?" It is intended to have particular relevance for policy-makers in Southeast Asia, but much of its guidance could apply to any region. Its scope includes all subsidies that reduce the price of fossil fuels for consumers, with a special focus on petroleum products. It does not include guidance on subsidies for other types of energy (such as renewable electricity, biofuels or nuclear power) or for producers of fossil fuels. For research on these issues, see the GSI website: www.iisd.org/gsi.

Key Messages

In reviewing international experience with fossil-fuel subsidy reform, one message stands out above all others: be prepared. This may seem obvious. But all too often countries implement reform because of a sudden crisis or opportunity, and find themselves missing the internal coordination and research and external support that would allow for effective and decisive change. Preparation is essential.

Fossil-fuel subsidies are usually a long-term, structural problem—and they need structural solutions. Many countries formulate effective plans to reduce one subsidy but neglect the broader problem. Why do fossil-fuel subsidies exist and how can they be permanently removed? Reform can be thought of as one step in a larger transition from a basic, inefficient economic and social assistance system, to a more strategic, targeted and sophisticated one. If reform is not pursued within this larger context, subsidies can return again and again, driven by the same forces that caused them in the first place.

Politics matter. The biggest barrier to reform in most countries is political, so building support is vital. This includes efforts to improve credibility and trust in government. Strategies are available to help reform be understood and accepted by the general public, while allowing government officials to remain politically neutral. Strong leadership from heads of government and ministers is often required.

Articulate a positive objective. Reform should not be the *goal*. People are not inspired by dry, economic ideas like fossil-fuel subsidy reform. They want to achieve things that will improve their lives in tangible, meaningful ways. Reform should be the *means* by which concrete social and economic improvements are achieved. These improvements can be clearly articulated and targeted by reform plans.

Governments have developed a great deal of good practice in preparing for fossil-fuel subsidy reform—but are often unaware of one another's innovations. This guide draws together this experience. It provides guidance on **the pacing of reform**. It also identifies good practice across three core elements that should form part of any reform plan:

- **Getting the prices right**: how to change pricing systems for fossil fuels
- **Managing impacts**: estimating effects of reform and mitigating unwanted impacts
- **Building support**: internal organization and external consultation and communication

Pacing: A Gradual Approach or a "Big Bang"?

A strategy to raise subsidized fossil-fuel prices is often categorized in one of two approaches: gradual or "big bang." What this means depends on how these approaches are defined. There are two main ways reform can range from a more "gradual" pace to a more sudden "big bang":

- The size and frequency of the price increases
- The proportion of consumers who will no longer be eligible for subsidies

The GSI recommends a gradual approach where possible (pp. 27-28). The key advantage is that this allows strategies to adapt based on the outcome of each successive subsidy reduction. However, there are pros and cons to each approach, and the GSI recognizes that countries with very large subsidies or intractable political opposition may have no choice but to plan large reforms. The features of "gradual" and "big bang" reform—summarized in Table ES1—should be reviewed in determining the approach in any given country. Case studies suggest that **a fast move to market-based pricing is more likely to succeed if it is part of much bigger political and economic transformations**.

If several fossil fuels are being subsidized, the GSI recommends reforming them one by one, starting with the most regressive (pp.36 & 47). Gasoline, for example, is typically most important to high-income consumers, who can absorb the shock of a "big bang." Fuels that are important to low-income households—such as kerosene or fuels that contribute to low electricity prices—often require a slower pace. **It is not, however, recommended to leave a long gap between reforming subsidies for different fuels.** Large price differentials can cause new and damaging economic distortions of their own.

There are good times to reform (p. 28). The most advantageous timing is usually to change a subsidy mechanism when market-based fossil-fuel prices are falling. This is particularly true for "big bang" reform, as price shocks are minimized. Aiming for periods of relative political "good will," such as post-election or at seasonal periods when living costs are lower, can also be effective.

TABLE ES1 | COMPARISON OF "BIG BANG" AND GRADUAL TIMING APPROACHES

Performance criteria	Gradual	"Big bang"
Macroeconomic		
Reduction of costs	Gradual	Instantaneous
Impact on inflation and GDP	Low with each price increase, but risk of creating long-term expectations of inflation—"anticipatory inflation."	High, but over a short period.
Microeconomic and social		
Negative social impacts on households and businesses	Low to moderate. Easy to manage by adapting reform plan. Households and businesses have longer to adjust.	High. May lack capacity to promptly change reform strategy. No time for households and businesses to adjust.
Political		
Added risk of political instability	Low, but gives opposition time to organize against reforms.	High.
Use of political capital	High. Each price increase requires political capital. Increases risk of deferrals.	Medium. Only one price increase, but at the cost of a large economic shock.
Administrative		
Added risk of poorly designed reform strategy	Low to moderate. Actual impacts can feed into subsequent plans.	High. It is difficult to predict the impact of large economic shocks.
Added risk of poor implementation	Low. Allows for ongoing adjustment of reform strategy.	High. Requires very good projections of impacts and preparations.
Energy markets		
Reduced energy demand	Gradual	Instantaneous
Added risk of hoarding	High. Varies if schedule of price increases is known in advance.	Low. Varies if date of price increase is known in advance.

The Core Elements: Pricing, Managing Impacts and Building Support

1. Getting the Prices Right

Subsidies do not reduce the cost of energy, they just move it onto the population in a different way (p. 22). Someone still pays—but through taxes, foregone expenditure, foregone revenue or lack of investment in energy infrastructure. And the inefficiency of subsidies actually increases the cost burden on society. There is only one way to truly reduce fossil energy prices: by focusing on the fundamentals of supply and demand.

Raising prices on an ad hoc basis is not enough. Good fossil energy pricing consists of two components:

1. **Market-based prices** for fossil fuels
2. Creating and enforcing a **competitive and efficient** fossil energy market

Petroleum product pricing mechanisms can vary along four dimensions, summarized in Table ES2. **The GSI recommends that a good pricing mechanism should: involve no subsidies, fully and automatically reflect international price fluctuations, be fully transparent and be well enforced** (pp. 24-26).

TABLE ES2 | DIMENSIONS OF PETROLEUM PRODUCT PRICING MECHANISMS

	Good practice
1. **Subsidies**: degree to which subsidies reduce the end-price of fossil fuels by shifting costs onto the government, energy companies or other actors	No subsidies
2. **Pass-through**: degree to which domestic pricing fluctuations match international price changes	Full and automatic pass-through
3. **Transparency**: degree to which composition and regulation of energy prices is open and transparent	Fully transparent
4. **Enforcement**: degree to which fuel pricing in real life actually follows officially adopted energy pricing arrangements	Full enforcement

Few countries succeed in an overnight change to market-based prices (p. 28). Instead, most transition through one or more intermediate pricing policies intended to smooth price fluctuations. This helps households and businesses get used to price volatility. It also helps dissociate price changes from government decision-making. Generally speaking, **a formula-based automatic pricing mechanism seems to be a useful bridge towards market-based pricing** (pp. 30-33). It allows for an immediate transition to full transparency and a controlled transition towards no subsidies and domestic prices that fully reflect international price fluctuations. By contrast, **price stabilization funds often end up overspending when prices are high and undertaxing when prices are low—essentially subsidizing fossil fuels once again** (pp. 29 & 36-37).

Countries should look at options to reduce prices that focus on the fundamentals of energy supply and demand (p. 23). A fundamental part of this picture is the **promotion of intense competition** in a market with a level playing field. Other avenues for reducing energy costs might include: improved efficiency of distribution channels; incentivizing the exploration and exploitation of new, non-exportable energy sources; reducing wasteful energy consumption; the installation of efficient and competitive energy-producing capacity within national borders; and better enforcement of anti-collusion rules.

2. Managing Impacts

Improved economic, social and environmental prosperity is the entire rationale for reform—but within the larger picture of overall gains, there may be unwanted negative impacts (pp. 45-47). Poor and vulnerable groups may struggle to cope with the increased cost of living and doing business. Rising prices also mean rising inflation. And reforms can affect energy access and the types of energy that people use, with social and environmental consequences.

The first step in managing impacts is to estimate impacts (pp. 43-53). This allows unwanted consequences to be identified and mitigation measures designed. **It is important to estimate both direct *and* indirect impacts**, as indirect impacts are often large (p. 49). Where governments have resources, time and good data, **the GSI recommends a comprehensive analysis, including simple static analysis of direct impacts, assessment of indirect and induced impacts and a full dynamic macroeconomic analysis that estimates feedback throughout an economy.** Where resources, time and data are limited, the GSI recommends that, **as a minimum, it is good practice to conduct a Poverty and Social Impact Assessment and review literature on past and projected reforms**. Generally, **a mix of quantitative and qualitative methods is advised**, as statistical modelling will not capture all impacts.

Where possible, involve stakeholders in estimating impacts and choosing mitigation measures (pp. 55 & 74-77). This ensures that reform plans draw on stakeholder knowledge and respond to their concerns. It also raises awareness and creates stakeholder buy-in. There may be practical limits to the extent of stakeholder inclusion in countries where reform is particularly controversial and divisive.

Mitigation measures fall into three broad categories: how reform is implemented, responses to impacts and efforts to counteract price rises (pp. 54-55). Specific measures will be spread differently over time. Some forms of social and economic assistance will need to be short term only, phased out following an initial price shock. Others might represent a permanent alternative to subsidization and be ongoing. The precise mix of measures that are adopted will usually reflect a mixture of technocratic concerns, stakeholder preferences and what is politically possible. See the end of this Executive Summary for a checklist of impacts and mitigation measures often associated with fossil-fuel subsidy reform.

FIGURE ES1 | TYPES OF MITIGATION MEASURES FOR FOSSIL-FUEL SUBSIDY REFORM

Build credibility concerns into the design of mitigation measures (p. 55). Stakeholders may view plans skeptically, particularly if accountability and transparency are thought to be poor. Transparent preparation and the pre-emptive introduction of mitigation measures—before price rises take place—can build trust.

Accentuate the positive. Managing impacts should not become a negative story. Once mitigation measures have been designed, it should be possible to re-estimate the impacts of reform and show clearly and convincingly how it is in the interests of the majority, and will not harm the poor and vulnerable.

3. Building Support

Building support is about creating the political space that makes reform possible.

Subsidy reform can have far-reaching impacts and therefore requires a whole-of-government approach (pp. 68-69). A wide range of government portfolios, authorities and jurisdictions will hold information relevant to reform and have a legitimate interest in the process. Involving these bodies from the outset will increase the strength of the reform strategy and ensure the government speaks with one voice, despite the possibility of divergent views internally. **Internal coordination is a vital first step**.

Good communicators listen before talking (pp. 74-77). Effective reform plans are founded on an understanding of how stakeholders perceive reform and the options for change. Where resources and political sensitivities allow, **the GSI holds good practice to be consultation that engages with and responds to stakeholders directly, including public inquiries, roadshows, discussion groups and workshops**. Though resource-intensive, this helps build the legitimacy of reform plans and ensures they are well-informed. Tools such as survey research and web-based forums are also effective, though place less emphasis on interaction. Where resources are low or political sensitivity is high, **the GSI advises at a minimum that governments should gauge stakeholder views by systematically reviewing literature and media reports and talking with energy experts and stakeholder representatives**.

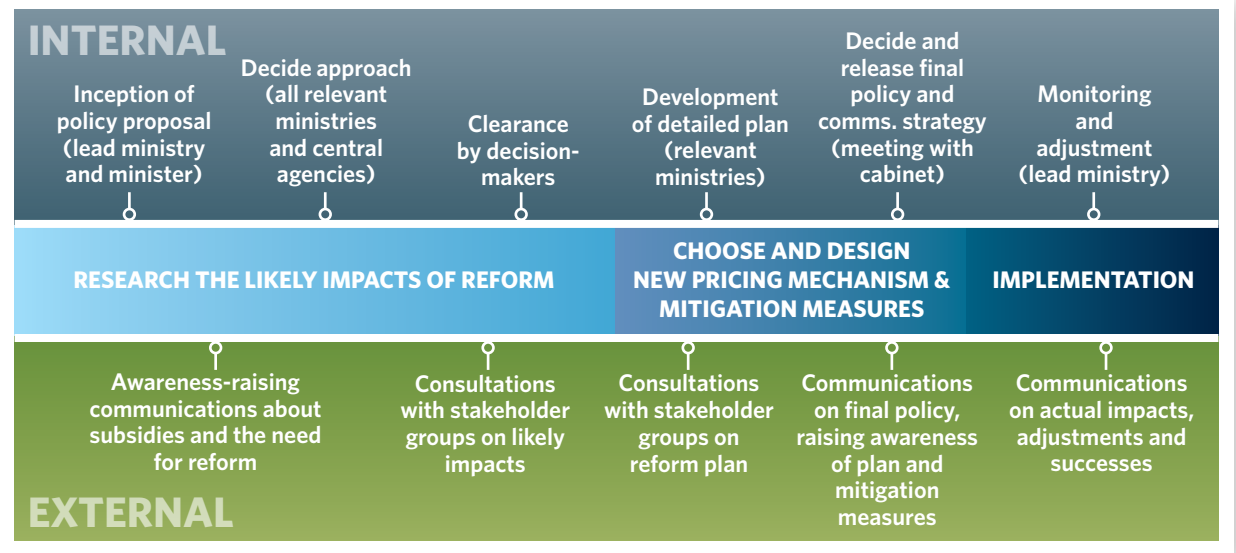
Good communications focus on simple and varied messages, targeted at specific stakeholder groups (pp. 78-82). Messages can be framed in different ways, as problems or opportunities. In many cases, a narrative of change will combine both. Messages drawn from country case studies are summarized in Table ES3. **Communications should use media that will best reach their target audiences** (pp. 83-85). This might include political announcements, radio, television, newspapers, leaflets, debates and websites. Some governments have used "no subsidy" days and published subsidy costs at retailers and on energy bills.

TABLE ES3 | NEGATIVE AND POSITIVE COMMUNICATIONS MESSAGES ABOUT FOSSIL-FUEL SUBSIDY REFORM

	Raise awareness of subsidy problems	Neutralize opposition	Raise awareness of gains from reform	Raise awareness of reform plans
Example focus of messages	Costs, inefficiencies, comparison with other countries, impacts on the poor and the environment.	Identifying smuggling and corruption, countering misconceptions.	Savings, target aid to the poor, more social spending, better standard of living.	Explaining reforms and mitigation, showing relevance to stakeholder needs, noting successes.

Measures to build support will be most effective if they are integrated throughout the reform process (pp. 66-67). This means that internal organization, consultation and communication are not something that happens at the "end" of planning (see Figure ES2 below).

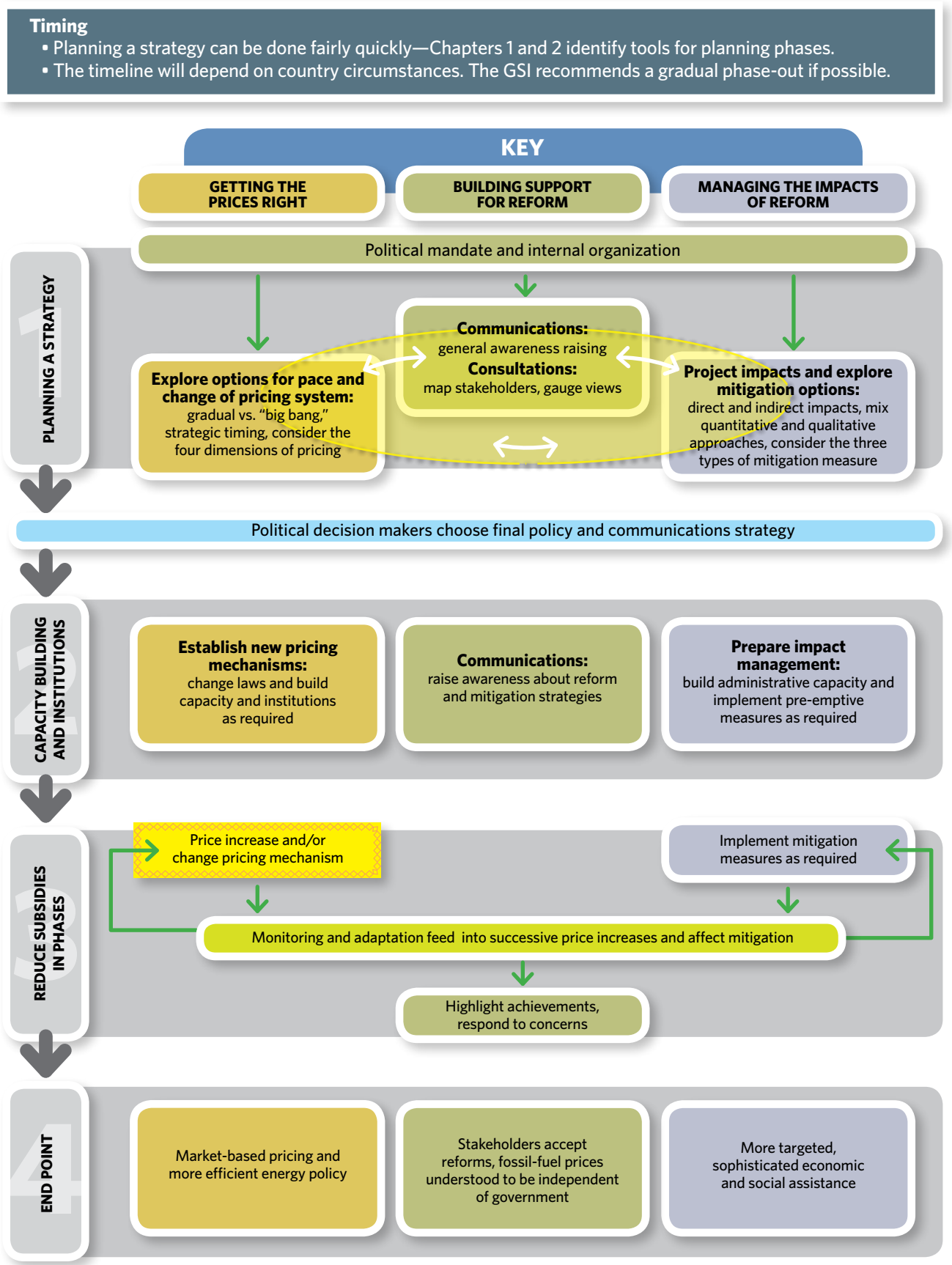
FIGURE ES2 | MODEL POLICY CYCLE SHOWING STRATEGIC POINTS FOR INTERNAL AND EXTERNAL SUPPORT BUILDING



The Big Picture: A Holistic Approach to Reform

Plans for fossil-fuel subsidy reform should be approached holistically. This guide sets out three core elements that should form a part of any plan—but, in reality, each is not discrete from one another, and all three must be combined into one single process. The interconnectedness of an ideal reform process is illustrated below.

FIGURE ES3 | THE INTERCONNECTIONS IN AN IDEAL REFORM PROCESS



Implications for Southeast Asia

Southeast Asian countries have a wealth of experience in reducing and reforming fossil-fuel subsidies, but most are still struggling to find long-term solutions. Policy dialogues and the publication of case studies would help replicate the successes and share lessons learned.

Key challenges in every country have included mitigating the negative impacts of reform and building support for reform. Many countries lack good alternatives to subsidization and are concerned about how to manage the inflationary impacts of price increases. High political resistance has made planning very politically sensitive in most countries, from conducting adequate consultations with affected groups to passing reform through parliamentary processes. Technical research, better administrative capacity and improved communications would go a long way to improving the chances of success.

Country needs differ greatly, depending on starting points and background circumstances. The Philippines, for example, is well on the way to market-based pricing, with the only price intervention being preferential taxes for some petroleum products and a few targeted compensation schemes aimed at the transport sector. Meanwhile, Indonesia has low, government-set fuel prices and Thailand has price caps on petroleum products. Malaysia has established a comprehensive subsidy rationalization plan, but, due to political sensitivity, has not made it public and has kept fuel prices frozen since 2010. In Vietnam, fuel subsidies must be tackled amid broader reforms of the electricity sector and state-owned enterprises.

With good preparation, change is possible, and good opportunities will arise. These opportunities might be external factors, such as when international oil prices are falling or are high enough to cause serious fiscal pressure. They could also be internal, such as the pressure of failing energy infrastructure, good will following an election or dwindling national energy reserves. **Having a roadmap in place allows for an effective and decisive transition to more effective fossil-fuel pricing, with mitigation measures ready to roll-out and a strong public awareness about subsidies and the benefits of reform.**

THOUGHTS AND FEEDBACK

The Global Subsidies Initiative (GSI) of the International Institute for Sustainable Development is an entirely independent, research-driven initiative that investigates how subsidies contribute to or undermine sustainable development. Where subsidies are found to be perverse, the GSI aims to bring about transformative change in the implementation of subsidy reform, through technical analysis, policy dialogues and communication with stakeholders.

The policy advice in this publication represents the accumulation of knowledge built up by the GSI over the course of more than five years of research on fossil-fuel subsidies. It also draws on discussions with Southeast Asian policy-makers at an IISD-GSI forum on this issue in November 2012: http://www.iisd.org/gsi/news/iisd-gsi-forum-south-east-asia

This guide is intended to be a living document that is updated as the GSI's research program continues to develop. All thoughts and feedback are highly welcome and should be directed to info@globalsubsidies.org

TABLE ES4 | ASSUMING NO MITIGATION: COMMON NEGATIVE AND POSITIVE IMPACTS OF SUBSIDY REFORM

Negative		Positive
Fiscal		
		Positive • Reduced expenditure, more "fiscal space" • Debt reduction • Higher income for state energy companies
Macroeconomic		
Negative		**Positive** • Fiscal savings • Better trade balance and current account
• Short-term shock to GDP	...but →	• Higher GDP growth in medium term
• Short- or medium-term rise in inflation	...but →	• Prices fall by the medium term
• Increased vulnerability to volatility	...but →	• Decreased demand for fuels
Governance		
Negative • Risk of anti-competitive practices and insufficient competition in new fuel pricing market		**Positive** • Increased energy security: decreased demand and more incentives for investment • Reduced opportunities for corruption • Reduced incentive for fuel smuggling
Businesses and economic sectors		
Negative • Reduced international competitiveness of fuel-consuming sectors, e.g.: – Agriculture and fisheries – Energy-intensive industries – Transport services		**Positive** • More stable energy supply, due to: – More level playing field – Improved finances of energy companies – Increased incentive to invest in energy production and infrastructure – Better incentives for energy efficiency
Households and social welfare		
Negative • Overall regressive impact, if most subsidy benefits previously went to poor • Reduction in household incomes • Unemployment associated with affected business sectors • Increase in poverty • Risk of reduced energy access	...OR...	**Positive** • Overall progressive impact, if most subsidy benefits previously went to rich
Environment		
Negative • Increased greenhouse gas emissions, assuming fuel-switching to more polluting fuels, despite efficiency improvements	...OR...	**Positive** • Reduced greenhouse gas emissions, assuming fuel-switching to less polluting fuels and energy efficiency improvements
• Increased local air pollution, assuming switch to more polluting fuels	...OR...	• Reduced local air pollution, assuming switch to less polluting fuels
• Increased pressure on forest resources, assuming switch to biomass		• Increased use of renewable energy as it becomes more competitive

TABLE ES5 | COMMON MITIGATION MEASURES: ADDRESSING UNWANTED IMPACTS OF REFORM

Mechanism	Desired impact
Fiscal	
• Redirect a proportion of subsidy savings into measures that can mitigate impacts	• Depends on focus of expenditure: see examples below
Macroeconomic	
• Gradual phase-out approach • "Big bang" reform approach • Temporary reduction in fees and taxes on fuel • Reform during periods of low seasonal inflation • Fuel price stabilization mechanisms	• Dampens GDP and inflationary shock • High shock but reduces risk of anticipatory inflation • Counteracts price increase, dampens inflation • Minimizes absolute level of inflation after reform • Smoothens volatility
Governance	
• Introduce or strengthen competition law	• Drives down market-based prices, no cartel pricing
Businesses and economic sectors	
• Gradual phase-out • Relax other price controls (e.g., food, transport) • Short-term compensation for key sectors • Support energy-efficiency audits • Extend and increase access to credit facilities, favourable loans, micro-credit schemes	• Industries can adapt, less shock for exporting sectors • Lets producers pass on price increases to consumers • Helps cope with price increase, gives time to adapt • Help identify energy efficiency opportunities • Helps businesses spread shock over a longer period or pay for energy efficiency investments
Households and social welfare	
• Increase budgets of agencies or funds with purview over social assistance and energy access • Health and education assistance (e.g., facilities and programs, supplies, improve access) • Infrastructure programs (e.g., expand electrification, invest in energy access, water purification centres, water distribution, build or improve roads, expand public transport, etc.) • Welfare transfers: increase non-taxable income, minimum wage, cash transfers (conditional and unconditional), in-kind transfers (food, water, etc.), subsidize certain socially important goods	• Addresses social impacts using existing capacity, scales up existing mechanisms • Lowers living cost; improves health-related welfare and economic prospects in medium to long term • Improves welfare by: i) increasing access and reducing costs of other goods or services; ii) promoting general economic prosperity, related to infrastructure; and iii) providing employment associated with construction. • Reduces impacts on cost of living by supplementing household incomes with cash (directly or indirectly) or other goods, or by lowering the costs of other goods.
Environment	
• Invest in enforcement of existing regulations • Programs to foster sustainable fuel wood • Investments in clean energy technologies and applications	• Sustainable exploitation of natural resources • Sustainable biomass production • Reduce or prevent negative impacts of fuel switching

Source: Tables ES4 and ES5 based on a review of literature on reforms covering over 21 countries, including GSI (2012) and Aramide et al. (2012); Beaton & Lontoh (2010); Breisinger, Engelke & Ecker (2011); Burniaux et al., (2009); Clements, Jung & Gupta (2003); Coady et al., (2010); Coady & Newhouse (2006); El Said & Leigh (2006); Ellis (2010); del Granado, Coady, & Gillingham (2012); assanzadeh (2012); IMF (2008); IMF (2012); Kojima (2009); Laan (2011); Mendoza (forthcoming); OECD (2011); de Oliveira (2010); Solanko (2011); Soni, Chatterjee & Bandyopadhyay (2012); Suwala (2010); Yusuf et al. (2010).

INTRODUCTION

By and large, the problems with fossil-fuel subsidies are widely recognized. Most governments in high-subsidizing countries want to reform them, recognizing the serious opportunity costs they represent. In practice, however, reform is difficult, often requiring a major economic restructuring that involves significant technical and political challenges.

The technical challenges revolve around how to deregulate prices in ways that minimize the negative impacts that can inadvertently result from reform. The political challenges revolve around how to pass through changes that may be deeply unpopular with large segments of the population, but are in the country's long-term interest.

At its heart, however, fossil-fuel subsidy reform is not just a problem—it is also an opportunity. In many countries, it would allow for a significant reallocation of resources in ways that are more economically, socially and environmentally sustainable.

The aim of this publication is to provide guidance on how governments in Southeast Asia can overcome technical and political challenges while harnessing this potential.

- **Chapter 1** provides international definitions and categories of subsidies, and sets out the context of subsidies for fossil fuels in Southeast Asia.
- **Chapter 2** looks at how governments can establish new pricing mechanisms.
- **Chapter 3** discusses projecting the impacts of reform and establishing mitigation measures.
- **Chapter 4** explores how reform can be made more politically feasible through internal organization, consultation and communications.
- **Chapter 5** sets out what the broad implications of this guidance might be for Southeast Asia.

The policy advice represents the accumulation of knowledge built up by the International Institute for Sustainable Development's (IISD) Global Subsidies Initiative (GSI) in its ongoing research program on fossil-fuel subsidies. It also draws on discussions with Southeast Asian policy-makers at an IISD-GSI forum on this issue in November 2012: http://www.iisd.org/gsi/news/iisd-gsi-forum-south-east-asia.

The GSI was established in 2005 and is an entirely independent, research-driven initiative, focused on how subsidies can undermine or support sustainable development. Through technical analysis, policy dialogues and communication with stakeholders, the GSI's aim is to bring about transformative change in the implementation of subsidy reform.

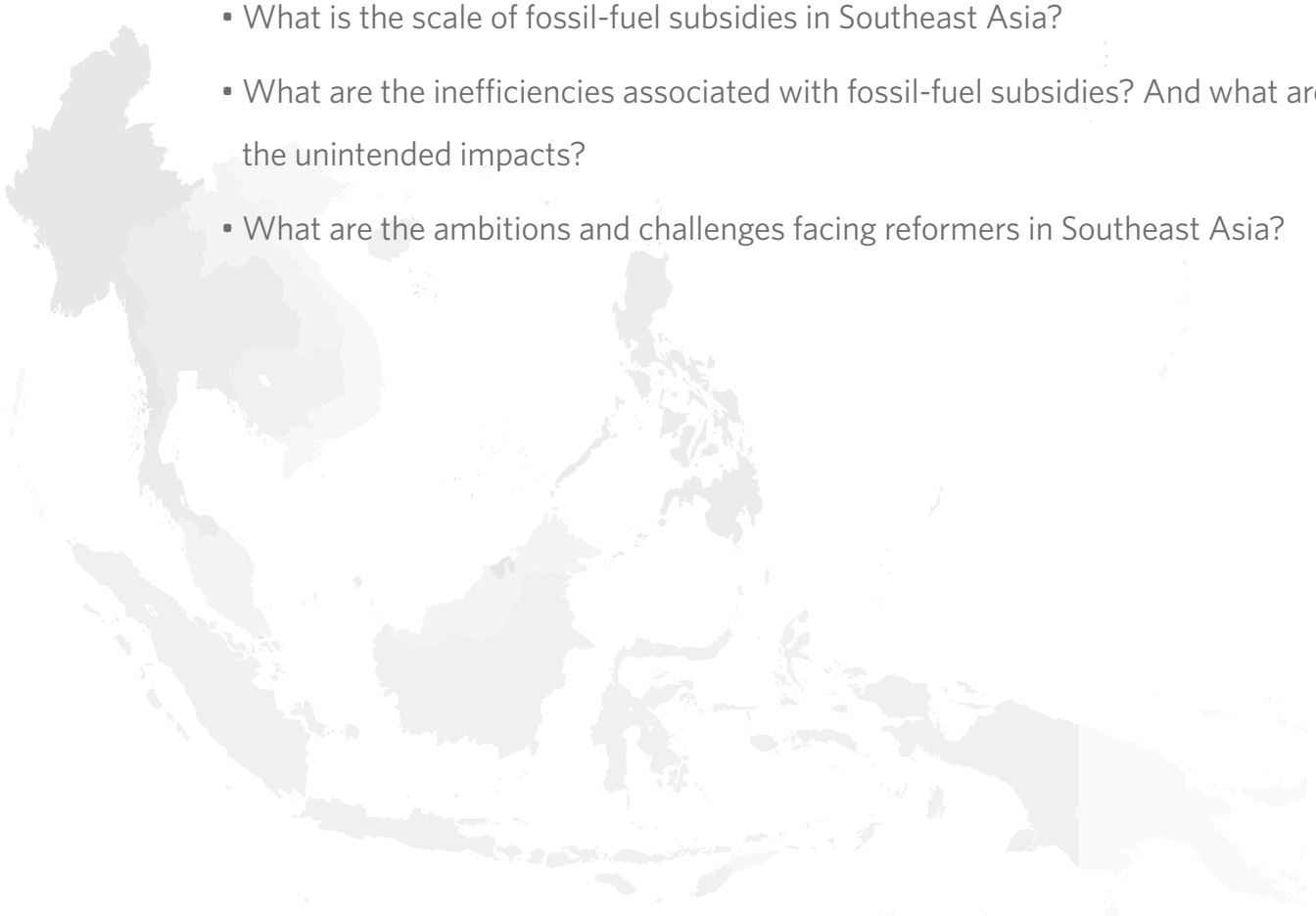
CHAPTER 1

FOSSIL-FUEL SUBSIDIES FOR ENERGY CONSUMERS IN SOUTHEAST ASIA

This chapter provides an introduction to thinking about the reform of fossil-fuel subsidies in Southeast Asia.

It answers the following questions:

- What is an energy subsidy?
- What is the scale of fossil-fuel subsidies in Southeast Asia?
- What are the inefficiencies associated with fossil-fuel subsidies? And what are the unintended impacts?
- What are the ambitions and challenges facing reformers in Southeast Asia?



The exact form of fossil-fuel subsidies for energy consumers is rarely identical between two countries. The five biggest subsidizers in Southeast Asia in terms of absolute spending—Indonesia, Malaysia, the Philippines, Thailand and Vietnam—all have different designs and circumstances underlying their support mechanisms.

However, while subsidies differ, their consequences are often the same. Most governments subsidize fossil fuels with good intentions: to improve energy access, especially for the poor; to provide assistance to businesses; to protect markets from price volatility; and to curb inflation. But in most cases the subsidies are blunt—and therefore very expensive—tools that inefficiently reach their intended beneficiaries. Further, they often lead to unintended consequences, such as underinvestment in the energy sector, fuel smuggling, wasteful energy consumption, increased air pollution and emissions of greenhouse gases (GHGs). And because households and businesses assume cheap fossil energy will continue into the future, they make investment decisions that lock in competitive inefficiencies and create strong political resistance to market-based pricing.

This chapter summarizes how fossil-fuel subsidies can be defined and the key motivations for their reform in Southeast Asia. It does not attempt to cover these complex issues in detail. Rather, it is simply intended to provide useful context for the focus of this guide: how governments can better prepare for reform.

1.1 What is an Energy Subsidy?

The GSI uses a definition of "subsidy" that is based on the World Trade Organization's Agreement on Subsidies and Countervailing Measures, which is supported by 158 countries. Under Article 1: Definition of a Subsidy, the Agreement on Subsidies and Countervailing Measures (ASCM) determines that subsidies exist where governments:

1. Provide a direct transfer of funds or potential direct transfer of funds or liabilities
2. Forgo or otherwise fail to collect revenue
3. Provide goods or services below market rates or purchase goods above market r ates
4. Provide income or price support

The GSI adopts a broad definition in order to identify all existing subsidies in a sector, regardless of whether they are considered "good" or "bad." This includes most support that could be considered a "subsidy," except for environmental externalities (such as carbon emissions or pollution). This provides a comprehensive start in a three-step approach to: *identify, measure and evaluate* subsidies (GSI, 2010). The final step assesses if subsidies operate as intended, so it should not be assumed that all subsidies are necessarily in need of reform.

Based on the ACSM list above, the GSI has developed subcategories of subsidies (see Table 1) that constitute a comprehensive checklist for identifying and analyzing subsidies in any country. This has been used in the GSI's series of country case studies *Fossil Fuels – At What Cost?* to identify and quantify subsidies to upstream oil and gas activities.[1]

[1] For studies on Canada, Indonesia, Norway and Russia see: http://www.iisd.org/gsi/fossil-fuel-subsidies/fossil-fuels-what-cost

TABLE 1 | CHECKLIST OF ENERGY SUBSIDIES

Direct and indirect transfer of funds and liabilities	**Direct spending**	Earmarks
		Agency appropriations and contracts
		Research and development support
	Government ownership of energy-related enterprises	Security-related enterprises
		Municipal utilities and public power
	Credit support	Government loans and loan guarantees
		Subsidized credit to domestic infrastructure and power plants
		Subsidized credit to oil and gas related exports
	Insurance and indemnification	Government insurance/indemnification, insurance caps
		Statutory caps on commercial liability
	Occupational health and accidents	Assumption of occupational health and accident liabilities
	Environmental costs	Responsibility for closure and post-closure risks
		Waste management
		Environmental damages
Government revenue foregone	**Tax breaks and special taxes**	Tax expenditures
		Overall tax burden by industry
		Excise taxes/special taxes
Provision of goods or services below market value	**Government-owned energy minerals**	Process for mineral leasing
		Royalty relief or reductions in other taxes due on extraction
		Process of paying royalties due
	Government-owned natural resources or land	Access to government-owned natural resources land
	Government-owned infrastructure	Use of government-provided infrastructure
	Government procurement	Government purchase of goods or services at above-market rates
	Government-provided goods or services	Government-provided goods or services at below-market rates
Income or price support	**Market price support and regulation**	Consumption mandates
		Border protection or restrictions
		Regulatory loopholes
		Regulated prices set at below-market rates
		Regulated prices set at above-market rates

In the context of fossil-fuels, subsidies are often split into two non-exclusive categories: those that reduce the cost of consuming fossil-based energy, called consumer subsidies, and those that support the domestic production of fossil fuels, called producer subsidies. This guide focuses on the reform of consumer subsidies only. Though subsidies come in many different forms, the types of fossil-fuel consumer subsidies that are most commonly observed include:

- Direct government expenditure to maintain fossil-fuel prices at below-market levels
- Selling domestically produced energy at below-market prices
- Regulation requiring other market actors to absorb the cost of selling fossil fuels at below-market prices
- Setting prices that do not recover the full costs of energy production or the costs of maintenance and reinvestment in energy infrastructure
- Foregoing revenue through tax exemptions, rebates or credits for fossil-fuel consumers

Several methodologies—not mutually exclusive—can be used to identify and measure consumer subsidies.

METHODOLOGIES FOR IDENTIFYING AND MEASURING CONSUMER SUBSIDIES

BOX 1

A price-gap approach measures the net price effect of all energy subsidies and taxes in place. It does this by quantifying deviations between the price of international benchmarks and the price of fossil fuels within a country, adjusted for the costs of bringing the commodity to the market. If a global market for the fossil fuel does not exist, the approach can be adapted to quantify the gap between actual energy prices and the estimated cost of energy production and supply to the market. It is principally used to estimate consumer subsidies, though estimates may include producer subsidies that also lower consumer prices (Koplow, 2009).

A bottom-up approach quantifies support to energy consumption through examination of individual government programs.

A hidden cost approach estimates the value of energy that is consumed but not sold. It does this by estimating the difference between a utility's current revenue and the revenue it would receive if it operated efficiently—charging tariffs that cover full costs, collecting all bills and with normal losses (Organisation for Economic Co-operation and Development [OECD], 2010b).

The consumer support estimate is a framework for organizing information on consumer support. It covers both measures that lower prices and those that support consumers through other means, thus requiring the use of both price-gap and bottom-up estimation methods or their equivalents (OECD, 2010b).

This guide predominantly makes reference to country-specific subsidy estimates from the International Energy Agency's (2012) price-gap series. Although this method of quantification is not perfect,[2] it is widely recognized and allows comparisons of subsidies across countries and over time (Koplow, 2009). At a national level, more detailed estimates, derived from a single country study, would be needed to provide much more exact data and better inform national policy-making.

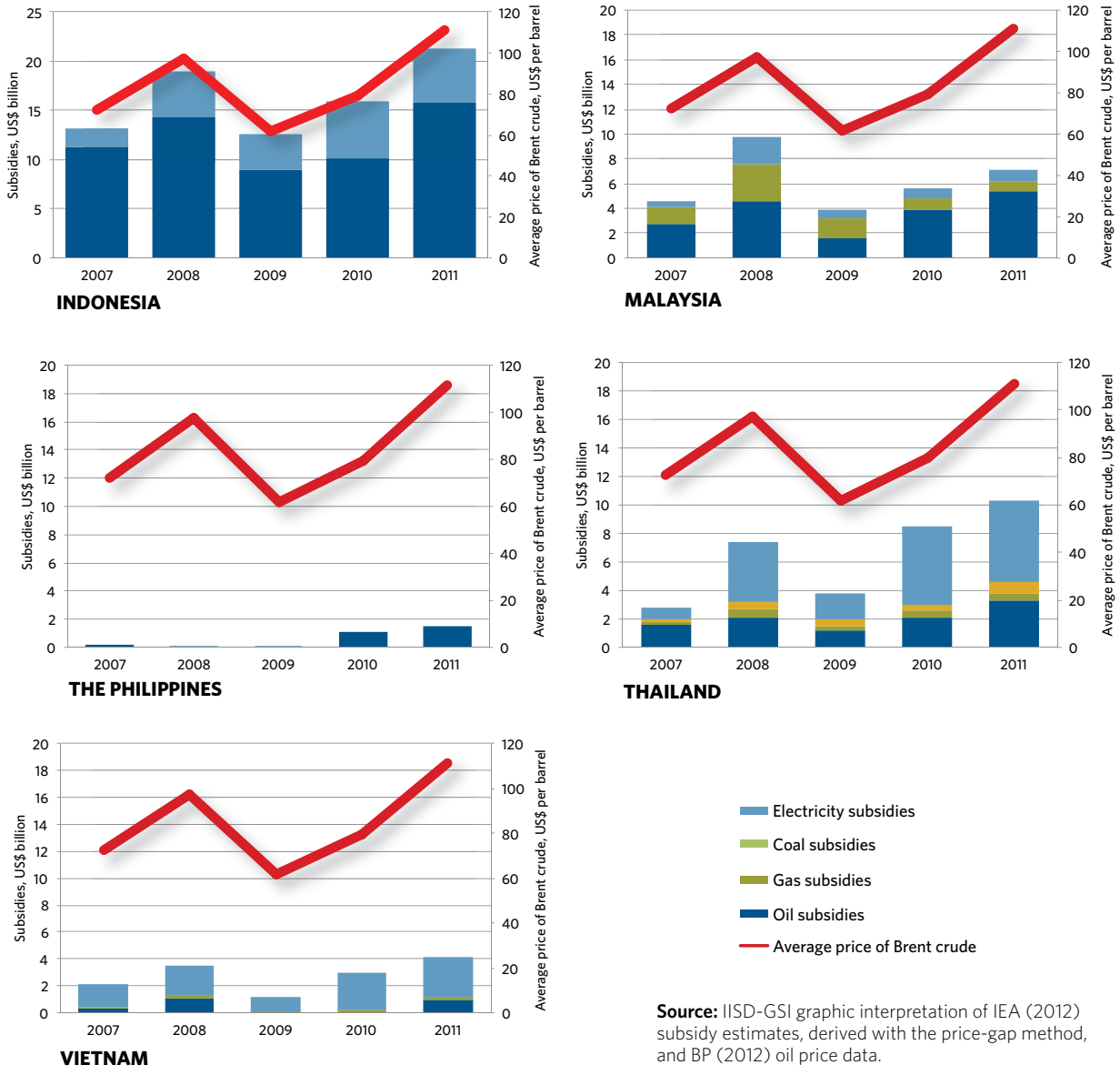
[2] For a broader discussion of the price-gap approach and other methods to quantify energy subsidies, please refer to Koplow (2009), OECD (2010b) and UNDP (2011).

1.2 The Scale of Fossil-Fuel Subsidies for Consumers in Southeast Asia

Governments in Southeast Asia subsidize different fuels to varying extents. As shown in Figure 1, according to the International Energy Agency (IEA), Indonesia subsidizes mostly petroleum products and electricity. Malaysia subsidizes all fuel types except for coal. The Philippines have largely removed all energy subsidies, but have preferential taxation provisions for some petroleum products, such as diesel. Thailand subsidizes all energy types, while the bulk of energy subsidies in Vietnam are in the electricity sector.

Figure 1 also shows that Southeast Asia's subsidy costs fluctuate significantly year by year, regardless of the absolute volume of subsidization or the fuels being subsidized. This is because many subsidy mechanisms do not let domestic consumer prices fluctuate fully in response to international changes; consequentially, when the world price rises, the cost of the subsidy rises too. Figure 1 illustrates this by plotting the average international oil price. The cost of subsidies for oil, gas and coal tends to follow this indicator because world oil prices are used as an index for many gas prices in Asia, and gas prices are, in turn, linked to coal, though with coal prices being the least responsive of the three. Since fossil fuels are the main input for electricity generation in most countries, price changes affect electricity subsidies too.

FIGURE 1 | STRUCTURE OF ENERGY SUBSIDIES IN INDONESIA, MALAYSIA, THE PHILIPPINES, THAILAND AND VIETNAM, 2007–2011



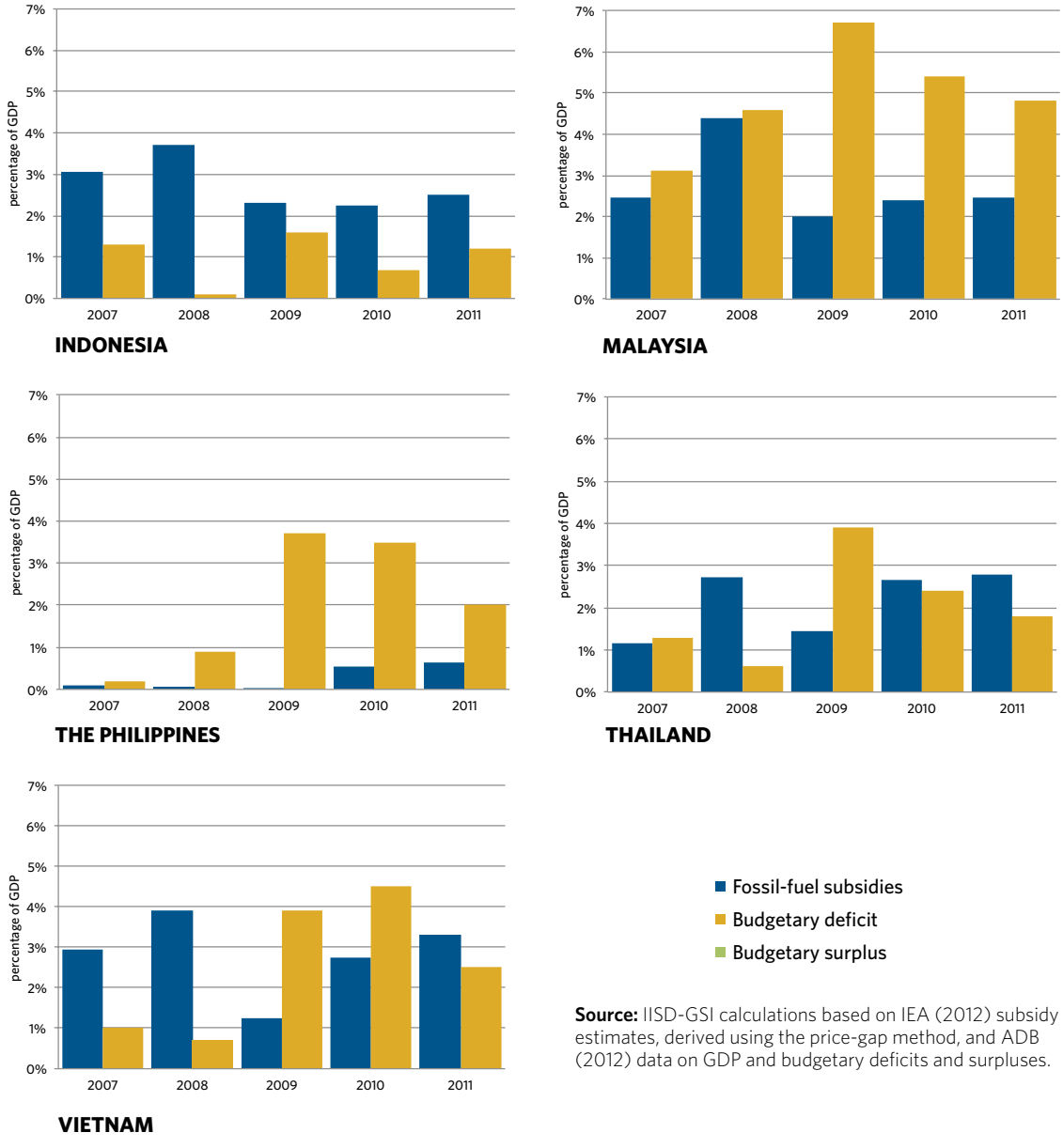
Source: IISD-GSI graphic interpretation of IEA (2012) subsidy estimates, derived with the price-gap method, and BP (2012) oil price data.

1.3 Fiscal Burden and Opportunity Cost

As illustrated in Figure 2, the estimated value of fossil-fuel subsidies has been above two per cent of GDP for most of Southeast Asia's biggest subsidizing countries over the past five years. This can represent a significant fiscal burden for net energy-importing countries that set a fixed price of fuel. In other cases—such as in net exporting countries, where domestic reserves are sold in reference to production cost, or when power sector subsidies are paid for through lack of investment in infrastructure—no fiscal cost is recorded. These off-budget subsidies still represent an opportunity cost, however, that is as real as their on-budget counterparts.

The opportunity cost of fossil-fuel subsidies is the money that is not spent on other priorities such as public transport and infrastructure, or improving health care and education systems. As an illustration, Figure 2 shows fossil-fuel subsidies compared to the value of budgetary deficits and surpluses. The subsidies were larger than the budgetary deficits of Indonesia in 2007–2011; Thailand in 2008, 2010 and 2011; and Vietnam in 2007 and 2011. In all other cases, the subsidies were equal to a considerable share of budgetary deficits.

FIGURE 2 | ENERGY SUBSIDIES AND BUDGETARY DEFICIT OR SURPLUS AS A PERCENTAGE OF GDP IN INDONESIA, MALAYSIA, THE PHILIPPINES, THAILAND AND VIETNAM IN 2007–2010.



Source: IISD-GSI calculations based on IEA (2012) subsidy estimates, derived using the price-gap method, and ADB (2012) data on GDP and budgetary deficits and surpluses.

1.4 Inefficiencies and Unintended Impacts

The policy objective behind most fossil-fuel subsidies is to provide support to the poor and vulnerable. But fossil-fuel subsidies are usually a highly inefficient welfare policy. In most cases, they benefit the rich and middle classes much more than the poor.

INEFFICIENT WELFARE: THE RICH GETTING MORE THAN THE POOR

BOX 2

Numerous studies show fossil-fuel subsidies providing the largest benefit to high-income groups. This is because subsidies are usually provided per unit of energy (e.g., per litre or cubic metre or tonne) and eligible to most, if not all, consumers. As in other world regions, Southeast Asia's biggest energy consumers—and therefore the biggest recipients of subsidies—are the wealthiest households and those in urban areas.

The IEA (2011) estimates that of the US$409 billion spent on fossil-fuel consumption subsidies in 2010, only US$35 billion, or 8 per cent of the total, reached the poorest 20 per cent of the population. In a review of 20 country studies on petroleum product subsidies, Arze del Granado, Coady and Gillingham (2012) find that, on average, the richest 20 per cent of the population capture 42.8 per cent of all benefits. On average, the bottom 20 per cent receive only 7.2 per cent of benefits and the next poorest quintile only 11.4 per cent.

Generally, gasoline subsidies are the least efficient of all fossil-fuel subsidies. In Indonesia, the World Bank (2011a), using data from the 2009 national household socioeconomic survey, estimated that the richest half of households consumed 84 per cent of subsidized gasoline. In contrast, the poorest 10 per cent accounted for less than 1 per cent of subsidized gasoline use. Further examination of survey data suggested that about two thirds of poor and near-poor households (defined as the bottom 50 per cent) do not consume gasoline at all. Such subsidies do provide some support to the poor indirectly—for example, by lowering the price of goods that use gasoline as an input—but this still represents a fraction of total benefits. Arze del Granado et al. (2012) find that the average direct and indirect benefits of petroleum product subsidies received by the poorest 20 per cent are very similar: 7.1 per cent and 7.2 per cent of total direct and indirect benefits, respectively.

Fossil-fuel subsidies also tend to have a range of unintended impacts.[3] Depending on their design, this may include:

- Volatile fossil-fuel prices can push up on-budget subsidy costs higher than anticipated, causing fiscal crisis, higher trade deficits, loss of foreign exchange reserves and currency instability.
- Low prices can make the energy sector unattractive for investors by lowering the return on investment for projects and making it harder for renewables to compete. This can lead to underinvestment in energy, renewable technologies and energy infrastructure and services.
- Low prices stimulate demand. For fuel exporters, this encourages faster depletion of reserves. For importers, this can lead to a growing reliance on imports and may reduce energy security.
- Low prices reduce incentives for energy conservation and efficiency for investors and consumers.
- Price disparities between fuels can lead to non-authorized fuel substitution, such as cooking liquefied petroleum gas (LPG) cylinders on cars—which are not only illegal, but also dangerous—or adulterating diesel with kerosene.
- Price disparities across borders can lead to fuel smuggling and the emergence of black markets.
- All the above impacts lead to increased air pollution and greenhouse gas emissions (see overleaf).

[3] Interested readers can refer to publications such as IEA, OECD, OPEC & World Bank (2010) and World Bank (2010) for more information on the unintended impacts of fossil-fuel subsidies.

WHAT ABOUT THE ENVIRONMENT?

BOX 3

Fossil-fuel subsidies cause people to consume more fossil fuels, leading to greater GHG emissions and local air pollution. According to the IEA (2010), phasing out consumption subsidies for fossil fuels between 2011 and 2020 would cut global carbon dioxide emissions by 5.8 per cent, compared with a "business-as-usual" scenario. This is equal to 40 per cent of the reductions needed to achieve the "450 Scenario"—the concentration of GHGs that would provide a 50 per cent chance of stabilizing the global average temperature increase at 2°C. Using a general-equilibrium model, the OECD has estimated that emission reductions could be as high as 10 per cent by 2050 if subsidies for fossil-fuel consumption are removed by 2020 (IEA, OECD, OPEC & World Bank, 2010).

1.5 Ambitions for Reform

Fossil-fuel subsidy reform has become an important item on the agenda of several international processes that include Southeast Asian economies as members. Mostly notably, in 2009 the members of the G-20 (including Indonesia) committed to fossil-fuel subsidy reform (G-20, 2009), soon followed by the Asia-Pacific Economic Cooperation (APEC), including the five biggest subsidizing countries in Southeast Asia, who committed to "rationalize and phase-out over the medium term fossil-fuel subsidies that encourage wasteful consumption" (APEC, 2009). Efforts are also ongoing to have fossil-fuel subsidy reform recognized and promoted as a GHG mitigation measure within the United Nations Framework Convention on Climate Change (Bast, Kretzmann, Krishnaswamy & Romine, 2012).

At a national level, a number of Southeast Asian governments have independently announced commitments to reform fossil-fuel subsidies. Indonesia has published a number of plans with respect to petroleum products and electricity pricing (Tumiwa, Lontoh, Laan, Lang & Vis-Dunbar, 2012) The Malaysian government has set out subsidy reform as a goal in its *Tenth Malaysia Plan 2011–2015* (EPU, 2010). In the past few years, Thailand has taken a number of steps to reduce LPG and natural gas subsidies (Platts, 2012a) and Vietnam has initiated a process to move towards market-based pricing for its electricity sector (Government of Vietnam, 2009). The Philippines, having very little subsidization, has commissioned a number of independent reviews since 2005 to defend its Oil Deregulation Law (IOPRC, 2012)

1.6 Challenges to Reform

Since the exact nature of fossil-fuel consumer subsidies is never the same from one country to another, the challenges associated with reform can differ significantly. Countries can have very different starting positions and background economic circumstances. At the same time, lessons can be learned from all countries—be they successful or unsuccessful, regional or international. Such experiences can be highly valuable for policy-makers thinking about how to design and implement fossil-fuel subsidy reforms.

Generally, challenges can be split into the technical and the political. Technical challenges are focused on the detail of transitioning away from subsidies. How can a market-based pricing mechanism be established? Will households and businesses struggle to adapt and, if so, can subsidy savings be redirected to support them? Political challenges are focused on making a plan politically possible. Have people's concerns been taken into account? Do they understand how negative impacts will be mitigated? Do they trust the government to take subsidy spending and redirect it into better policies? It is these challenges that this guide sets out to explore.

CHAPTER 2
GETTING THE PRICES RIGHT

This chapter discusses the routes that governments can take to ensure that fossil energy prices are set by the market, not by subsidies. It is focused particularly on lessons learned from different petroleum product pricing mechanisms and how countries have tried to change pricing mechanisms as a way to eliminate subsidies.

It answers the following questions:

- What would be the right energy price for my country?
- Can my country reduce energy prices without subsidies?
- What is my country's starting position towards decontrolling energy prices?
- How fast can my country move with pricing reforms?
- What are my country's options to decontrol energy prices in the short term?
- What are my country's options to decontrol energy prices in the longer term?
- What can my country do to address oil price volatility?
- Once I have changed my pricing mechanism, are subsidies gone forever?

It concludes with a list of "do's" and "don'ts" for policy-makers in designing and applying energy pricing policies and highlights the importance of matching subsidy reform with competition, anti-cartel and taxation policies.

2.1 What Would be the Right Energy Price for my Country?

By and large, the right price for energy in any country is equal to the marginal cost of energy supply to the country's market.[4] Subsidies do not reduce the absolute cost of energy; they simply change the way that the cost is shared across a country's population. The real question is *who* are the actors that pay this cost and *what proportion* is paid by each one: energy consumers at the point of sale? General taxpayers, by paying subsidies to reduce prices? Future generations, through debt or a lack of investment in energy infrastructure?

A "pricing mechanism" is the system by which point-of-sale prices are set—the "invisible hand" of the market, government intervention or a mixture of the two—and the system by which costs not captured in point-of-sale prices are redistributed elsewhere. A pricing mechanism cannot change the fundamental factors that are driving up energy costs globally, such as growing demand in emerging markets and higher costs of fuel extraction.

Discussion around the "right" price for energy usually differs between net energy exporters and importers. A sense of entitlement to cheap energy often exists in countries with significant fossil energy resources (Segal, 2012). This may be part of the "social contract" between citizens and their governments (Ross, 2012; Randall, 2012), especially if there is little in the way of social safety nets or public services. However, this too can be framed in terms of shifted costs—selling fossil energy at low prices comes at the opportunity cost of selling the same energy at international prices (see Box 4). It can also cause countries to "live through" their energy reserves at a faster rate. Citigroup researchers, for example, project that Saudi Arabia, currently the world's leading oil producer, may become an oil importer by 2030 (Daya & El Baltaji, 2012). And market forces still manifest themselves in the form of fuel smuggling, fuel shortages and the emergence of black markets.

BENCHMARKING ENERGY PRICES: PRODUCTION COSTS VERSUS OPPORTUNITY COSTS

BOX 4

Classical economics argue that prices for tradable goods should be determined by the global market and be uniform across all countries engaged in free trade. This approach means that the price of a unit of energy has little to do with its production costs. Instead, it should be equal to the opportunity cost of selling this unit on the world market, adjusted for transport, insurance and other costs of bringing this fuel to the next international trade hub.

For commodities such as crude oil and refined petroleum products, which are traded and where it is possible to identify an international benchmark, it is often assumed that prices in international markets are good approximations of opportunity costs.

The methodology of determining benchmark prices is more complex for natural gas and other energy products, because their tradability may be constrained by logistics, the longer-term nature of contracts and other factors. Further, production costs do matter when discussing issues such as the production of joint energy products (such as crude oil and LPG or natural gas) and the availability of spare capacity in some oil-exporting countries such as Saudi Arabia, Kuwait and the United Arab Emirates.

Source: GSI and Fattouh & El-Katiri (2012, pp. 11–12)

[4] In a perfectly competitive market, price is equal to marginal cost. This guide's discussion of pricing is focused on crude oil and petroleum products—and oil markets are considered to be very competitive, although there are some caveats. For example, in some countries there is only one fuel product supplier. Markets for other fossil fuels can be less competitive, but a detailed discussion of non-oil products is beyond the scope of this chapter.

2.2 Can my Country Reduce Energy Prices Without Subsidies?

Policy can lower prices by addressing the components that make up the marginal cost of energy supply: energy production, transportation and distribution. Strategies to use electricity more efficiently can also have the effect of reducing the price of each unit of energy service required—even if the price per joule or litre remains unchanged.

The cost of these components can vary significantly across countries. All other things being equal, this will mean, for instance, that the marginal cost of centralized electricity transmission is always higher in archipelago countries than in mainland economies. But it also means that, in those same countries, alternative energy technologies, such as off-grid solar, wind or biogas power, may be more competitive.

Various strategies can help reduce the point-of-sale price of energy. **One of the most important is the encouragement of competition among suppliers and good enforcement of anti-collusion rules.**

Others include:

- Discovering new energy sources
- Installing efficient and competitive energy-producing capacity within national borders
- Developing new technology that lowers the cost of energy production and increases efficiency
- Improving the efficiency of distribution channels
- Reducing wasteful energy losses and promoting energy efficiency and conservation

Alone, secondary measures may not be sufficient to lower prices. It is normally a combination of some or all of these strategies with strong competition laws that maximizes the price-lowering effect. For example, though the United States levies much lower point-of-sale taxes than most developed countries and has some targeted fossil-fuel consumer subsidies conferred by tax exemptions (OECD, 2011), its prices are also low due to economies of scale combined with efficiency arising from fierce competition. This allows it to maximize the benefit it receives from having a significant amount of mostly old but efficient domestic refining capacity.

BOX 5

IS LOW TAXATION A FORM OF SUBSIDIZATION?

The individual level of taxation on each energy type is a question of national discretion. Many countries set low taxes on energy in order to help keep prices low. According to the GSI definition of a subsidy, low taxes are not necessarily a form of subsidy. Setting different tax rates on different fossil fuels is also not necessarily a subsidy, since fuels can have individual qualities and uses that influence the appropriate tax level. By corollary, this means that taxes would be expected to be at similar levels for fuels that have similar properties and characteristics, for example gasoline and diesel.

Tax-related subsidies do exist where there are tax exemptions, rebates or credits. These are subsidies because they represent deviations from the levels that governments have established as being appropriate taxation for each fossil fuel. Any temporary relaxing of these levels is a decision to forgo revenue that has been determined a fair level to collect on the product in question.

The question "What is the most appropriate level of fossil-fuel taxation?" is a complicated one that has its own policy literature. It requires a discussion of the most efficient rate for fossil fuel taxes, and whether taxes raise enough revenue to pay for public goods in the energy system (such as roads) and to internalize the public cost of environmental externalities (such as air pollution and GHG emissions). The German Agency for International Cooperation (GIZ) argues that a principle of good motor fuel pricing is to set tax rates that reflect the cost of financing the transport sector and account for environmental externalities (GIZ, 2012). Coady et al. (2010) conclude from a review of literature that optimal tax rates vary between countries—for example, because of different levels of traffic congestion—but that a tax of US$0.30 or US$0.40 per litre may be indicative of the optimal tax for gasoline and diesel.

2.3 What is my Country's Starting Position Towards Establishing Market-Based Prices for Fossil Fuels?

The path to fossil-fuel subsidy reform depends on which pricing policies are being used to subsidize individual fuels. The GSI adapts the pricing dimensions that have been put forward by the GIZ (2012), in the context of motor fuel prices, to identify four dimensions by which fossil-fuel pricing policies can vary:

1. **Subsidies** The degree to which subsidies reduce the end-price of fuel by shifting costs onto the government, state-owned energy companies, private energy companies or other actors.
2. **Pass-through** The degree to which domestic pricing fluctuations match international price changes—literally, the degree to which an international price change is "passed through" into prices domestically.
3. **Transparency** The degree to which the composition and regulation of energy prices is open and transparent.
4. **Enforcement** The degree to which fuel pricing in real life actually follows officially adopted energy pricing arrangements.

In order to identify a country's starting position towards decontrolling energy prices, it is helpful to assess how current pricing policies compare across each of these four criteria. The following discussion is focused particularly on petroleum products, but many of the principles are transferable to other fuels.

The first and perhaps most important dimension of energy pricing is the degree to which energy subsidies reduce the end-price of fossil fuels or fossil-fuel-derived energy by shifting costs onto other actors. In this respect, policies can be roughly classified into four main categories (see Figure 3).

FIGURE 3 | DIMENSION 1: FOUR CATEGORIES OF SUBSIDY IN ENERGY PRICING POLICY

BELOW-MARKET FUEL PRICES

The degree of cost shifting caused by subsidies is usually greatest when policies fix a price, a price cap or a margin of price support. In this case, price regulations can be either market-wide (blanket subsidies) or discriminatory (prices for different categories of consumers are set at different levels). Governments may pay the cost of this themselves or through their ownership of, or other types of pressure on, energy companies that must sell fossil-fuel-derived energy to domestic consumers at a loss.

TAX EXEMPTIONS, REBATES OR CREDITS

Some countries provide tax exemptions or reductions for fossil fuels. These exceptions from the tax level set out by national law can be considered a subsidy (see Box 5, p. 23) and can be considered subsidies, equal in size to the tax revenues that are foregone.

ENERGY-RELATED HANDOUTS

Some policies allow pass-through of international prices onto the domestic market, but also provide energy-related handouts to certain groups of energy consumers. This can be done either in the form of monetary transfers or credits bundled with fuel purchases, or in the form of in-kind rations (the latter option being common for electricity).

NO ENERGY SUBSIDIES

Finally, policies may have no energy subsidies and no corresponding cost-shifting. By virtue of having no subsidies, policies must by definition allow a 100 per cent pass-through of fluctuations in world energy prices. If high ad valorem taxes are charged, the pass-through can be even more than 100 per cent.

In all cases, identifying where in the supply chain a subsidy is conferred is important too. For example, the subsidy might be focused on retail prices, wholesale prices or a targeted group of the population.

The second dimension of energy pricing is the degree of pass-through of international price fluctuations on domestic markets. There are three broad categories of pricing mechanisms that govern pass-through.

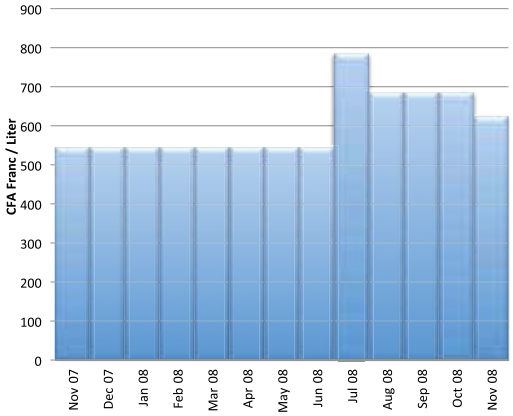
1. **Ad hoc pricing** is when prices are set manually by governments and changed on an arbitrary basis. In this system, there is no "pass-through" of international prices unless governments choose to change domestic prices. In this approach, energy prices are typically kept constant for long periods of time and significantly below the world level, as illustrated in Figure 4. Ad hoc changes to taxation can also be used to minimize the effective price increase domestically at times of high international prices.

2. **An automatic pricing mechanism** is a policy that places formal constraints on the pass-through of international prices, usually set out in a formula, without direct government decision-making. It is typically used to smoothen fuel price fluctuations: for example, only allowing domestic prices to change when there has been a certain percentage increase in prices internationally. Automatically flexible taxation systems can also be developed to help smoothen the impact of international price fluctuations.

   Stabilization funds are a variant of automatic pricing. They function by taxing fuel when international prices are low and putting the revenues aside in a special fund. The funds are then released in order to dampen domestic price increases when international prices rise, cushioning the impact of volatility. Depending on the pricing formula and how it is applied, full pass-through may be delayed or may not occur at all.

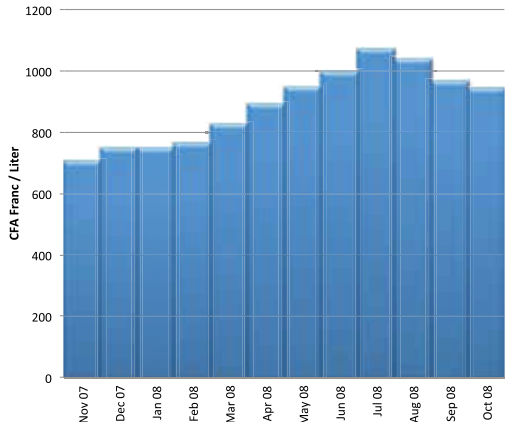
3. **Market-based or liberalized pricing** (also known as "passive" or "no regulation" of prices) allows energy prices to be set by the "invisible hand" of the market and gives governments no discretion to intervene. Market-based pricing provides full pass-through of international prices with minor delays. This is illustrated in Figure 6, which shows how a domestic fuel price would have changed from the end of 2007 to the end of 2008 if all fluctuations in international prices were passed through onto the domestic market.

FIGURE 4 | PRICES UNDER AN AD HOC APPROACH



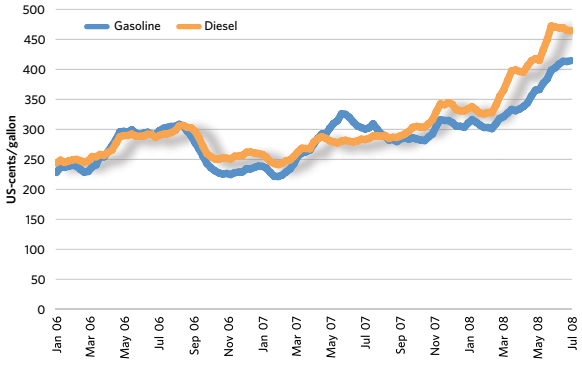
Source: Wagner (2010)

FIGURE 5 | PRICES UNDER AN AUTOMATIC PRICING MECHANISM



Source: Wagner (2010)

FIGURE 6 | PRICES UNDER MARKET-BASED PRICING



Source: Wagner (2010)

The third and fourth dimensions of energy pricing—transparency and enforcement—vary in ways that are fairly self-evident. Transparency depends upon the openness and accessibility of information about pricing policy and price composition. Enforcement is relevant because officially adopted prices do not always correspond with prices on the street because of issues like predatory pricing, black markets and smuggling. Even countries with no subsidies need to enforce anti-trust regulation and ensure fair competition to prevent collusion of suppliers and monopolistically high energy prices.

GIZ has developed principles of fuel pricing for motor fuels that synthesize the long-standing discussions that have taken place around good practice across different dimensions of pricing policy. They are summarized in Box 6.

BOX 6

GIZ'S PRINCIPLES OF FUEL PRICING

PRICE SETTING

- **Principle 1:** Prices, at the very minimum, cover production/transport/refining costs, including depreciation and external costs of production (e.g., environmental costs)
- **Principle 2:** There is a tax on fuels (e.g., a percentage of an excise) that helps finance the transport sector, in particular, road maintenance (as a rule of thumb, minimum of US$0.10 for road maintenance, including 20 per cent for rural roads)
- **Principle 3:** There is a tax on fuels (e.g., "eco-tax" or a percentage of an excise) that internalizes the external effects of transport sector by directly relating fuel consumption and carbon dioxide emissions, viewed as a proxy for other social costs (like accidents, congestion, etc.).
- **Principle 4:** There is a tax on fuels (e.g., value-added tax) that will contribute to general government budget and form a major contribution toward financing core state functions such as the health services, education and security. As fuel taxes are relatively easy to collect, they are a major source of revenue in many countries.

PRICE REGULATION

- **Principle 1:** Fuel prices are adjusted to reflect changes in cost of production, transport and refining, including depreciation and external costs of production (e.g., environmental costs).
- **Principle 2:** Fuel prices are adjusted to keep the pace with inflation (and increase in income).
- **Principle 3:** Fuel prices are adjusted in order to reduce pressure on government budgets and indicate clear exit strategies in cases of subsidies.

PRICE TRANSPARENCY

- **Principle 1:** Institutional stakeholders in price setting are known.
- **Principle 2:** Principles of price setting are known, that is to say, information is provided as to the determinants of fuel prices, frequency of updates and the underlying formula if an automatic mechanism is applied.
- **Principle 3:** Information on price composition is available.
- **Principle 4:** Information on prices and price setting are made public in an easy-to-access, comprehensible and accountable manner. Information is displayed on the Web, including: current price data for all fuel products; timelines of price adjustments; price components (production and/or import prices, taxation levels, and other charges); description of structure and modus operandi of pricing mechanisms (if applied); underlying legislation.

2.4 How Fast Can my Country Move with Pricing Reforms?

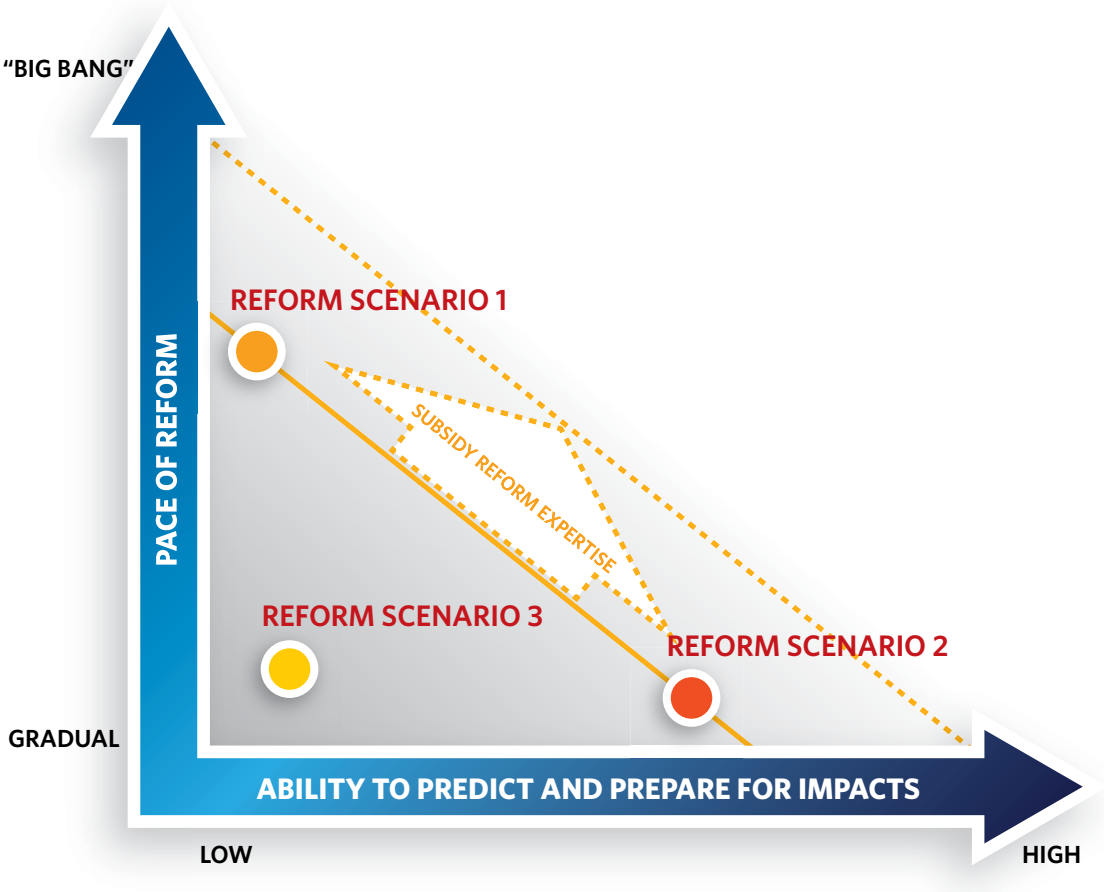
The pace at which fossil-fuel subsidy reform can be implemented will be country-specific, depending on the overall political and economic situation, the urgency of pressures caused by the cost of the subsidy and the perceived credibility of policy alternatives.

Generally, pacing is discussed in reference to one of two extremes: either following a "gradual" pace or following a sudden "big bang" or "shock therapy" approach. The exact meaning of these terms depends on how they are defined. There are several ways that the pace of the reform process can differ: the absolute scale of the price increases, the frequency of price increases, the number of price increases until reaching market-based pricing, the breadth of the consumers who will no longer be eligible for subsidies and the number of subsidies for different fuel products that are being reformed at the same time.

A "big bang" approach can be understood to mean reform that literally produces a "bang"—a significant shock to an economy and its citizens, including impacts such as high inflation and loss of economic activity. At its most extreme, a "big bang" approach would be an overnight elimination of all subsidies in a country where subsidies were very high, but in reality this takes place rarely. More often, a "big bang" approach is made up of a limited number of very large price increases.

Overall, it can be argued that a gradual approach is preferable because there is abundant evidence that economic agents often fail to follow rational economic behaviour, which serve as the basic assumptions of many economic models and plans. This means that people and the economy do not always react in the way that reformers anticipate and, therefore, there are limits to a good preparation. A gradual approach, by contrast, allows reform strategies to adapt based on the outcome of each successive subsidy reduction, decreasing the likelihood of perverse outcomes. Figure 7 below illustrates this idea using a hypothetical trade-off curve, the shape of which will be determined by the policy-makers' ability to predict an economy's reaction to the reform.

FIGURE 7 | THE TRADE-OFFS BETWEEN SUBSIDY REFORM PACE AND POLICY-MAKERS' ABILITY TO PREDICT AND PREPARE FOR ITS IMPACTS.



Attempts to move to market-based pricing at a rapid pace (Reform Scenario 1 in Figure 7) have been fully or partially successful in some cases, although rarely as one "big bang"—rather, as several rounds of significant price hikes, as instituted by some Eastern European countries following the collapse of the Soviet regime. Many responses to the 1997 Asian Financial Crisis also fall into this category, as illustrated by the case study on the downstream industry deregulation in the Philippines (see Box 7, opposite). Subsidy reform in Iran in 2010 is another example of rapid and significant price increases (Guillaume, Zytek & Farzin, 2011), though it is still not certain if these will prove to be successful (Hassanzadeh, 2012).

However, in the above-mentioned cases, a fast move to market-based pricing was politically feasible because it was part of much bigger political and economic transformations. Further, there have been also a number of cases where "big bang" attempts at fuel subsidy reform have failed, most recently in Bolivia in 2010 (Wagner, 2011) and in Nigeria in 2012 (Ncube, Lufumpa, Kayizzi-Mugerwa & Murinde, 2012).

In contrast, a gradual approach (Reform Scenario 2 in Figure 7), though also not without its faults (see Table 2 for more details), allows for more adjustments to be made to the reform plan on the go. For instance, China, Vietnam, Thailand and many other economies have stretched the process of bringing their energy prices to the international level over many years (IISD-GSI, 2012).

The trade-off between magnitude of reform and ability to prepare can also change as more knowledge about subsidy reform is accumulated. It can be argued, too, that many countries undertaking subsidy reform do not take full advantage of preparation (Reform Scenario 3 in Figure 7).

Ultimately, how a country undertakes subsidy reform will depend upon its particular circumstances. "Big bang" reforms may be the only option, for example, in countries running a serious subsidy-related budget deficit, or where political opposition to reform makes a gradual pace unviable. And background economic conditions might make the impacts of a gradual approach more or less preferable. Table 2 gives an overview of the pros and cons of each approach. It should be noted that, in reality, subsidy reforms seldom adhere to just one extreme—they are simply more likely to tend toward one than the other.

TABLE 2 | COMPARISON OF "BIG BANG" AND GRADUAL TIMING APPROACHES TO ENERGY PRICE REFORM

Performance criteria	Gradual	"Big bang"
Macroeconomic		
Reduction of costs	Gradual	Instantaneous
Impact on inflation and GDP	Low with each price increase, but risk of creating long-term expectations of inflation—"anticipatory inflation."	High, but over a short period.
Microeconomic and social		
Negative impacts on households and businesses	Low to moderate. Easy to manage by adapting reform plan. Households and businesses have longer to adjust.	High. May lack capacity to promptly change reform strategy. No time for households and businesses to adjust.
Political		
Added risk of political instability	Low, but gives opposition time to organize against reforms.	High
Use of political capital	High. Each price increase requires political capital. Increases risk of deferrals.	Medium. Only one price increase, but at the cost of a large economic shock.
Administrative		
Added risk of poorly designed reform strategy	Low to moderate. Actual impacts can feed into subsequent plans.	High. It is difficult to predict the impact of large economic shocks.
Added risk of poor implementation	Low. Allows for ongoing adjustment of reform strategy.	High. Requires very good projections of impacts and preparations.
Energy markets		
Reduced energy demand	Gradual	Instantaneous
Risk of hoarding fuel to profit from price increase	Moderate with each price increase. Rises if schedule of increases is known in advance.	High but one-off. Rises if date of price increase is known in advance.

THE PHILIPPINES: FOSSIL-FUEL SUBSIDY REFORM AND DOWNSTREAM OIL INDUSTRY DEREGULATION

BOX 7

1984–1996: Ad hoc subsidies effected through the stabilization fund, non-transparent and not fully enforced pricing policies

→

1996–1997: Automatic pricing and transition subsidies assisted by the stabilization fund, more transparency; better, but not fully enforced

→

1998–present: Market-based pricing, preferential taxation of diesel, enforcement can be improved

The Philippines started regulating the price of petroleum products in reaction to the oil price shock of the 1970s. In 1984 the Oil Price Stabilization Fund (OPSF) was created as a buffer reserve. When world oil prices were low, the government required oil companies to contribute mandatory levies to the fund. When they were high, the fund dispensed subsidies to oil companies. The OPSF was also used for cross-subsidies—gasoline and jet fuel were made to subsidize diesel, kerosene, bunker fuel and LPG. An Energy Regulatory Board (ERB) was formed and was tasked with setting the prices of petroleum products, revising them once or twice a year Independent Review Committee [IRC], 2005.

The system ran into problems when conflicts in the Middle East, particularly the invasion of Kuwait by Iraq, caused large spikes in international crude oil prices that used up all the funds in the OPSF. Political clamouring to keep prices low despite the lack of funds resulted in large a deficit, which led to a direct government subsidy amounting to PHP15 billion (around US$0.6 billion) by 1996.

Along with its general thrust of opening up the Philippine economy to market forces, the administration of President Fidel Ramos launched partial deregulation of the downstream oil industry in 1996, introducing an ERB-approved automatic pricing mechanism as a temporary measure that was concurrent with the continued OPSF operations.

The full deregulation phase started in 1998 against the backdrop of the Asian financial crisis and declining world prices for energy. The Filipino Congress adopted the Downstream Oil Industry Deregulation Act, which set the foundations of the industry's operations until the present day. The act encouraged competition and investment in the downstream industry and removed cross-product subsidies and market distortions. It prohibited government interference with any market aspect of the oil industry, including pricing, import and export processes and facilities and the establishment of retailers and refineries. Both the OPSF and the automatic pricing mechanism were abolished in 1998. Before the prices were fully floated, transition pricing was in place for a few months for the three most socially sensitive products—LPG, kerosene and regular gasoline (IRC, 2005).

As a result, prices for petroleum products in the Philippines rose to international levels and fluctuated together with them, which became particularly remarkable as world prices significantly increased several years after the deregulation. Moreover, for gasoline and LPG, the international price fluctuations are magnified by applicable tax rates. In the meantime, the Philippines applied preferential tax rates to diesel and, to a lesser extent, to kerosene.

In the dimensions of transparency and, especially, enforcement of the market, there is still room for improvement. In particular, oil marketing companies estimate that in 2012 up to one third of the diesel products in the Filipino market were smuggled (Rappler.com, 2012) while consumer and transport associations filed numerous complaints regarding possible price collusion in the Philippines (Remo, 2012). And the risk of back-sliding is always there: a number of interest groups continue to pressure the government to re-institute the OPSF and price subsidies (Fabella, 2011).

Lessons learned:

1. Ad-hoc management of an oil price stabilization fund can lead to significant deficits of the fund during periods of high world-energy prices. Replenishing the fund through external borrowing or budgetary transfers can take a heavy toll on the national budget and the economy as a whole.
2. The broader context of modernization efforts and opening up the national economy in reaction to the financial crisis may provide a favourable opportunity for de-subsidizing energy prices.

2.5 What are my Country's Options to Decontrol Energy Prices in the Short Term?

The options for decontrolling energy prices in both the short and long terms depend on the country's starting position. Although there are many variants, the two most common starting positions are either from a policy that sets prices on an ad hoc basis or with an automatic mechanism.

In the case of an ad hoc pricing starting point, there are two possible options for fast changes:

1. A reduction of ad hoc subsidies, which will result in a one-off pass-through of a proportion of international price increases to the domestic market—that is, the replacement of one set of ad hoc subsidies with another set of ad hoc subsidies.
2. A switch to an automatic pricing policy that will pass-through a proportion of fluctuations in international prices automatically.

Both options have their pros and cons, as discussed in Table 3.

TABLE 3 | OPTIONS FOR FAST ENERGY PRICING REFORM FOR A COUNTRY WITH LARGE AD HOC SUBSIDIES

Performance criteria	Reduction of ad hoc subsidies that results in a one-off pass-through of international prices on the domestic market	A switch to an automatic pricing policy that will pass-through fluctuations in international prices according to an established formula
Will budgetary pressures be eliminated?	For the immediate moment, but if and when the world price rises again, subsidies and budgetary pressures will re-emerge relative to the fixed price.	The success of relieving budgetary pressures will vary depending on the design and enforcement of the automatic pricing approach.
Will people's perceptions change?	No. People will continue to associate price changes with government decisions, and not the forces of energy supply and demand.	Yes. The switch will introduce the idea that it's market supply and demand, and not the government, that determines energy prices.
Ease of administering change to pricing policy	Usually does not require additional administrative capacity.	Can require additional administrative capacity building and the creation of pricing and regulatory institutions. May require more enforcement capacity.
Risk of hoarding and energy deficit	Limited, especially if the subsidy reduction is undertaken quickly and without prior notice.	High, especially if the schedule of automatic price adjustments is known in advance.

For countries with very low prices, it may not be feasible to move in a single step to an automatic pricing mechanism that allows full pass-through. Rather, the transition is more likely to be made up of a number of smaller ad hoc price increases or the adoption of an automatic pricing mechanism that is initially designed to keep prices low and to pass-through only a proportion of international price changes.

Countries might also reform their pricing policies from a starting point where they already have an automatic pricing mechanism. One reason to adapt or abandon an automatic pricing approach could be that it fails to achieve its purpose due to inconsistent enforcement (for instance, if an oil price stabilization fund accumulated debts and required budgetary transfers, as described in the above case study on the Philippines). Another reason could be market disruptions caused by fuel hoarding and shortages due to lags in the automatic pass-through of international price increases. In both cases, the poorly functioning automatic pricing mechanism would still have played an important intermediate role of accustoming market participants to the idea that it is the "invisible hand" of market forces—and not the government—that is "responsible" for changing fossil-fuel energy prices.

The shortcomings of the ad hoc reduction of subsidies are illustrated by the case study in Box 8 on an attempted subsidy reform in Nigeria in January 2012. Although the Nigerian economy is very different from Southeast Asian economies, its experience is noteworthy because it illustrates an extreme case of non-transparency and poor governance.

ATTEMPTED REFORM OF AD HOC GASOLINE AND KEROSENE SUBSIDIES IN NIGERIA

BOX 8

1973:
Ad hoc subsidies, non-transparent and poorly enforced pricing policies

2012:
Ad hoc subsidies, non-transparent and poorly enforced pricing policies

From 1973 until present, the Nigerian government has capped prices for gasoline and kerosene on the domestic market on an ad hoc basis. These subsidies are available for all consumers and delivered as payments to fuel distributors, including importers. Low-income households receive very limited benefits from these fuel subsidies. First, subsidies flow disproportionately to those who consume more fuel—that is, the middle and upper-middle class strata of the society. Second, significant volumes of gasoline are smuggled abroad as a result of the large price differential, which means that benefits are leaking to citizens of other countries. Kerosene subsidies are almost entirely captured by middlemen in the distribution chain, such that in 2011 most consumer prices across the country were around 300 per cent of the regulated price (Aramide et al., 2012).

In recent years, due to rising world energy prices, increasing domestic consumption and endemic corruption and fraud within the country, the value of subsidy payments has increased dramatically. According to a government-appointed committee set up to investigate the subsidy regime, costs have risen from ₦346.7 billion in 2008 (approx. US$3 billion) to ₦2,585.1 billion in 2011 (approx. US$16 billion), which is more than 10 times the sum of the planned budgetary appropriations (Aramide et al., 2012).

On January 1, 2012, the Petroleum Products Pricing Regulatory Agency attempted to fully remove the subsidy for gasoline by raising its price from ₦65 to ₦141 per litre (from US$0.40 to US$0.85). The price hike provoked widespread protests across the country, resulting in an eight-day strike. As a result of the government's negotiations, primarily with trade unions, gasoline prices were decreased again to ₦97 per litre (US$0.60). In other words, the subsidy was ultimately only partially removed (Ewi, 2012; Ncube, Lufumpa, Kayizzi-Mugerwa & Murinde, 2012).

The continuation of subsidies in Nigeria as they are now is fiscally unsustainable. In the short-to-medium term, complete removal of fuel subsidies is therefore a budgetary priority, but it is extremely unpopular politically. In 2012 the country's subsidy reform efforts focused on corruption and fraud investigations, eliminating leakage from the system and reducing the number of middlemen in fuel distribution chains (Aramide et al., 2012). However, progress in these dimensions remains slow and will require significant time to move forward.

Lessons learned:

- Raising energy prices from one ad hoc level to another ad hoc level does not change constituencies' perception that it is the government—and not the market—that sets energy prices, doing little to offset large-scale protests.
- Improving transparency and enforcement of pricing policies is an indispensable element of energy subsidy reform, even in the short term.

As a variant, some governments also attempt to reduce ad hoc subsidies through capping volumes of subsidized fuels and establishing discriminatory pricing for different categories of consumers. This option, however, like the in-kind rationing of fuels, often leads to system leakage and the emergence of black markets.

These kinds of problems emphasize the importance of the pricing dimension of enforcement. Some enforcement issues can be addressed through institutional or technological solutions to prevent cheating: for example, using dyes to mark lower-priced fuels can help to prevent fuel adulteration and manipulations across the supply chain. Other enforcement issues may be part of broader efforts to improve governance and accountability, usually taking place over the long term.

The case study of dual pricing of diesel in Nepal, described in Box 9, illustrates the type of problems that are typically associated with price caps.

BOX 9

ATTEMPTED REFORM OF DIESEL SUBSIDIES THROUGH DUAL PRICING IN NEPAL

The Government of Nepal has been subsidizing diesel prices through under-recovery of costs incurred by the Nepal Oil Corporation when it imports fuel from India.

Starting with a pump segregation experiment in the Kathmandu Valley that lasted only two months in 2008, the government has made several attempts in recent years to remove the subsidy for industrial consumers. Throughout this period, it has continued price support for diesel fuel purchased by individual consumers and small and medium-sized enterprises, defined as businesses that consume less than 4,000 litres of diesel per week (Kojima, 2009).

In the most recent reform attempt, the pumps that receive diesel at the subsidized rate are not allowed to sell it to industrial customers. As of June 2012, the Nepal Oil Corporation set the price of diesel for non-industrial consumers at NPR88 per litre (US$1.00) and for industrial consumers at NPR95 (US$1.08) per litre (My Republica, 2012).

Like previous attempts at differential fuel pricing, this policy faces fierce criticism by the industry. Further, the government lacks capacity to enforce dual pricing. Local media report that a number of fuel stations that get diesel at consumer rates are openly selling fuel to industrial consumers, thus making extra profits illegally (Tiwari, 2012)

Lessons learned:

- Targeting subsidies to a particular group of consumers can help relieve the burden of subsidies on government budgets.
- However, discriminatory pricing can result in leakage and emergence of a black market. Enforcement is key to successful targeting of subsidies.

Switching to automatic pricing is a necessary interim step toward full decontrol of energy prices. However, it is worth reiterating that the success of energy price reform under such a switch can vary depending on the design and enforcement of the automatic pricing approach. The case study on pricing policies in the People's Republic of China provides a useful illustration.

SWITCHING TO FORMULA-BASED ENERGY PRICING IN CHINA

BOX 10

Before 2008:

Ad hoc subsidies, non-transparent and not consistently enforced pricing policies

The National Development and Reform Commission (NDRC) supervises the pricing of fuels in the People's Republic of China. Until January 2009 the NRDC's approach could be classified as ad hoc subsidization.

Taking advantage of the drop in international oil prices in 2008–2009, the Chinese government started reforming its energy subsidies (worth US$27 billion for oil products in 2008 according to IEA estimates [IEA, 2011a]). In late 2008, China increased the consumption tax for oil products and abolished several fees and charges for road use.

At the same time, the NRDC switched to formula-based pricing of gasoline and diesel. The formula bases gasoline and diesel prices on a monthly moving average of crude oil prices (the basket includes Brent, Dubai and Cinta crudes). Under this approach, domestic wholesale prices of gasoline and diesel would be adjusted if the price of a basket of crude oil products on the international market had varied by more than 4 per cent since the previous monthly review. When the average is below US$80 a barrel, prices move relatively freely and refiners are expected to earn "normal" margins. Between US$80 and US$130 a barrel, domestic prices are responsive but refiners no longer make a profit. Above US$130, fuel tax breaks are used to keep domestic prices low. In practice, fuel price adjustments have lagged behind the world price movement, and refiners have suffered large losses (Government of China, 2008; GSI-IISD and APEC, 2012; Kojima, 2012)

The government also reserves the right to not apply the formula if warranted to achieve other social, political or other objectives, especially with respect to restraining inflation. As a result, the People's Republic of China has not passed through all international price increases since 2009.

Consequently, China's state-owned refineries have incurred huge losses ensuing from the need to purchase oil at world prices and sell refined products at a loss on the domestic market. For example, in 2011 the international crude oil price rose by 13 per cent, but the Chinese government increased fuel prices only by around 7 per cent. In the same year, China's two largest refiners, China Petroleum and Chemical Corp (also known as Sinopec) and PetroChina, posted refining losses of CNY37.1 billion (US$6 billion) and CNY60 billion (US$9.5 billion), respectively (Aibing, 2012; Reuters, 2012).

Lessons learned:

- It is possible to switch from ad hoc pricing policies to a mechanism that would be a hybrid between the ad hoc approach and automatic pricing, as China has since 2008.
- Inconsistent application of the formula-based approach to pricing is fraught with a risk of back-sliding to ad hoc subsidies.

2.6 What are my Country's Options to Decontrol Energy Prices in the Longer Term?

Longer-term scenarios of energy price reform allow for progress in all four dimensions:

- Reducing the burden of subsidies on government budgets: gradual price increases either for all fuels or for select fuels, along with development of fuel taxation.
- Pricing mechanisms: improvements in the functioning of automatic pricing mechanisms and preparing a switch to a fully liberalized market.
- Transparency: improving information availability and accountability with respect to energy price composition and regulation.
- Enforcing energy price regulations: building institutions and capacity to implement the official regulations to prevent subsidized fuel abuse, theft and smuggling, the emergence of black markets and price collusion.

For countries with large ad hoc subsidies, gradual price increases are a much smoother way of bridging the gap between domestic and international prices. However, sticking to the original plan of incremental price increases requires a lot of political will. Therefore, implementation of incremental price increases either necessitates a commitment from both the current government and the opposition, or has to be fully implemented within the term of one government. For instance, Ethiopia undertook the transition from ad hoc prices on the domestic market to international price levels through a series of monthly increases within one year, in 2008 (Gerasimchuk & Zamudio, 2012).

Another example of a gradualist approach to fossil-fuel price reform is Vietnam's revision of the electricity tariff considered in Box 11. In Southeast Asia, electricity generation is mainly based on fossil fuels, which makes the electricity tariff reform an integral part of fossil-fuel reform in general. In the meantime, providing access to electricity is extremely important from a social development perspective, and the challenges faced in the electricity sector are common across the region. In some cases, providing the minimal amount of electricity for free or at a low price may be used as compensation to mitigate the negative impacts of liberalizing prices for other fuels (for more detailed discussion of mitigation measures, see Chapter 3, Managing Impacts).

BOX 11

VIETNAM'S GRADUAL APPROACH TO REFORMING THE ELECTRICITY TARIFF FOR RESIDENTIAL CONSUMERS

Vietnam provides an example of a very gradual approach to electricity price reform. Increasing electricity prices for different consumer groups is part of the fundamental process of electricity market reform, which itself is an integral element of the country's transformation under Doi Moi (Renovation) launched in 1986 (Energy Alliance, 2012). The single-party nature of the Vietnamese government (under the leadership of the Communist Party of Vietnam), and the five-year approach to central economy planning facilitates the continuity of the reform.

Historically, the Government of Vietnam heavily invested in electrification of rural and mountainous areas to provide access to electricity. As a result, the share of households with electricity access grew from 2.5 per cent in 1975 to over 97 per cent by 2010. Thus, the country provided access to more than 80 million people over 35 years (World Bank, 2011b). Rural electrification has significantly improved the rural population's standard of living, including by increasing agriculture production efficiency and enabling children to do homework at night.

The massive electrification of the country would not have been possible without subsidies to poorer households, who could not otherwise afford electricity. Cross-subsidization among different consumer groups has been an integral part of this solution.

BOX 11 CONTINUED

The current complex electricity tariff is based on the Law on Electricity (2005) and Prime Minister's Decision 21 (2009). The latter decision aims at moving toward full recovery of costs and market-based pricing mechanisms, and better targeting of subsidies.

The tariff provides cross-subsidies from industrial and commercial to residential consumers, and the residential rates also progress based on the volume of electricity consumed, which is a proxy for household incomes. Residential energy rates are determined in accordance with the incremental block tariff (IBT). Before 2009 the subsidized first block of monthly "lifeline" consumption was set below 100 kWh, but in 2009 it was reduced to 50 kWh in an effort to better target the subsidy (International Bank for Reconstruction and Development & International Development Association, 2012). Table 4 presents an overview of the IBT from 2008 to 2011.

TABLE 4 | EVOLUTION OF THE INCREMENTAL BLOCK TARIFF IN VIETNAM (2008–2011)

Block (kWh)		2008	2009		2010		2011	
		VND/kWh	VND/kWh	% of average	VND/kWh	% of average	VND/kWh	% of average
Lifeline Tariff for Registered and Low-consuming Residential Consumers								
1	50	550	600	63.3%	600	56.7%	993	80.0%
IBT for other Residential Consumers								
1	100	550	865	91.2%	1,004	94.9%	1,242	100.0%
101	150	1,110	1,135	119.7%	1,214	114.7%	1,304	105.0%
151	200	1,470	1,495	157.6%	1,594	150.7%	1,651	132.9%
201	300	1,600	1,620	170.8%	1,722	162.8%	1,788	144.0%
301	400	1,720	1,740	183.4%	1,844	174.3%	1,912	153.9%
401		1,780	1,790	188.7%	1,890	178.6%	1,962	158.0%

Source: International Bank for Reconstruction and Development & International Development Association (2012)

The IBT is set to be gradually adjusted towards higher prices for all consumer categories in order to both reflect high inflation rates and recover the costs. However, increasing electricity prices has proved difficult over the past years. Vietnam has struggled with very high inflation, hence upward adjustments of electricity prices became a macroeconomic destabilization issue. One factor that is retarding the reform process is the lack of transparency of current pricing mechanisms: it is not clear how the losses of EVN, Vietnam's main state-owned electricity company, are split between losses due to selling electricity below generation costs on the one hand, and losses due to inefficiencies and operations in its non-core businesses on the other. This opaqueness makes price increases less acceptable to the public (United Nations Development Programme [UNDP], 2012).

Lessons learned:

- Provided there is accurate metering and billing, targeting subsidies for electricity use is technically much easier than targeting subsidies for combustible fuels. Therefore, where electricity access rates are high, targeted electricity subsidies can prove to be an important tool in assisting the poor to cope with energy prices.
- Extending electricity price increases over many years can help smooth the negative impacts of the reform, but keeping the rate of electricity price increases above the inflation rate is a major challenge.

Under a longer-term perspective, it is also possible to sequence energy price reform by type of fossil fuel. Normally, fuels that can be more easily de-subsidized include fuels that are not consumed by the most socially vulnerable and politically sensitive groups (e.g., gasoline, the "fuel of the rich," in most countries) and fuels for which there is no domestic source of production. In contrast, it may take longer to reform subsidies for fuels that are consumed by the most socially vulnerable and politically sensitive groups (e.g., diesel consumed by farmers and fishermen, LPG for cooking and kerosene for lighting in countries with low electricity penetration and any fuel subsidy reducing the costs of electricity). It may also take longer to reform subsidies on fuels for which there is a domestic source of supply, because reliance on them can be an issue of energy security and resource nationalism.

In the meantime, it is important to bear in mind that de-subsidizing certain fuels while preserving price support for others will trigger market distortions and fuel abuses. Examples include, but are not limited to, adulteration of non-subsidized diesel with subsidized kerosene, diesel subsidies for farmers and fishermen benefitting owners of large sport utility vehicles, and the installation of subsidized LPG cooking cylinders on cars. A case study of Thailand provides useful insights into how a country can improve its automatic pricing mechanism in the context of sequencing subsidy reform by fuels.

BOX 12

THAILAND'S SEQUENCING OF FUEL PRICE REFORM

A distinctive feature of Thailand's energy pricing system is the Oil Fund, officially established in 1979 as one its main responses to the global oil crisis of 1970s. As an oil price stabilization mechanism, it cushions fluctuations of world oil prices by collecting an Oil Fund Tax on fuels at a higher rate during times of low or average international prices and a lower, zero or a negative rate during periods of oil price hikes. Thailand's Oil Fund has also promoted certain fuels by providing direct subsidies or applying a preferential Oil Fund Tax rate. Such subsidies were provided to unleaded gasoline (in 1991–1996, with the phase-out of leaded gasoline being successfully accomplished by 1996), LPG for cooking (intermittently until the present), natural gas for vehicles (from 2002 until May 2012) and biofuels (from 2008 until present). Table 5 provides a detailed breakdown of inflows and outflows by fuel.

TABLE 5 | VALUES OF OIL FUND TAX LEVIED ON PETROLEUM PRODUCTS IN THAILAND

	Gasoline		Gasohol				Kerosene	Diesel		Fuel Oil	LPG (THB/kg)		
	ULG 95	ULG 91	E10	E20	E85	Gasohol 91		High speed diesel (HSD) 0.035%S	Low speed		Cooking	Industry	Automobile
1998	0.16	0.16	n/a	n/a	n/a	n/a	0.10	n/a	0.13	0.06	0.40	n/a	n/a
1999	0.09	0.09	n/a	n/a	n/a	n/a	0.10	n/a	0.08	0.06	-2.94	n/a	n/a
2000	0.34	0.22	n/a	n/a	n/a	n/a	0.10	n/a	0.11	0.06	-7.31	n/a	n/a
2001	0.50	0.30	n/a	n/a	n/a	n/a	0.10	n/a	0.50	0.06	-5.55	n/a	n/a
2002	0.50	0.30	0.27	n/a	n/a	0.27	0.10	n/a	0.50	0.06	-2.45	n/a	n/a
2003	0.49	0.30	0.27	n/a	n/a	0.27	0.10	n/a	0.50	0.06	-3.05	n/a	n/a
2004	-0.34	-0.59	0.24	n/a	n/a	0.27	0.10	-2.24	-2.27	0.06	-2.55	n/a	n/a
2005	1.28	1.03	0.13	n/a	n/a	0.16	0.10	-0.92	-1.02	0.06	-2.54	n/a	n/a
2006	2.70	2.50	0.84	n/a	n/a	0.84	0.10	1.47	1.47	0.06	-1.93	n/a	n/a
2007	3.67	3.37	0.85	n/a	n/a	0.62	0.10	1.40	1.39	0.06	-1.02	n/a	n/a
2008	3.78	3.31	0.77	-0.21	n/a	0.28	0.10	0.40	0.31	0.06	0.30	n/a	n/a
2009	6.94	5.31	1.78	-0.80	-7.88	1.17	0.10	0.78	1.20	0.06	0.22	n/a	n/a
2010	7.50	6.65	2.74	-0.41	-10.93	1.43	0.10	0.66	1.20	0.06	0.61	n/a	n/a
2011	4.90	4.38	1.87	-1.80	-13.50	-0.40	0.10	-0.60	1.20	0.06	1.14	n/a	n/a
2012 (Jan-July)	3.64	3.63	2.13	-0.95	-12.68	0.52	0.10	0.69	1.20	0.06	0.89	9.50	2.89

Units: THB/liter (with the exception of LPG)
Source: as reported by the Energy Policy and Planning Office (EPPO) of the Ministry of Energy of Thailand (EPPO, n.d.).

BOX 12 CONTINUED

The Oil Fund functioned relatively smoothly in the 1980s and 1990s, but started experiencing problems when world prices rose to record highs in 2004–2005. The Oil Fund Tax on principal fuels was reduced, which resulted in a considerable Oil Fund deficit. To cover this deficit, the Thai government transferred US$2.2 billion to the Oil Fund from the budget. The deficit also resulted in the decision to reduce fuel subsidies in the future (Changplayngam, 2008; Glassman, 2010).

As oil prices rose further in 2008, the Oil Fund—unlike oil price stabilization funds in many other countries—avoided running a deficit, making it a widely referred-to example of best practice. The key to success was that, instead of using the Oil Fund for subsidies again in 2008, the Thai government used a package of mitigation measures to manage the impacts on poor households. This offered, among other items: a minimum wage increase, free electricity and water (up to a consumption ceiling), and free rides for the poor on non-air-conditioned buses and trains (Kojima, 2009).

In 2009 the power to set Oil Fund Tax rates was shifted from the Energy Policy and Planning Office of the Ministry of Energy to the National Energy Policy Council interagency chaired by the Prime Minister (GSI-IISD and APEC, 2012). In the subsequent period, Oil Fund Tax rates were reduced or suspended for LPG and diesel to help ease political tensions and address the financial and economic crisis. As of September 11, 2012, the Oil Fund's deficit amounted to THB17.1 billion (roughly US$550 million) (Platts, 2012). However, the Thai government abstains from covering this deficit by budgetary transfers. The Energy Fund Administration Institute borrowed from commercial sources to cover the deficit, with the loan to be repaid by future collections of Oil Fund Taxes once their full rates are restored again (Thampanishvong & Laengcharoen, 2012).

In the meantime, it should be noted that Thailand has subsidized certain fuels not only through the Oil Fund, but also through other avenues. For instance, the Oil Fund subsidy to natural gas for vehicles was phased out in May 2012. But since the price of this fuel is regulated, it is the state-owned company PTT, the sole operator of natural gas vehicle (NGV) business in the country, that covers the gap between the market and regulated price.

Lessons learned:

- The Oil Fund has been an important tool to help Thailand transition to a higher level of energy prices gradually.
- Thailand had positive experiences avoiding Oil Fund deficits during periods of both financial crisis (1997) and oil price hikes (2008) as it was using complementary policies to address the social causes.
- Thailand also had negative experiences running significant Oil Fund deficits during the periods of both oil price hikes (2004–2005) and the global financial crisis (2008–2012).
- In order to cover the Oil Fund deficit, Thailand's decision to borrow money from commercial sources instead of resorting to another budgetary transfer introduced additional incentives for managing the Oil Fund more efficiently.

Gradual transitions can be more or less difficult, depending on the country's starting position toward decontrolling energy prices. But commonly for all cases, longer-term pricing reforms require similar long-standing commitments in the areas of managing impacts of energy subsidy reform (see Chapter 3, Managing Impacts) and stakeholder consultations and government communications (see Chapter 4, Building Support for Reform).

2.7 What Can my Country Do to Address Oil Price Volatility?

De-subsidizing energy exposes a country to higher and more volatile energy prices. Therefore, new pricing policies can address this consideration in several ways:

- Through increasing transparency and availability of information on price composition, which will help reduce speculative volatility and price collusion in the market.
- Through the use of smoothing automatic pricing mechanisms (see the case studies on Thailand and South Africa).
- Through variable taxation (see the case studies on China and France), including using specific taxes (with a fixed rate per litre) rather than ad valorem ones (with a rate linked to the percentage of the fuel price).

BOX 13

SOUTH AFRICA'S APPROACH TO MANAGING OIL PRICE VOLATILITY

South Africa's Basic Fuels Price (BFP) approach to stabilizing energy prices on the domestic market is considered to have functioned well over the years (Baig, Mati, Coady & Ntamatungiro, 2007). However, it should be noted that, due to the sanctions against Apartheid before 1994, the country's energy market initially operated at high-level prices. Therefore, South Africa's experience is likely to be more transferable to the economies with energy prices that are already at a high level.

The BFP was introduced in South Africa in 2003. The BFP formula was the product of a signed agreement between the Department of Minerals and Energy and members of the South African Petroleum Industry Association, and addressed concerns over oil price volatility and possible hikes in fuel prices due to speculation or price collusion. Based on the BFP formula, the prices of all grades of petrol, diesel and illuminating paraffin are adjusted on the first Wednesday of each month. The BFP draws on ex-refinery prices in U.S. dollars from major export-orientated refining centres in the Mediterranean area, the Arab Gulf and Singapore. It includes fixed amounts for (Department of Energy of South Africa, n.d.):

- Shipping and storage costs
- Taxes and levies
- Wholesale and retail margins
- Inland transport fees
- Secondary distribution, handling and storage fees

The amounts of price change are determined and implemented in such a manner that over- or under-recoveries incurred during the previous period caused by price movements are cleared in the following period. The approach has the advantage of smoothing domestic fuel prices without providing subsidies.

South Africa also addresses energy price volatility concerns by consistent transparency and enforcement of its pricing policies. The price structure of petroleum products is published regularly on the website of the Department of Energy, and the fuel prices themselves are reported daily in newspapers. The entire downstream value chain is highly regulated, with the profitability of refiners, marketers and service stations all being administered through regulation, thus avoiding opportunities for speculation or price collusion (Crompton, Maule, Mehlomakulu, Rustomjee & Steyn, 2006).

Lessons learned:

- If balanced around the average fuel-price level, which is high enough, automatic pricing mechanisms can significantly reduce price volatility without providing subsidies or accumulating debts.
- Transparent and fully enforced pricing policies help eliminate opportunities for speculation and price collusion, thus reducing energy prices on the domestic market.

SMOOTHING DIESEL AND GASOLINE PRICE HIKES IN FRANCE

BOX 14

Against the general background of a slow economic recovery from the global finance crisis, rising prices for gasoline and diesel are of increasing concern in France. Growing fuel prices are contributing to the decline in purchasing power, undermining consumption, which is the main driver of the French economy. Of particular concern for France is the price for diesel, which is used by 80 per cent of motorists in the country.

During his election campaign in 2012, the Socialist party's François Hollande promised to address the problem of rising fuel prices, and this commitment became an action item when Hollande took the presidential office. On August 28, 2012, Finance Minister Pierre Moscovici announced that, in a meeting with fuel industry representatives, the government had reached an agreement under which gasoline and diesel prices at the pump would fall by up to €0.06 per litre. Of that, €0.03 are cut at the expense of oil companies, and €0.03 through reduction of the fuel tax (called taxe intérieure de consommation sur les produits énergétiques). The agreement took effect within 24 hours and remained in place for the subsequent four months (Horobin & Parussini, 2012). On December 1, 2012, the tax cut was reduced to €0.02 per litre and was completely phased out on January 11, 2013 (Lomas, 2012).

The estimated cost of this temporary tax to the French government is €400 million in foregone revenue. In the meantime, France faces the task of finding more than €30 billion in budget savings in 2013 to meet its deficit target (Reuters, 2012b).

Lessons learned:

- Reducing fuel taxation on a temporary basis can help smooth fuel price increases.
- No type of pricing regime is immune to political interference.

2.8 Once I Have Changed my Pricing Mechanism, Are Subsidies Gone Forever?

Back-sliding and the re-introduction of subsidies after price reform is an ever-present risk. This can occur at any stage, but is considerably less likely if a country manages to achieve good practice across the four dimensions of subsidy reform: de-subsidized, full and automatic pass-through, transparent and law-abiding. In a survey of 51 developing countries, Baig et al. (2007) found that, as energy prices were on the rise during the period between 2003 and 2006, 28 countries adjusted their domestic energy in an ad hoc manner, which in several cases led to prolonged price freezes and large fuel subsidies. Further, seven out of the eight countries that used automatic pricing mechanisms suspended them, mainly to limit increases in retail prices. In contrast, none of the 15 countries that had a liberalized fuel pricing system subsequently abandoned it during the same period.

There are other aspects to making energy subsidy cuts irreversible and independent from politics. Pricing institutions will often need to be created or strengthened, thus separating out pricing authorities from political leadership. For this to be credible, the transparency and enforcement of rules may need to be improved. It is also important to shift attitudes in countries where prices have been controlled for a long time and are therefore perceived to be a matter of government discretion—awareness must be raised that prices are determined by the costs of demand and supply (see Chapter 4, Building Support for Reform). And public demand for subsidies can be reduced by developing alternative administrative capacity for providing social and economic assistance in response to energy price volatility, or indeed any other times of economic hardship (see Chapter 3, Managing Impacts).

2.9 Summary: "Do's" and "Don'ts" for Getting the Prices Right

While the experience of each country's energy pricing reforms is unique, the material discussed in this chapter makes it possible to compile a list of "do's" and "don'ts" for policy-makers who are designing and applying pricing policies to reduce fossil-fuel subsidies in their countries.

✓DO's

✓ **Do give preference to a gradual approach to energy price reform**, because it allows time for proper stakeholder consultations, comprehensive policy communications and avoiding the most negative impacts on vulnerable groups as well as hasty policy mistakes in general.

✓ **Do design energy pricing reform incorporating the four key dimensions needed to secure long-term success:**

- Reducing the burden of subsidies on government budgets, for example, by targeting subsidies
- Reducing the government's role in energy price formation, which implies:
  - For countries with ad hoc subsidies, switching to automatic pricing as an interim reform step
  - For countries with automatic pricing, abandoning it in favour of a fully liberalized market
- Improving transparency of energy price composition and regulation
- Improving enforcement of energy price regulations: promoting competition; building institutions and capacity to implement the official regulations and to prevent subsidized fuel abuse, theft and smuggling, the emergence of black markets and price collusion.

✓ **Do look at options to reduce prices that focus on the fundamentals of energy supply and demand.** This could include policies targeting the components of the marginal cost of energy supply—the costs of energy production, transportation and distribution—and efforts to improve energy efficiency. A fundamental part of this picture is the promotion of intense competition in a market with a level playing field. Other avenues for reducing energy costs might also include: improved efficiency of distribution channels; incentivizing the exploration and exploitation of new energy sources; reducing wasteful energy consumption; the installation of efficient and competitive energy-producing capacity within national borders; and better enforcement of anti-collusion rules.

⊗DON'Ts

⊗ **Don't look for a "secret formula" for the energy price that would allegedly correspond to a certain level of country's development.** By and large, for any particular country the right price of energy is equal to the marginal cost of energy supply to that market, and this price can be quite high. Any attempt to reduce this price through government subsidies simply moves the cost onto the country's population in a different way. Even in cases of energy-abundant countries, energy subsidies result in debts as present generations deplete the finite resources that would otherwise sustain future generations.

⊗ **Do not think of energy price reform as a stand-alone issue.** Changing energy prices always requires complementary polices and is easier if designed in the broader context of modernization efforts. Case studies suggest that **a fast move to market-based pricing is more likely to succeed if it is part of much bigger political and economic transformations**. For the same reason, do not expect any pricing policy, especially if it has been designed as an emergency, to function well without proper preparations, such as those discussed in this chapter as well as Chapter 3, Managing Impacts and Chapter 4, Building Support for Reform.

CHAPTER 3
MANAGING IMPACTS

This chapter discusses the qualitative and quantitative methods that policy-makers can use to project the impacts of fossil-fuel subsidy reform, as well as the packages that they can develop to mitigate these impacts. Common impacts and mitigation measures from case studies are also presented.

It answers the following questions:

- How do I project the impacts of fossil-fuel subsidy reform? Including...
  - What qualitative methods can be used to project impacts?
  - What are the commonly observed impacts of reform?
  - What quantitative methods can be used to project impacts?
- How do I identify which impacts require a mitigation measure?
- How do I identify potential mitigation strategies measures and assess their impacts? Including...
  - What mitigation measures are commonly used to manage the impacts of reform?
- What is the role of monitoring and adjustment?

It concludes with a list of "do's" and "don'ts" for policy-makers in projecting and managing impacts.

For a more detailed description of statistical modelling exercises that can be used to quantitatively project the impacts of fossil-fuel subsidy reform, and their various characteristics, see Appendix B, Modelling the Impacts of Fossil-Fuel Subsidy Reform.

Improved economic, social and environmental prosperity is the entire rationale for fossil-fuel subsidy reform. But within the larger picture of overall gains, there may be unwanted negative consequences—for key macroeconomic indicators, such as inflation; for economic sectors, such as transport or agriculture; or for particular social groups, such as low-income households or people living in certain geographical areas.

In response to a crisis, mitigation measures are often thought of as the best short-term strategies and tools that can be quickly assembled to help cope with a specific price increase. But it is often the lack of better assistance mechanisms that gives rise to subsidies in the first place. In the long term, reform can be thought of as the transition from a basic, inefficient subsidy-based economic and social assistance system, to a more strategic, targeted and sophisticated one. Otherwise, it is likely that any individual price increase, no matter how successful, will only represent a short-term victory over subsidies, to be back-slid upon when economic conditions worsen or international prices rise again.

Economic and social assistance mechanisms, however, must be established with great care. Not all impacts of subsidy reform require long-term support. And alternative policies can be vulnerable to the same weaknesses as subsidies: high expenditure, inefficiency and poor targeting. It is necessary to set out clear objectives and to choose the least distortionary tools to achieve them, taking into account administrative and political realities. If successful, this can represent a significant investment in the capacity of a government—and offer development gains that justify the risks of reform.

For planning in both the short term and the long term, the same basic process can be followed, as set out in Table 6. There is no fixed timeline for this process; it will depend upon the time and resources available to the reformers. Ideally, plans should be prepared carefully in advance of reform, and not rushed to take advantage of a sudden window of opportunity. If it is not possible to do everything, reformers are recommended to focus on the impacts of greatest concern.

TABLE 6 | PROCESS FOR DESIGNING IMPACT MITIGATION POLICIES

Steps	Activities	Page
1. Project the impacts of subsidy reform	Map out expected impacts of reform. Select assessment approach to estimate effects quantitatively, and supplement with qualitative analysis. Collect data and analyze. Ideally, conduct alongside consultation with key stakeholders (see Chapter 4, Building Support for Reform).	43
2. Identify impacts that need mitigation	Identify impacts that must be mitigated, either due to effects on the economy, businesses or households; or to make reform politically feasible. Distinguish which impacts require temporary measures and which require ongoing measures.	54
3. Identify potential mitigation measures and reassess impacts	Identify measures that could be used to mitigate unwanted impacts. This should take into account: i) reducing subsidies in a way that minimizes negative impacts (e.g. timing, the size of price increases, staggering reform for different fuels etc.); ii) alternative economic and social assistance mechanisms; and ii) policies that counteract price increases. Reassess impacts of reform, but assume the existence of suggested mitigation measures. Finalize choice of mechanisms based on quantitative and qualitative assessment.	54
4. Prepare chosen mitigation strategy	Develop capacity to deliver mitigation strategy. Depending on the context and the complexity of the policies, this may be a considerable task that takes several years. A two-track strategy may be needed: responding to short-term crises, while developing capacity to fully reform subsidies in the long term.	57
Subsidy reduction or change in pricing mechanism takes place		
5. Monitor and adjust	Monitor impacts after reform and the performance of mitigation measures following their introduction. Adjust as necessary.	62

3.1 How Do I Project the Impacts of Subsidy Reform?

There is nothing intrinsically different about projecting the impact of fossil-fuel subsidy reform as compared to any other structural economic reform. A number of methods are available to determine how such changes will affect an economy and the different groups within it.

Generally, methods can be categorized into either qualitative or quantitative approaches. They tend to have very different strengths and weaknesses and complex methods will not necessarily project every impact better than simple ones. The GSI recommends that a mix of methods should be used, selected to provide a comprehensive assessment that includes **economic, social** and **environmental** impacts and that seeks to identify how specific parts of the economy will be affected, such as **fiscal and macroeconomic impacts**, and impacts on the welfare of **households** and **businesses**.

In all cases, a mixture of quantitative and qualitative methods is advised, since a number of impacts—such as energy access or impacts on the informal sector—are not usually captured by statistical methods. Where governments have the time, resources and good data, the GSI recommends that they make use of a range of both simple and complex statistical modelling methods. Where resources, time and data are limited, the GSI recommends that, as a minimum, it is good practice to use simple methods that estimate impacts on household incomes and that take into account existing reform analyses.

BOX 15

ACCENTUATING THE POSITIVE

When considering how to project the effects of subsidy reform, it is easy for discussion to become dominated by concerns about negative impacts. Policy-makers should not forget that the entire rationale for subsidy reform is to achieve net positive impacts. Methods to project the impacts of reform are not, then, just about identifying negative effects on the vulnerable. They can also be used to help articulate the case for reform in the first place: how much GDP is expected to grow following efficiency gains; how much air pollution will be reduced and the associated gains in public health; or the extent to which vulnerable households or key economic groups, following the introduction of mitigation measures, might stand to gain. In and of itself, a transparent and convincing assessment can serve to increase the credibility of a government's plans for reform.

3.1.1 Qualitative Assessment

The first step in any assessment exercise is a qualitative exploration of the problem: identifying likely impacts, and identifying groups and issues of key concern. Highlighting particular groups that will be most affected can also be useful in ensuring that analysis adequately accounts for outliers from the norm. In situations where reform must be implemented at very short notice, qualitative assessment can at least set out concerns and prepare policy-makers for likely responses to the price increase.

Qualitative methods can go some way towards projecting the likely impacts of reform, but, alone, they are unlikely to allow for the informed design of mitigation options, as they cannot project the expected magnitude of impacts. They may be needed, however, to help feed data into quantitative exercises or to answer questions that quantitative methods cannot adequately explore: for example, interviews providing data on preferences for fuel-switching; focus groups and expert assessment to identify impacts on the informal economy; or exploring the impact of interventions across sectors, in cases where statistical modelling approaches cannot provide a solid quantitative estimation.

A range of qualitative methods is summarized in Table 7, overleaf.

TABLE 7 | QUALITATIVE APPROACHES TO ASSESSING IMPACTS OF SUBSIDY REFORM

Method	Data and resources	Advantages and disadvantages
Checklist approach: Working through a list of common impacts to identify possible risks.	Generic checklists identifiable in policy literature. See pp. 46-47 for GSI checklist. Minimal time and resources required.	Structured approach to thinking through possible risks. Will fail to capture factors that are highly country-specific.
Review of literature: Identify impacts and stakeholders as identified in studies, news media, etc.	Academic and policy analysis, news media. Minimal time and resources required.	Helps identify existing concerns and can offer shortcuts in assessment needs, depending on quality of identified material. May miss important impacts and stakeholders.
Review of data on past reforms: Reviewing previous impacts of national price increases.	Assumes existence of data on previous price reforms. Minimal time and resources required.	Can offer good predictions of general impacts and some sense of magnitude. Usefulness will depend upon quality and age of data and prior assessments.
Conceptual mapping: Thinking through relationships between fuel prices and the rest of the economy.	Minimal time and resources required. Should involve different ministries or stakeholder representatives.	Helps articulate causal relationships. Can be a useful tool to think through issues and identify impacts previously not considered.
Identify groups most reliant on fossil fuels: Identify fuel use and expenditure among income groups and economic sectors.	Requires household consumption data and input-out (I-O) data. Minimal time and resources required.	Quickly identifies consumers most reliant on fossil fuels in an economy. Suggests which consumers will be most affected but does not estimate actual impacts. May provide poor estimates if consumption data are out-of-date or otherwise unreliable.
Stakeholder consultations: Seek inputs from experts and key affected groups.	Time and resources directly related to breadth of consultations.	Can identify issues and concerns that may not be on policy-makers' agendas and can explore social perceptions and practical responses to policy options. Can also build support for reform and mitigation packages. May risk stoking political opposition. See more on consultations in Chapter 4, Building Support for Reform.
Scenario analysis: Identify and discuss broad outcomes given various future conditions and government interventions.	Time and resources dependent upon complexity of the analysis.	Helps identify key risks and liabilities of subsidy policies under different assumptions of businesses-as-usual trends. May fail to take into account complex impacts without quantitative input.

Source: GSI

3.1.2 A Checklist: Common Impacts from Reform Case Studies

The impacts of fossil-fuel subsidy reform are never exactly the same. They depend on many variables: the fuels being subsidized, the size and frequency of price increases, and so on. They also depend on the individual context: what challenges already face the economy, businesses and households? Nonetheless, there are a number of "usual suspects"—impacts that occur time and again in reforming countries.

The most common impacts are summarized in Box 16 and as checklists in Tables 8 and 9, overleaf, including both positive and negative effects. The first checklist summarizes broad, generic impacts across an economy, while the second summarizes fuel-specific impacts. Not all items in the lists will apply to every subsidizing country, but they provide a useful reminder of possible impacts to consider in a planning process. **The lists are drawn up assuming that none of the savings from subsidy reform have been reallocated to managing impacts.** See pp. 54-60 for information on mitigation measures.

BOX 16

COMMON IMPACTS OF FOSSIL-FUEL SUBSIDY REFORM

Generally speaking, the **most immediate impact of any reduction in subsidies will be financial.** The exact form of the impact will depend on how the subsidy is conferred. Governments that spend large amounts of the state budget will recoup those costs; state or private energy companies that underprice fossil fuels will reduce or eliminate related losses; and increased revenues might be raised from domestically produced fuels that were previously being sold at the cost of production.

At a macroeconomic level, the reduction of subsidies can have a mix of positive and negative impacts. In the short term, increased energy prices cause a shock to GDP and increase inflation. Allowing price changes to pass-through into domestic prices exposes the economy to international price volatility. By the medium term, however, more accurate pricing would be expected to result in better resource allocation, leading to higher GDP growth, and inflationary effects would subside. Any fiscal savings would result in a better trade balance and current account. And price volatility would be expected to promote more rational behaviour regarding fuel consumption.

There can be a range of governance benefits: Energy security might increase as higher prices dampen consumer demand for fossil fuels and provide a better environment for investors in the energy sector. The elimination of a subsidy policy can also remove opportunities for corruption and "gaming" of the system, such as through fuel smuggling or adulteration. If governments move to market-based pricing, it can also introduce some new governance risks, however, such as cartel pricing.

A mix of impacts can also be expected on businesses and households. Energy-intensive businesses might suffer from reduced international competitiveness. But if reform improves the finances of energy companies and creates a more level playing field—as is often the case when cost-covering prices are introduced for power companies—then businesses can benefit, as increased maintenance and investment in the energy sector leads to an extended and better quality energy supply. Reform will usually have a progressive impact for households in a relative sense, since most subsidies benefit the rich more than the poor. In an absolute sense, however, reform can increase poverty. Effective incomes would be expected to go down in the short term, as price increases push up living costs, and, unlike richer households, the poor struggle to adapt. Some households can suffer from reduced energy access if energy becomes more expensive and there are no affordable alternatives; at the same time, other households can have improved energy access, due to expanding distribution and improved quality of services.

Finally, reform can result in either negative or positive environmental impacts, depending on how fossil-fuel use changes. If consumers switch to use more polluting fuels, GHG emissions and local pollution can increase. Switching to traditional biomass fuels can increase pressure on forest resources. On the other hand, if subsidy reform leads to the take-up of less polluting fuels, increased energy efficiency and investments in renewable energy, it can result in improved environmental outcomes.

TABLE 8 | ASSUMING NO MITIGATION MEASURES: CHECKLIST OF COMMON IMPACTS OF FOSSIL-FUEL SUBSIDY REFORM

Negative		Positive
Financial		
		Positive • Reduced expenditure, more "fiscal space" • Debt reduction • Higher income for state energy companies
Macroeconomic		
Negative • Short-term shock to GDP • Short- or medium-term rise in inflation • Increased vulnerability to volatility	 ...but → ...but → ...but →	**Positive** • Better trade balance and current account • Higher GDP growth in medium term • Prices fall by the medium term • Full demand response to price changes
Governance		
Negative • Risk of anti-competitive practices and insufficient competition in new fuel-pricing market • Reduced incentive for fuel smuggling		**Positive** • Increased energy security: decreased demand and more incentives for investment • Reduced opportunities for corruption
Businesses and economic sectors		
Negative • In short term, reduced international competitiveness of fossil-fuel-intensive sectors, e.g.: – Agriculture and fisheries – Energy-intensive industries – Transport services		**Positive** • In medium term, more stable energy supply: – More level playing field – Improved finances of energy companies – Increased incentive to invest in energy production and infrastructure – Better incentives for energy efficiency
Households and social welfare		
Negative • Overall regressive impact, if most previous subsidy benefits went to poor • Reduction in household incomes • Lower wages and unemployment associated with affected business sectors • Increase in poverty • Reduced energy access, if households unable to afford other fuels	...OR... ...OR...	**Positive** • Overall progressive impact, if most subsidy benefits previously went to rich • Increased energy access, if proper pricing allows for increased distribution and quality
Environment		
Negative • Increased GHG emissions and local air pollution, assuming fuel-switching to more polluting fuels, despite improved efficiency • Increased pressure on forest resources, assuming switch to biomass	...OR... ...OR...	**Positive** • Reduced GHG emissions and local air pollution, assuming fuel-switching to less polluting fuels and energy improved efficiency • Increased use of renewable energy, as it becomes more competitive

TABLE 9 | ASSUMING NO MITIGATION MEASURES: CHECKLIST OF COMMON FUEL-SPECIFIC IMPACTS

Gasoline	
• High fiscal savings	Gasoline subsidies, along with diesel, often represent the largest percentage of subsidy expenditure.
• Income effect concentrated on higher-income households	Low-income households cannot afford vehicles. Typically, gasoline subsidies are almost entirely captured by highest income groups, e.g., in Indonesia, the poorest 20 per cent receive less than one per cent of gasoline subsidy expenditure.
Diesel	
• High fiscal savings	Diesel subsidies, along with gasoline, often represent the largest percentage of subsidy expenditure.
• Inflation and indirect impacts	Diesel tends to be an important intermediate input in economic sectors. Reform of diesel prices may therefore cause price increases for a range of other goods in the economy too. Although low-income households are unlikely to consume diesel directly, these indirect impacts may make them sensitive to diesel subsidy reform. The potential to cause a broad set of price increases also means that the reform of diesel subsidies is more likely to have an inflationary impact than other fuels.
• Increased costs for businesses	Due to its importance as an intermediate input, diesel may have a broader impact on businesses than other fuels.
LPG and Kerosene	
• Income effect is significant for lower-income households	In low- and middle-income countries, particularly where electrification rates are low, kerosene is often important for low-income households. LPG plays a similar role in some countries. Reforming subsidies on these fuels may therefore have higher income effects on the poor.
Electricity (via reform of subsidies on fuels used as inputs, e.g., coal, natural gas, gasoline and diesel)	
• Inflation and indirect impacts	Electricity is an important intermediate input in economic sectors. Reform of fossil-fuel subsidies that affects diesel prices may therefore cause price increases for a range of other goods in the economy too. Depending on the extent of electrification, low-income households may consume electricity and be affected by both the direct price increases and indirect effects on the prices of other goods. The potential to cause a broad set of price increases also means that the reform of subsidies that affect electricity is more likely to have an inflationary impact than other fuels.

Source: based on a review of literature on reforms covering over 21 countries, including GSI (2012); Aramide et al. (2012); Beaton & Lontoh (2010); Breisinger, Engelke & Ecker (2011); Burniaux, Chanteau, Dellink, Duval & Jamet (2009); Clements, Jung & Gupta (2003); Coady, Gillingham, Ossowski, Piotrowski, Tareq & Tyson (2010); Coady & Newhouse (2006b); El Said & Leigh (2006); Ellis (2010); del Granado, Coady & Gillingham (2012); Hassanzadeh (2012); International Monetary Fund (IMF) (2008); IMF (2012); Kojima (2009); Laan (2011); Mendoza (forthcoming); OECD (2011); de Oliveira (2010); Solanko (2011); Soni, Chatterjee & Bandyopadhyay (2012); Suwala (2010); Yusuf, Komarulzaman, Hermawan, Hartono & Sjahrir (2010).

3.1.3 Quantitative Assessment

Quantitative methods are a powerful tool: they can project the magnitude by which economic actors will be affected, allowing for the design of targeted mitigation measures. If sufficiently complex, they can also project the outcome of complicated impacts and responses interacting across an economy. And they can play an important role in the political economy of convincing internal and external stakeholders that subsidy reform is necessary and can be achieved without undue economic stress.

Different models have different capabilities and offer very different levels of detail. Some of the most important characteristics by which analyses can vary are summarized below.

Direct, indirect and induced effects

- *Direct effects* result from a rise in the price of the fossil fuel: how much will it increase in price? How will this influence the effective incomes of firms and households?
- *Indirect effects* result from a rise in the price of other goods and services, which use the fuel as an input. How will this change effective incomes?
- *Induced effects* are caused by changes in supply and demand due to changed effective incomes.

First-order effects versus fully mapping out chains of causation

- An estimate of *first-order effects* assumes that no market actors change behaviour in response to price increases. For example, it would estimate how higher-priced fossil-fuel inputs would increase the cost of doing business, and assume that businesses would simply have to absorb these costs.
- Estimates of *further orders of causation* consider how each impact could have its own effects. For example, higher-priced fossil-fuel inputs might cause businesses to reduce costs by firing workers. Rising unemployment could reduce average household expenditure, again affecting businesses.

Static versus dynamic impacts

- *Static models* project the outcomes of subsidy reform to one fixed period in time.
- *Dynamic models* project the outcomes of subsidy reform across time, allowing policy-makers to identify short-, medium- and long-term impacts in a single statistical model.

Aggregated versus disaggregated

- *Aggregated impacts* estimate net effects across the entire economy. Inputs can also be aggregated—for example, many models treat gasoline, diesel, LPG and kerosene as one common variable "fuel."
- *Disaggregated inputs and impacts* allow for a focus on discrete components in an economy. The extent of disaggregation can vary significantly: for example, from estimating impacts on all households to estimating impacts on households by income bracket or geographical location.

Ability to model impacts on energy use and associated environmental and social implications

- *Changes in energy use* are likely to take place as a result of fossil-fuel subsidy reform, and different models will be more or less able to project impacts such as switching to use different fuels, reduced energy access, improvements in energy efficiency and changing levels of resource stocks.
- *There will be social and environmental impacts* of changing energy use. It may also lead to reduced energy access, influencing households'—particularly women and children's—economic and educational opportunities. If consumers switch to use biomass fuel, it can also cause respiratory problems, opportunity costs related to fuelwood collection and increased rates of deforestation (World Bank, 2010). Depending on how consumption changes, it may also increase or decrease levels of pollution.

It is generally preferable to opt for methods that estimate direct and indirect impacts of fossil-fuel subsidy reform, unless there are strong reasons to assume that indirect impacts will be minimal. Empirical evidence shows that indirect impacts are often as large, if not larger, than direct impacts (del Granado, Coady & Gillingham, 2012). This is because many fossil fuels—particularly diesel or any fuel that affects electricity prices—are used as inputs in a range of economic sectors.

Given the complex impacts that fossil-fuel subsidies can have across an economy and through time, the GSI recommends that, where possible, projects should allow for a comprehensive and dynamic accounting of different orders of cause and effect, including a detailed understanding of changing energy use. Typically, statistical models will allow for behavioural responses in some areas but not others. This means they may need to be adapted or more than one model may be required to explore impacts fully. Simple, static first-order models can, however, still be useful, providing a rough and usually well-disaggregated estimate of effects on households and businesses immediately after reform.

Having sufficiently disaggregated data is ideal in order to provide the most useful information. Key areas in which data should ideally be disaggregated include by fossil-fuel type, household incomes and key economic sectors.

Disaggregating data by fuel type and by household income is important because different fossil fuels can affect the wealthy and the poor in very different ways. In Egypt, for example, disaggregation shows that gasoline- and natural-gas-subsidy reform would increase household expenditure by 0.0 per cent and 0.1 per cent, respectively, for the poorest quintile, while reform of kerosene and LPG subsidies would increase expenditure by 2.2 per cent and 5.4 per cent, respectively, for the poorest quintile (World Bank, 2009). It may also be useful to disaggregate consumers by other characteristics. Typically, research shows urban consumers are hardest hit by reforms (Clements, Jung & Gupta, 2003; Hope & Singh, 1995). This may be because they have less access to traditional fuels. Analysis might also focus on characteristics such as geographic areas, gender, livelihood, ethnicity or religion (World Bank, 2003). For similar reasons, it is important to ensure that key economic sectors are disaggregated, particularly energy-intensive industries (Ellis, 2010). In particular, employment in key economic sectors may be a key variable to assess. Informal sectors will not be captured in standard economic databases. Qualitative analysis is therefore likely to be needed to assess impacts on the informal economy.

Models must not confuse "energy efficiency" and "energy conservation" impacts with reduced energy access. As emphasized by Markandya and Hunt (2003), access problems can have significant, unmeasured social impacts. These problems can include risks and opportunity costs associated with the collection of alternative fuel, lack of lighting for education, indoor air pollution and health problems associated with inadequate heating. The environmental impacts of increased biomass use may also be poorly captured by most statistical models. In Senegal, for example, LPG subsidies were originally introduced to reduce pressure on forests, so reform has been complicated by the need to protect forest resources without denying energy access to the poor (Laan, Beaton & Presta, 2010). Depending on the capabilities of available statistical models, qualitative analysis may be required to assess such impacts.

Resource stock impacts are relevant for fossil-fuel-producing countries. They take place where rising prices cause a sufficiently high reduction in domestic demand to bring about a reduction in total fossil-fuel production. This may prove desirable or undesirable, depending on a range of factors. Markandya and Hunt (2003) recommend evaluating such effects by analyzing the extent to which present-day production is more or less valuable than future production (which may include exploring future resource prices); the extent to which resource wealth has been invested in capacity for future income generation, as opposed to current consumption; and the extent of opportunity costs of not selling the fuel at international market prices.

3.1.4 Which Quantitative Approaches to Use?

Three broad statistical modelling approaches are typically used to quantitatively assess the impacts of energy pricing policies and measures:

- Simple analysis based on economic databases, such as household income expenditure surveys, I-O tables and social accounting matrices (SAMs)
- Computable general equilibrium (CGE) models
- Energy sector models

The advantages and disadvantages of these models with respect to the characteristics described above are summarized in Table 10, overleaf. For more information about these modelling approaches, and how they can be applied to fossil-fuel subsidy reform, see Appendix B, Modelling the Impacts of Subsidy Reform.

Ideally, if governments have the resources, data and time, it is preferable to opt for an approach that includes all of the most complex dimensions of analysis—assessing direct and indirect impacts, fully mapping out chains of causation in a dynamic system, disaggregating fuels, economic sectors and households, and assessing changes in energy use and related social and environmental impacts. It is unlikely that any one model will be able to account for all of this, so **the GSI recommends a comprehensive assessment, including simple analysis, CGE models and energy sector models.**

Assessments may struggle to find up-to-date robust data, fail to include informal economies and include large amounts of uncertainty (see Box 17). In these circumstances, **the GSI recommends that, at a minimum, it is good practice to use simple statistical models to estimate impacts on the government's fiscal position, key macroeconomic indicators and on households.** This should be **accompanied by a range of the least data- and resource-intensive qualitative research methods,** summarized in Table 7 on p. 44, such as reviewing current literature on subsidy reform, looking at the impacts of past reforms and identifying key concerns through checklists and conceptual mapping.

WHAT ABOUT REAL-WORLD CONSTRAINTS: NO DATA, BAD DATA, TECHNICAL CAPACITY AND HIGH COSTS?

BOX 17

In the real world, there are often constraints on what is possible. The World Bank (2010) notes that, for some kinds of analysis, many countries do not have the required data; and where the requisite datasets exist, they may relate to several years in the past, be of poor quality or be disaggregated in different ways, and difficult to convert into common terms. Moreover, some of the more advanced approaches, such as CGE models and energy sector models, are time-consuming and require considerable expertise. They may not be an option for civil servants with little time or little technical expertise.

This guidebook sets out the ideal process that governments would go through in order to prepare for fossil-fuel subsidy reform. It does not mean that it is the only process and that governments who cannot use a full suite of analytical tools should give up. Policy-makers must assess which approaches are feasible and conduct preparations accordingly. The only essential thing is to be clear about what an analysis includes and what it may be missing. Ultimately, no quantitative method will perfectly project impacts. Models are a tool to aid preparation—not a substitute for critical thinking or adequate risk management.

Governments with limited capacity should also not dismiss quantitative methods too quickly. Some of the more basic, easy-to-conduct analytical approaches—for example, the Poverty and Social Impact Assessment (PSIA), as described in Box 18 on p. 52— can in fact be extremely informative. For more complex methods, most countries have domestic research institutions that have developed CGE and energy sector models and that can adapt them to fossil-fuel subsidy reform. It also may be possible to request analysis from international policy and development organizations, most of which are highly supportive of reform.

TABLE 10 | SUMMARY TABLE: QUANTITATIVE APPROACHES TO IMPACT ASSESSMENT

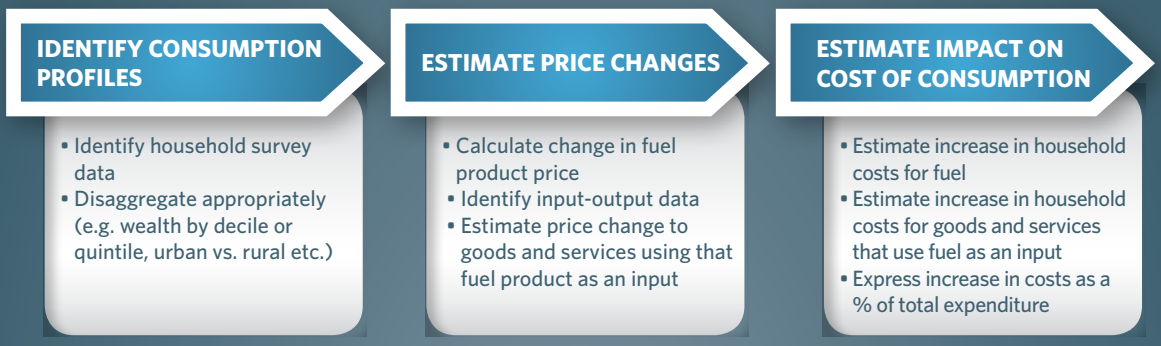
Analytical approach		Data source(s)	Captures impacts on...	Data availability and resource requirements
Simple analysis based on economic databases		Income and expenditure survey	Direct impacts only. Disaggregates energy by individual fossil fuels. Estimates static, first-order impacts on households only, can disaggregate by income group and location. Useful for poverty analysis. Does not assess impacts on informal sector, energy access or environment.	Data generally publicly available in all countries. Useful results achievable within two weeks of result of survey. Little technical expertise is required.
		Input-output (I-O) table	Direct and indirect impacts. Usually aggregates fossil fuels into a limited number of categories, separate from electricity. Estimates static, first-order impacts on households and economic sectors, with no disaggregation of households but good disaggregation of economic sectors. Does not assess impacts on informal sector, energy access or environment.	I-O tables tend to be built by national statistical agencies every 5–7 years, and can therefore be out of date. Experienced analysts are able to produce results within four weeks of receipt of table. Specialized technical expertise is required.
		Social Accounting Matrix (SAM)	Direct and indirect impacts but standard SAM does not explicitly include data fields on electricity and fuel expenditure—this requires additional calculations. Estimates static, first-order impacts on households and economic sectors, but does not usually disaggregate households. Does not assess impacts on informal sector, energy access or environment.	SAMs tend to be built by national statistics agencies or international organizations such as the World Bank every 5–7 years, and can therefore be out of date. Experienced analysts able to produce results within three months. Specialized technical expertise is required.
CGE Model		SAM and/or I-O table	Direct and indirect impacts, and typically some but not all induced impacts. Usually aggregates fossil fuels into a limited number of categories, separate from electricity. Estimates dynamic impacts of different orders of causation on households and economic sectors, with households not usually disaggregated and economic sectors not highly disaggregated. Different models will allow different variables to respond to changing economic conditions, e.g., most CGEs assume full employment and require adaptation in order to estimate employment impacts. Does not assess impacts on informal sector, energy access or environment.	SAMs and I-O tables are usually used as the core databases underlying a CGE model, and, as these are usually built every 5–7 years, they can be out of date. Also they require significant additional data, estimates of econometric relationships, assumptions and ad hoc adjustments. Can take an experienced team up to a year to build and calibrate a CGE. Existing models are likely to require adaptation to assess fossil-fuel subsidy reform. Highly specialized technical expertise is required.
Energy sector models		Energy statistics, demand and supply projects	Direct and indirect impacts for energy sector only. Can fully disaggregate individual fossil fuels. Estimates dynamic impacts on energy consumers and energy sector, ranging from aggregated to highly disaggregated. Assumes no demand response to price changes. Does not assess impacts on informal sector, energy access or environment. Can be adapted to project changes in resource stocks.	Data typically available from a number of sources and fairly up to date. Building and calibrating a new model can take an average of four months. Existing models are likely to require adaptation to assess fossil-fuel subsidy reform. Specialized technical expertise is required.

Source: GSI, drawing on inputs from Coady (2006); Markandya & Hunt (2004); World Bank (2010).

AN EXAMPLE OF SIMPLE ANALYSIS: PSIA IN GHANA

BOX 18

As described by Coady (2006) and World Bank (2003), this approach is simple and not resource intensive, estimated at only two-person weeks once the basic data have been collected and processed. It estimates changes in the price of goods and services that use fuel as an intermediate input, based on I-O data. It then feeds post-reform prices into household survey data, to estimate how they will affect the cost of an average consumption basket. The change in a household's average expenditure is then expressed as a percentage of total current expenditure, typically disaggregated by quintiles or deciles according to wealth. The analysis aims to identify first-order direct and indirect impacts with respect to the affordability of current consumption patterns. IMF routinely employs it in the course of PSIAs of fossil-fuel subsidy reform.



Source: GSI, summarizing Coady (2006).

Coady and Newhouse (2006) describe the use of this method in Ghana in early 2005, following a government request for technical assistance. The analysts began by clarifying the policy background and issues, identifying existing reports on proposed reforms and collecting data for the analysis. This included contacting academic economists with expertise on Ghana and information on important stakeholders.

Next, a technical assistance mission took place. Two experts met with the Ministry of Finance and the Central Bank to help clarify the policy context; with the Ministries of Education and Health to identify how savings could be redirected; with the Ministry of Energy to better understand energy supply, demand and policy; and, finally, with the Ghana Statistics Service to help identify data. Stakeholder consultations were not conducted, but the team did talk with a number of policy actors, including the Institute of Statistical Social and Economic Research, the Centre for Economic Policy Analysis and the authors of studies on household petroleum use and structural reforms in the petroleum sector.

Impacts on household income were then estimated using the PSIA approach described above, broken down by income group. This showed that the lowest income quintile would see consumption costs rise 9.1 per cent as a result of reforms. Indirect effects were the most important, responsible for a 6.2 per cent rise in costs. The study broke these down by sector, showing that the biggest indirect impacts derived from cost increases in the agriculture sector (3.0 per cent), manufacturing (1.3 per cent), transport (0.8 per cent) and trade (0.7 per cent). The analysis was then used to assess potential mitigation options (see Box 22 on p. 61). The results were fed into a policy debate in parliament on how to put together a package of measures to pass-through reforms.

A number of studies have applied this method to fossil-fuel subsidy reform. They indicate that the indirect impacts of fuel price reform are often particularly strong, as summarized in Table 11.

TABLE 11 | INCREASE IN LIVING COSTS FOR POOREST HOUSEHOLDS AS A RESULT OF FUEL SUBSIDY REFORM

	Direct	Indirect	Total
Bolivia	1.8%	4.1%	5.8%
Egypt	-	-	7.7%
Ghana	2.9%	6.2%	9.1%
Indonesia	-	-	5.1%
Jordan	3.0%	2.3%	5.4%
Mali	0.9%	0.9%	1.8%
Sri Lanka	1.8%	1.2%	2.9%

All data refer to the lowest income quintile, with the exception of Indonesia, which refers to the lowest decile.
Source: Coady, El-Said, Gillingham, Kpodar, Medas & Newhouse (2006); World Bank (2009)

AN APPROACH IN PRACTICE: CGE MODELLING IN INDONESIA, YEMEN AND MALAYSIA

BOX 19

There is a body of CGE modelling exercises that can be reviewed by policy-makers interested in applying this form of analysis. Illustrative studies from three different countries are summarized below.

Indonesia

The most recent CGE analysis in Indonesia was a static model conducted by Widodo, Sahadewo, Setiastuti and Chaerriyah (2012), based on a SAM published by Indonesia's Central Bureau of Statistics, and assessing the short-run impacts of reducing gasoline and diesel fuel subsidies by IDR1 billion. It identified the economic groupings most affected by reform: the chemical and cement industries; electricity, gas and drinking water; food, beverage and tobacco industries; trade; and coal, metal and oil mining. The Indonesian SAM disaggregates different types of households, so the model could project that households in urban areas and the agricultural sector would be most greatly affected. It estimated that reallocating subsidy spending would not be enough to counteract the short-term shock of reform. The authors theorized that this could reflect the limits of the model—a SAM derives economic multipliers from a dataset of transactions in a specific year, and, given Indonesia's very high subsidies, this attributes a high multiplier to fuel subsidies. The model also held prices of goods fixed, allowing for no substitution of fuel-intensive goods and services, and did not account for efficiency impacts in areas such as congestion or the regressiveness of fuel subsidies.

In an older CGE exercise, Clements, Jung and Gupta (2003) ran two scenarios that allowed the price of all goods to rise following reform. The model estimated that overall poverty levels in the economy would increase, and identified falling employment among low-income households as one of the important explanatory factors. This suggested that policies targeting employment, such as public works programs, might be needed among mitigation measures. One of the scenarios predicted that about two thirds of the impact of subsidy reform on household consumption would take place due to second-order effects, implying that many of the impacts of reform would not have been captured without factoring this into the model.

Yemen

In Yemen, Breisinger, Engelke and Ecker (2011) used a dynamic CGE model, based on a SAM, updated using data from planning, statistics, finance and agriculture ministries, as well as the IMF and the World Bank. It projected that fuel subsidy reform would cause an initial shock to GDP before improving economic growth by 0.1 to 0.8 percentage points annually. Scenarios explored the relative merits of gradual and big bang reform, projecting that an immediate price increase would cause a sharp drop in GDP and a significant spike in poverty levels, whereas gradual reform would just dampen GDP growth and cause a small increase in poverty. On this basis, the study argued that gradual reforms would be a good way to manage impacts. The model also estimated the size of cash transfer that would be needed to offset the impacts on poor households, and showed that it would be efficient to also invest some savings in utilities, transport, trade and construction sectors, as drivers for sustainable economic growth.

Malaysia

Hamid and Rashid (2012) modelled the impacts of fuel subsidy reform in Malaysia using both a static I-O model and a static CGE model, both based on I-O tables from 2005. Using two methods allowed them to compensate for each individual model's weaknesses, and explore potential impacts more fully. The study projected that reform would increase multipliers on GDP and worker income. The most affected sectors were found to be wholesale and retail, petrol refineries, electricity, gas and communication. Wages were projected to decline steadily in response to fuel price increases, which indicated that low-income households would be hit particularly hard by reform. The authors recommended that the government should explore how to use a proportion of subsidy savings to establish social protection mechanisms targeted at increasing productivity and welfare.

3.2 How Do I Identify Which Impacts Require a Mitigation Measure?

Following an assessment of impacts, it is necessary to determine which ones require a mitigation measure. In practice, this is likely to take place before the full conclusion of assessment exercises, perhaps following initial scoping exercises on the expected impacts of reform, or iteratively at several points throughout the planning process. At this time, key concerns can be identified and mitigation measures discussed, and built into quantitative modelling exercises.

The decision on which impacts need intervention will depend upon the subsidies in question, the reform objectives and the larger developmental trajectory of the country. Discussions should take into account:

- Which groups can absorb the impacts they are facing?
- Which groups require economic or social assistance because their welfare is a public responsibility or a key concern for development?
- Which groups create employment and drive the economy?
- Which groups pose the greatest political obstacles to change?
- The capacity of the government to provide support, taking into account subsidy savings, the existing capacity for economic and social assistance, and the time pressure on reform.

It is also important to consider the longevity of different impacts. For example, businesses may only experience a shock for a short term before they can adjust how they operate and use energy more efficiently. By contrast, in countries where fossil-fuel subsidies are the primary welfare mechanism, there may be a mixture of temporary and permanent impacts on the welfare of different groups.

3.3 How Do I Identify Potential Mitigation Measures and Assess their Impacts?

A package of strategies and policies is usually required to address the varied impacts of reform. Where the measures incur fiscal costs, it is often the case that subsidy savings can be reallocated to pay for them. Since alternative policies are more efficient than subsidies, and many are only short term, it is usually assumed that only a proportion of the savings will need to be reallocated.

There are three broad types of components that might make up a mitigation package:

- The strategy for *how* price rises are implemented
- Policies that provide *economic and social assistance* targeted at the impacts of price rises
- Strategies and policies that *counteract* price rises

How to implement price rises is a question of timing, magnitude and frequency, and the sequence in which subsidies for different fuels will be reformed. A "big bang" approach will immediately shock the economy. Generally, a gradual approach is preferable, phasing in price increases, restricting subsidy access to smaller groups of recipients and beginning with fuels that are least important for economic activity and social welfare. This will minimize all impacts at the opportunity cost of full and immediate fiscal savings. See Chapter 2, Getting the Prices Right, pp. 27-28 for a full discussion of the pace and timing of reforms.

Policies that provide *economic and social assistance* are focused on responding to the impacts of higher prices. This includes most measures that could be used in any context to improve macroeconomic stability, provide assistance to businesses and households, improve energy access and prevent environmental harm. In other words, the choice of policies is very often not specific to fossil-fuel subsidy reform, but rather needs to follow the same logic as any policy trying to achieve the objectives in question.

Complementary policies that *counteract* price increases are best focused on the fundamentals of supply and demand in the market for the fossil fuel. The biggest determinant of prices is the cost of the resource. But governments can also promote lower prices with strong competition policies and by addressing inefficient distribution. Some governments have counteracted price increases by temporarily reducing taxes and fuels on fees (IISD-GSI, 2012). Although this is another form of subsidy that may be hard to reverse, it is less of a liability than setting fixed prices if it allows for full pass-through of international price fluctuations.

FIGURE 8 | AREAS FOR MITIGATING THE IMPACTS OF REFORMS

3.3.1 Taking into Account Stakeholder Perceptions and Government Credibility

When it comes to the choice of mitigation measures, stakeholder perceptions matter. There may be greater or smaller amounts of support for different kinds of measures, with ramifications for their effectiveness and the political feasibility of reform. For these reasons, it is good practice to hold consultations or otherwise assess stakeholder views around mitigation options (for information on assessing stakeholder views, see Chapter 4, Building Support for Reform, pp. 74-77).

One issue of perceptions is often witnessed in countries that are fossil-fuel producers. Typically, citizens in these countries consider subsidies to be form of "resource dividend," their share of national energy wealth. Mitigation policies that fail to maintain this linkage may be rejected. For example, there is no clear visible connection between reducing school fees and receiving a share of resource wealth. In Mexico, it has been argued that energy subsidies should be replaced with unconditional cash transfers called "resource dividends." This would eliminate the market distortion of the subsidies but still give the general population a clear sense of a "share" in their country's natural resources (Segal, 2012).

Another common concern in some countries is credibility. Where trust in government is low, stakeholders may be wary of mitigation measures that can be easily rolled back or captured by corruption. They may not believe that proposed measures will be implemented at all. For example, in Nigeria, endemic corruption has resulted in very low levels of trust in the government's Subsidy Re-investment and Empowerment Programme (SURE-P), which sets out a comprehensive set of measures to mitigate the impacts of subsidy reform (Onyekpere, 2012).

It has been suggested that the sequencing of mitigation measures could be one way to overcome these problems: by organizing and implementing mitigation measures before reform takes place, businesses and households will have material evidence that promises of compensation can be trusted (Aramide et al., 2012; Guillaume, Zytek & Farzin, 2011). In addition to sequencing, key tools to build trust are transparency around reform plans—including consultations—and pursuing a gradual pace of reform.

BOX 20

KEY ISSUE: SUBSIDY REFORM AND INFLATION

Inflationary impacts are a key concern commonly voiced about fossil-fuel subsidy reform. As outlined in the sections above, reform will often increase the prices of fuel products and have knock-on effects on the prices of goods and services that use the fuel as an input. These broad-based price increases will affect the cost of a household's average consumption basket—in other words, increasing inflation.

- In Indonesia, the Central Bank has estimated that plans to restrict access to subsidized gasoline and diesel would push up non-core inflation by 0.6 to 0.9 per cent (Antara News, 2012).
- In Thailand, Credit Suisse has estimated that a permanent 10 per cent increase in the retail price of diesel would increase headline inflation by seven tenths of a percentage point in a year (Sriring, 2011).

While an inflationary impact is to be expected in the short term after a price increase, this should subside by the medium term, and subsidy reform is customarily expected to provide net economic gains in the medium-to-long term: economic actors paying for the subsidy will be in a more balanced fiscal position, accurate pricing will lead to a better allocation of resources, and the perverse effects of subsidies, such as high government debt or under-investment in the energy sector, will no longer burden the economy.

Nonetheless, the complete reform of subsidies may increase exposure to inflationary pressures at a structural level due to oil price volatility: in a system with market-based pricing, international price changes will be passed through directly onto national consumers, altering the cost of living. There is no easy answer to managing the impacts of price volatility—though it is clear that subsidies are not a solution. Inflationary impacts may also become more of a concern for countries implementing a gradual phase-out of subsidies. Although the inflationary impact of each individual price increase should subside by the medium term, a series of small price increases can lead to impacts that, taken together, last into the medium term. This can create a perverse outcome known as "anticipatory inflation": once workers become accustomed to a certain background rate of inflation, they may come to routinely demand wage increases in expectation that the cost of living will increase on an ongoing basis. This can in turn prevent inflation from falling, even once subsidy reform is over.

Many countries try to minimize inflationary impacts by increasing prices during periods of low seasonal inflation. A number of Asia-Pacific economies have combined subsidy reform with temporary reductions in taxes and fees on fuel to counteract the immediate price increases (GSI-IISD and APEC, 2012). Some countries have also tried to stem inflation by pushing the burden of price increases onto producers—for example, in China the government did not allow transport prices to rise when fuel prices were increased (IISD-GSI, 2012), and the Philippines places price controls on Jeepneys, the flamboyantly coloured jeeps that are the most popular form of public transportation in the country (Mendoza, forthcoming). This approach comes with its own costs, however, as the transport sector may struggle to cope with the rising cost of doing business and often mounts strident opposition to subsidy reform if prices are controlled.

3.3.2 Planning for the Short and Medium Terms

Mitigation measures may need to be considered across the short and medium terms.

Many policy-makers will approach subsidy reform from a short-term perspective, with the objective of achieving a specific price increase, often driven by the desire to reduce subsidy expenditure. The priority is to push through this price increase, and to do so in the near future, while political will is still strong or a window of opportunity is still open. In this situation, they will focus on mitigation measures that use existing capacity, or at the most on measures that can be quickly organized and implemented.

However, some impacts of subsidy reform will continue beyond the initial price increase and therefore investments in mitigation measures over the medium term may be necessary.

Sometimes this will be clear simply from the challenges inherent in managing impacts: where effects on businesses and households will be significant, major investments may be needed to create the capacity to provide targeted assistance. This can be another argument for a gradual approach to reform with careful sequencing—it gives the government time to organize more complex mitigation policies.

A medium-term view may also be needed where there are reasons to assume that subsidies are in fact a structural feature of the economy. Analysis of the political economy of subsidies concludes that, in many countries, subsidies are used simply because of a lack of other administrative options for providing economic and social welfare (Victor, 2009). This helps explain why some countries struggle with subsidy reform for many years: pushing through a price increase one year; but back-sliding the next, or finding the cost of subsidies increase again simply due to rising international fossil-fuel prices. In such circumstances, subsidy reform can be seen as a transition from a basic, inefficient economic and social assistance system, to a more strategic, targeted and sophisticated one. Such a shift is likely to require a significant degree of capacity-building. Medium-term planning will set out the steps that need to be taken to achieve the transition, paving the way for future price increases, and allowing subsidization to be abandoned for good.

3.3.3 A Checklist of Mitigation Measures from Case Studies of Reform

There is no standard package for mitigating the impacts of fuel subsidies. The measures that are employed will depend upon the fuels being subsidized, the impacts predicted and the capacity of the government in question. The following figures summarize the strategies and policies that have been either proposed or implemented for fuel subsidy reform.

Inclusion of a measure should not be confused with its recommendation. For example, many countries have tried to mitigate the impacts of fuel price increases by cross-subsidizing kerosene and diesel—the result of which is typically large-scale adulteration of kerosene with diesel fuel and much wasted resources. And when countries subsidize other products, or prevent producers from passing on prices to consumers, they can end up with many of the same problems as with fuel subsidies. Similarly, providing ongoing support to businesses can create dependencies and incentivize rent-seeking and corruption. While resorting to such measures cannot be endorsed as good practice, it is also true that more effective and efficient tools are often harder to implement and may require the development of new capacities. Policy-makers must assess the best tools at hand, given constraints on what is possible, stakeholder preferences and the relative strengths and weaknesses of the mitigation measures that are available.

TABLE 12 | CHECKLIST OF MITIGATION MEASURES COMMONLY USED TO ADDRESS FOSSIL-FUEL SUBSIDY REFORM

Mechanism	Associated impact
Fiscal	
• Redirect a proportion of subsidy savings into measures that can mitigate impacts	◗ Depends on focus on expenditure; see examples below
Macroeconomic	
• Gradual phase-out approach	◗ Dampens GDP shock and inflation
• "Big bang" reform approach	◗ High shock but reduces risk of anticipatory inflation
• Temporary reduction in fees and taxes on fuel	◗ Counteracts price increase, dampens inflation
• Reform during periods of low seasonal inflation	◗ Minimizes absolute level of inflation after reform
• Fuel price stabilization mechanisms	◗ Smoothens volatility
• Complementary monetary policy, including exchange rate and credit mechanisms	◗ Changes to the money supply can be used to manage inflationary impacts; changes to the cost of lending can also affect access to credit (see "Businesses and economic sectors," below).
Governance	
• Introduce or strengthen competition law	◗ Strong competition law ensures that market actors do not abuse a market-based pricing system (e.g., through cartel pricing). In the medium-to-long term, promoting competition drives down prices, counteracting price increases.
Businesses and economic sectors	
• Gradual phase-out	◗ Industries have time to adapt to new prices (e.g., improving efficiency; dampens shock for export-oriented sectors)
• Relax price controls in other sectors (e.g., food prices, transport prices)	◗ Eases impact on producers who cannot normally pass on price increases to consumers
• Short-term compensation for key sectors, for example: – Fuel subsidies (e.g., quotas, smart cards) – Non-fuel subsidies (e.g., reduced taxes, import tariffs, export awards)	◗ Helps cope with shock of price increase, giving businesses time to adapt, but avoids creating new long-term support measures
• Extend and increase access to credit by: – Extending credit facilities – Providing favourable loans, either in general or targeted specifically at energy efficiency – Developing micro-credit schemes to support small- and medium-sized enterprises	◗ Helps businesses spread shock of increased prices over a longer period and identify and pay for opportunities to improve energy efficiency; can include targeted assistance to different types of businesses (e.g., fuel-intensive industries, small-scale businesses, etc.)

TABLE 12 | CHECKLIST OF MITIGATION MEASURES COMMONLY USED TO ADDRESS FOSSIL-FUEL SUBSIDY REFORM (CONTINUED)

Households and social welfare	
Mechanism	Associated impact
• Increase budgets of agencies with purview over social assistance and energy access • Health assistance – Increase funding for health services – Construct/establish health facilities – Purchase and distribute supplies – Improve access (insurance or free health care) – New or expanded programs: maternal health, immunization	◗ Addresses social impacts using existing capacity, scales up existing mechanisms ◗ Reduces impacts on cost of living by lowering cost of health care and better addressing health needs; improves health-related welfare and therefore economic prospects in the medium-to-long term
• Education assistance – Increase funding for education – Construct/establish facilities – Purchase equipment – Improve access (capitation grants, abolish fees)	◗ Reduces impacts on cost of living by lowering cost of education and increasing access to education, improving economic prospects in medium-to-long term
• Infrastructure programs – Improve urban or rural infrastructure – Expand electrification – Invest in new electricity capacity – Build water purification centers – Improve water distribution – Build or improve roads – Expand public transport infrastructure	◗ Reduces impacts on cost of living by improving infrastructure, thereby: i) increasing access and reducing costs of other goods or services (electricity, water, transport); ii) investing in general economic prosperity, related to improved infrastructure; and iii) providing employment associated with the construction of infrastructure.
• Transfers – Increase non-taxable income – Introduce or increase minimum wage – Cash transfers (unconditional, conditional, for vulnerable groups) – Cross-subsidize other fuels – Subsidize non-fossil-fuel goods (electricity, food, water, transport) – In-kind transfers (food, water, etc.)	◗ Reduces impacts on cost of living by supplementing household incomes with cash (directly or indirectly) or other goods; or by lowering the costs of other goods
Environment	
Mechanism	**Associated impact**
• Investment in improved enforcement capability of existing regulations • Programs to promote sustainable fuel harvesting • Investments in clean energy – Clean energy technologies – Cleaner stoves	◗ Improves capacity to prevent environmental degradations ◗ Incentivizes sustainable biomass production ◗ Reduces or prevents negative impacts of fuel switching, reduces environmental impact of the energy sector

Source: based on a review of literature on reforms covering over 21 countries, including GSI (2012) and Aramide et al. (2012); Beaton & Lontoh (2010); Breisinger, Engelke & Ecker (2011); Burniaux et al., (2009); Clements, Jung & Gupta (2003); Coady et al., (2010); Coady & Newhouse (2006); El Said & Leigh (2006); Ellis (2010); del Granado, Coady, & Gillingham (2012); Hassanzadeh (2012); IMF (2008); IMF (2012); Kojima (2009); Laan (2011); Mendoza (forthcoming); OECD (2011); de Oliveira (2010); Solanko (2011); Soni, Chatterjee & Bandyopadhyay (2012); Suwala (2010); Yusuf et al. (2010)

KEY ISSUE: CASH TRANSFER MECHANISMS AS AN ALTERNATIVE TO SUBSIDIZATION

BOX 21

In recent years, much literature on energy subsidy reform has focused on cash transfer mechanisms as a key mitigation option. This is because, in many countries, broad-based fossil-fuel subsidies primarily exist in order to provide welfare assistance to low-income households. If this is the policy objective, cash transfers are a much more efficient tool to achieve this objective.

An efficiently run cash transfer system will target its support at only the consumers who need it, so it will not waste resources on higher income strata in society. Moreover, cash payments allow households to determine what sort of expenditure is most needed to promote their welfare. Rather than purchasing energy, households might choose to prioritize food, health or education as a more pressing need. Conditional cash transfers, such as Mexico's ***Oportunidades*** program, go further and make cash payments conditional on households meeting fixed criteria, such as a certain level of attendance at health care services or school. By promoting investments in an entire generation's physical and mental development, it is argued that countries can break the cycle of poverty (GSI-IISD and APEC, 2012).

Whether or not a cash transfer mechanism can be considered as a mitigation measure will depend upon existing capacity, time and resources, as well as the necessary level of cross-ministry cooperation. In order to target payments effectively, large amounts of data are needed on the welfare of individual households. Mechanisms are then needed for distribution, monitoring and adaptation. Depending on the country, there may be concerns about the governance of such programs—potentially creating as many opportunities as subsidies for corruption to divert resources. Some countries have opted to focus on alternative, existing mechanisms to increase household incomes at the same time as promoting developmental objectives. For example, Ghana, Jordan and Mozambique have used a range of alternative mechanisms such as increasing minimum wages, abolishing school fees, expanding health programs and investing in infrastructure projects to extend electrification (Coady et al., 2010; IMF, 2008).

However, the short-term development of cash transfer mechanisms can be successful.

- In 2005, Indonesia implemented the Bantuan Langsung Tunai (BLT), two unconditional cash payments of around US$30 over a six-month period to around 19.2 million households. Local community leaders identified poor households by a proxy-means testing of household survey data, and cash was distributed through local post-offices (Beaton & Lontoh, 2010).
- In 2010, Iran also created a cash transfer mechanism as part of a reform package. The system was broad-based, providing payments to all households choosing to register for the system, initially around 80 per cent of the population. Payments were distributed by electronic transfer to dedicated bank accounts (Guillaume, Zytek & Farzin, 2011).

In neither case did these cash transfer mechanisms represent the development of more sophisticated, targeted social safety net. In Indonesia, the BLT was short term, and was not formulated to provide a long-term exit strategy from poverty—or even energy subsidies (Beaton & Lontoh, 2010). Although Iran's cash transfer mechanism is ongoing, the lack of targeting has resulted in a policy that is still highly inefficient and costly, with payments being made to the majority of the population at a cost of 80 per cent of subsidy savings, with the remaining 20 per cent being spent on support to industries (Hassanzadeh, 2012).

In considering the use of cash transfers, one option may be to focus on existing social assistance mechanisms in the short term; while, in the medium term, developing a comprehensive, well-designed cash transfer system that is fully aligned with broader developmental objectives.

3.3.4 Projecting the Impact of Mitigation Measures

As with the initial price increases, it is important to assess the impact of mitigation options on the reform scenario: what magnitude of intervention is required to have the desired impact? What aspects of policy design are fundamental to its effective and efficient functioning?

It is usually fairly simple to build mitigation measures into quantitative approaches. Data on the effectiveness of existing, similar interventions are usually available in-country, through ministries with responsibility for competition, business and social welfare, and in international policy literature.

AN APPROACH IN PRACTICE: ASSESSING MITIGATION OPTIONS IN GHANA

BOX 22

As part of the IMF's PSIA in Ghana, three mitigation measures were considered: maintaining kerosene subsidies, a capitation education grant and a cash transfer program.

No complex statistical modelling was used. Instead, the analysis was conducted as an extension of the PSIA described in Box 18 on p. 52. Policy analysts had already used a PSIA to identify the extent to which subsidies would cause direct and indirect impacts on household expenditures. They then estimated how various mitigation options could be used to decrease household expenditures in other areas.

The first mitigation option that was considered was not including kerosene in fuel subsidy reforms. The impact of this could be easily projected by conducting a PSIA assuming the reform of all fossil-fuel subsidies with the exception of kerosene. The second two mitigation options that were considered were to expand an existing per capita education grant or to establish a cash transfer mechanism. It was necessary to identify some information on the performance of the existing education grant and the utilization patterns of social services, and then it could be calculated how these interventions, too, would reduce household expenditure. In order to allow for an easy comparison of the different mitigation options, it was decided to model impacts assuming that the money spent on per capita education grants and cash transfers would be equal to the same amount of money as maintaining kerosene subsidies: 3.6 per cent of total subsidy spending.

Feeding these data and assumptions into the PSIA analysis, the study estimated that:

- Maintaining kerosene subsidies would reduce the net income effect from 9.1 per cent to 7 per cent
- Capitation education grants from 9.1 per cent to 7.1 per cent
- A proxy-means tested cash transfer from 9.1 per cent to 4.4 per cent

It was estimated that, using only 5.4 per cent of total subsidy savings, a well-run cash transfer program could entirely negate the effect of price increases on the poorest quintile.

The study also compared the extent to which different mitigation measures can target benefits to the lowest population quintiles. This showed the highest performance among proxy means targeted transfers, rural electrification and increased urban transport, with per capita education grants following up second, and kerosene subsidies and health programs managing to concentrate the least benefits on the bottom quintile.

Source: Coady & Newhouse (2006)

3.4 What Role for Monitoring and Adjustment?

Following implementation, ongoing monitoring and adjustment is an important part of any reform program. The actual impacts of subsidy removal may not work out as anticipated; or the policies that have been drawn up to mitigate impacts may not be operating effectively and efficiently. External factors can also play a role. International energy prices may change dramatically, reducing or increasing planned subsidy expenditure.

Monitoring the impacts of reform can also be used to showcase the benefits that a country has achieved as a way to promote future price increases. For example, rapid assessments in Indonesia in 2005 were able to show broad success in the cash transfer mechanism that had been drawn up, including satisfaction among transfer recipients. Assessments were also able to point to concrete achievements from other programs that formed part of the package—the government's Rural Infrastructure Project had resulted in the repair and development of around 4,000 kilometres of road, 351 bridges, 23 boat stands, 365 irrigation systems, a 128-kilometer irrigation channel, 179 water hydrants, 512 drinking water reservoirs, 550 shallow wells and 342 communal sanitation facilities, with most of the work being conducted by local communities themselves (Asian Development Bank, 2009). In the same vein, if there are a number of problems that have been experienced with past reforms, it may be useful to publicly track key parameters ahead of time. This can help build confidence that key concerns are being adequately addressed in the transition to market-based pricing.

BOX 23

GOING PUBLIC: COMMUNICATIONS AND AWARENESS-RAISING

It is generally considered good practice to publish assessments of how subsidy reform will affect the economy. The advantage of doing so is that it can help stakeholders think through the impacts of reform and begin a dialogue around addressing their concerns. It may also help identify issues that formal assessments have missed. And where analysis can report compelling evidence that planned mitigation measures will offset negative impacts, this can be used to help build support for reform. Similarly, it is important to ensure that there is general awareness and understanding of how negative impacts will be managed—in other words, to ensure that key stakeholders know how they will be supported. Otherwise, government plans are likely to face much higher political opposition.

In some situations where reform is particularly politically sensitive, policy-makers may need to weigh the costs and benefits of raising public awareness. The risks are that a public discussion that highlights negative impacts may be used to entrench anti-reform attitudes and mobilize vested interests that do not reflect the public good.

These issues should be carefully considered as part of a government's consultations and communications strategy around removing fossil-fuel subsidies (see Chapter 4, Building Support for Reform).

3.5 Summary: "Do's", "Don'ts" and Key Tools for Managing Impacts

✓DO's

- ✓ **Do attempt to project how reform will affect the macroeconomy and the households and businesses within it.** Fossil-fuel subsidy reform is fully capable of promoting sustainable development, but unless the full suite of impacts is considered, and the necessary mitigation policies are put in place, it is possible that effects may lead to regressive outcomes in some areas.
- ✓ **Do conduct as comprehensive an analysis as possible.** This includes disaggregating likely social, economic and environmental effects; identifying direct, indirect and induced impacts; and taking into account issues that are hard to analyze, such as impacts on the informal sector and energy access. Where possible, the GSI recommends using a mixture of quantitative and qualitative assessment methods, including simple static analysis of direct impacts and a full dynamic macroeconomic analysis that estimates feedback throughout an economy, disaggregating results appropriately. Although the "ideal" suite of analyses may not be possible, policy-makers can at a minimum still identify useful data through a mixture of qualitative research and simple statistical models.
- ✓ **Do consult and communicate about managing impacts.** Stakeholders hold important information and have preferences about how they are treated. This should be drawn on as far as possible in designing reform plans. Consultation and communication can also be used to raise awareness, build the credibility of reform plans and highlight success stories.

⊗DON'Ts

- ⊗ **Where possible, don't just focus on a one-off increase in prices.** In many countries, subsidies are a structural feature of the economy, and it will be necessary to develop alternative economic and social assistance measures in order to do away with subsidization for good. Many of these changes may be needed primarily during the adjustment period, but some of the supports for vulnerable groups may need to be permanent. A gradual approach may be necessary to free up the time and the resources required for investments in administrative capacity.
- ⊗ **Don't forget to assess the potential complications of mitigation measures.** In some cases, policies used to mitigate the impacts of reform can be just as expensive and poorly targeted as subsidies. Indeed, countries often provide subsidies in other areas, which can have unintended impacts of their own. Subsidy reform should represent a shift to more effective and efficient government interventions, and the design of mitigation measures is not an exception.

TABLE 13 | SUMMARY TABLE: KEY ACTIVITIES AND TOOLS

Activities	Tools	Page
Assessing qualitative impacts	• Checklists • Review of literature • Review of data on past reforms • Conceptual maps (systems thinking) • Identifying groups most reliant on fossil fuels • Stakeholder consultations	44
Comparing national assessment with international experience	• Checklist of impacts commonly associated with fossil-fuel subsidy reforms, assuming no mitigation measures have been introduced	46
Assessing quantitative impacts	• Simple analysis based on economic databases - Income and expenditure surveys - I-O tables - SAMs • CGE models • Energy sector models	51
Deciding when and how to manage impacts	• Checklist of factors to take into account in identifying which impacts require mitigation • Three categories of mitigation measure: - How subsidies are changed - Responses to impacts: economic and social assistance - Efforts to counteract price increases	54-55
Drawing on international experience in choosing and designing mitigation measures	• Checklist of mitigation measures that countries have introduced to manage the impacts of fossil-fuel subsidy reform	58-59

CHAPTER 4
BUILDING SUPPORT FOR REFORM

This chapter discusses the routes that governments can take to build support for fossil-fuel subsidy reform: namely, through internal organization, consultation with stakeholders, and communications about problem of subsidies and intentions for reform.

It answers the following questions:

- How can I identify key stakeholders and audiences, internal and external?
- What strategies are available to map out supporters and opponents of reform?
- What mechanisms are available to manage internal and external consultations?
- What sort of objectives for communications strategies—what changes in awareness, attitudes or behaviour—should I aim for?
- What messages should be used in communications?
- What channels of communication can be used?
- What role is there for monitoring and adjustment?

It concludes with a list of "do's" and "don'ts" for policy-makers conducting consultations and communications, as well as a summary of key tools that can be used in each activity.

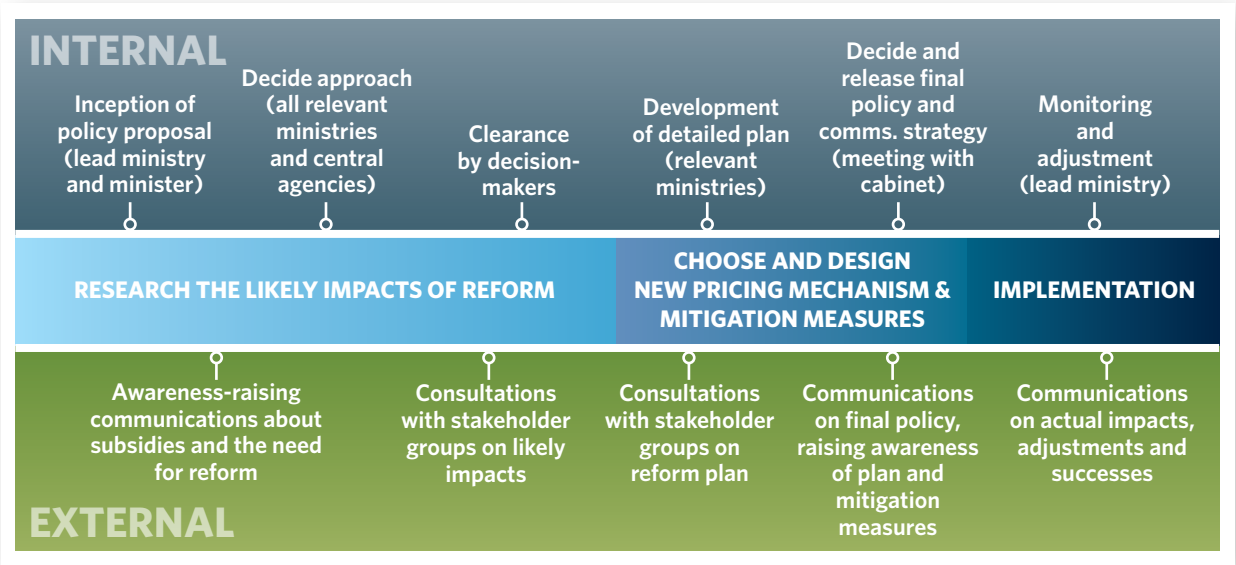
Increasing consumer prices for fossil fuels can be politically disastrous. But around the world, including Southeast Asia, a number of countries have done so without major political disruption. What, then, makes the difference between success and failure? In exceptional circumstances, a crisis can galvanize action, as decision-makers and the public are more open to change that it is driven by extreme circumstances or broader restructuring (OECD, 2010a). But crises are not desirable and experience shows that governments can also use a number of tools to create a political space in which reform is possible.

Many of the ways that governments can build support are centred on how they choose to reform fossil-fuel subsidies. This includes the pace of reform—gradual or "big bang," as described in Chapter 2, Getting the Prices Right, pp. 27-28,—and the packages that are used to support negatively affected groups—mitigation measures, as described in Chapter 3, Managing Impacts, pp. 54-59. But without a broader strategy that takes into account a range of stakeholder ideas, concerns, perceptions and preferences, planning may not be based on full information or may simply fail to generate widespread acceptance.

Plans are most likely to prove effective if there is a broader strategy to build support that includes **internal coordination**, to ensure a whole-of-government approach between different ministries and agencies; **consultations**, to take into account the information, concerns and perceptions of different stakeholders; and **communications**, to build shared understanding, foster dialogue and explain the rationale for reform and how the government will minimize negative impacts. The exact nature of these components will differ depending on the subsidies in question. For example, a plan dealing with electricity sector reform, particularly if the sector is dominated by state-owned enterprises, can involve quite different political economy challenges than the reform of petroleum subsidies—hence requiring different coordination, stakeholder assessments, mitigation measures and communication strategies.

Internal coordination, consultation and communication should be integrated through the planning, development and implementation of strategies for fossil-fuel subsidy reform. Figure 9 illustrates when consultation and communication typically occur in the policy process. Initially, the focus is on internal consultation as the government aims to create a coalition for reform among politicians and the government's civil and administrative services. A first stage of communications may also take place toward the beginning of the process, raising awareness about the problems of fossil-fuel subsidies and the need for change. Later in the cycle, the external strategy shifts to focus on gathering information from the public and stakeholders, including in response to draft reform strategies; while internal processes focus on ensuring a consistent interface with external stakeholders and deciding final policies. Finally, communications are needed before and after price increases, both to raise awareness about how subsidies will be reformed and to show that the government is monitoring impacts and responding to concerns.

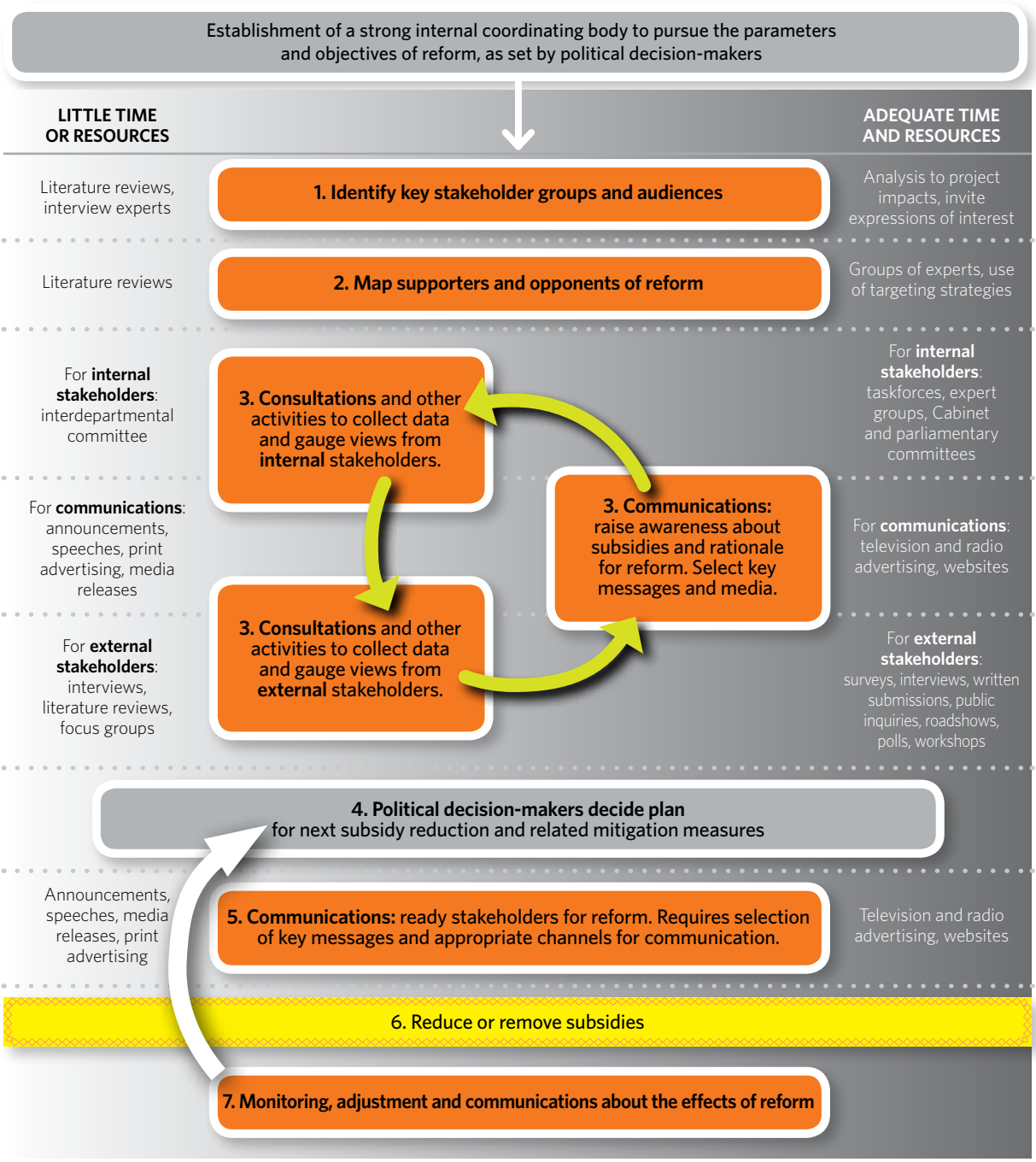
FIGURE 9 | MODEL POLICY CYCLE SHOWING STRATEGIC POINTS FOR INTERNAL AND EXTERNAL SUPPORT BUILDING



A consultation and communications strategy provides the means of identifying involved parties' underlying interests, engaging them in decision-making and promoting their understanding of and support for proposed reforms (Cabañero-Verzosa & Garcia, 2009; Institute for Public Diplomacy and Global Communication, 2009). It can improve effectiveness (through better programs), responsiveness (knowing citizens' needs and responding to them) and accountability (by explaining policies and providing accountability mechanisms). Transparent and participatory processes also build trust in decision-making and contribute to government legitimacy. Reforms that are evidently founded on the needs and priorities of citizens are more likely to be accepted and retained. An IMF review of 40 country experiences between 2002 and 2006 revealed that the likelihood of success in subsidy reform almost tripled with strong political support and proactive public communications (IMF, 2011).

This chapter sets out guidance on the general process that is needed to design and implement an integrated strategy to build support for fossil-fuel subsidy reform. Figure 10 provides a visual representation of the main elements of the strategy and available tools. For each stage in the process, tools are suggested, as appropriate given varying time and resources.

FIGURE 10 | KEY STEPS AND TOOLS FOR THE DEVELOPMENT AND IMPLEMENTATION OF A CONSULTATION AND COMMUNICATION STRATEGY TO SUPPORT FOSSIL-FUEL SUBSIDY REFORM



4.1 How Can I Identify Key Stakeholders and Audiences?

If the objective of a political strategy is to build support and reduce opposition for proposed reforms, then it follows that the key stakeholders must be identified and their perceptions of the proposed reforms assessed. Stakeholders can be internal and external.

4.1.1 Internal

Internal stakeholders are those ministers and agencies within the government structure (including relevant government-owned enterprises) that will be responsible for developing and implementing reform. In addition, stakeholders will include ministers and agencies whose constituencies have a significant stake in reform, such as when subsidies are provided for industries like agriculture or fishing.

Fossil-fuel subsidy reform will often have implications for a wide range of internal stakeholders. This means that **it is important to establish strong internal coordination among the different government actors involved to ensure a whole-of-government approach.** By default, governments may take a "big-tent" approach to coordinate on such complex issues—bringing together all possible stakeholders and trying to establish a common position and allocate responsibilities. It may also be worth considering if internal stakeholders should be gathered more slowly, beginning with the most important stakeholders that are needed to make reform happen. The political weight of the fiscal side of the government, for example, can help to build credibility and involve top political figures in the process, allowing for a more effective expansion outward to other stakeholders.

A list of ministries and government bodies that often have a stake in fossil-fuel subsidy reform is provided in Table 14. Political leaders are arguably the most important stakeholders. They decide whether to undertake reform, how it should occur and when. If non-government organizations take responsibility for implementing reforms, such as petroleum retailers or banks responsible for delivering cash transfers, then they may also be included in this group.

TABLE 14 | DECISION-MAKERS AND MINISTRIES THAT TYPICALLY HAVE A STAKE IN FOSSIL-FUEL SUBSIDY REFORM

Issue	Political	Bureaucratic	Other
Whole-of-government coordination	President or prime minister, cabinet, state council	President or PM's department, central planning agencies	
Energy policy	Minister for energy	Department for energy and resources	State-owned energy companies
Economic policy	Finance minister or treasurer	Department of finance or treasury	
Social policy	Minister for social protection	Department of social services	Domestic non-government organizations involved in social service delivery
Business policy	Minister of commerce or business	Department of commerce	Financial or regional institutions involved in delivering financial assistance (loans, cash payments)
Environmental policy	Minister of environment	Department of environment and natural resources	

The responsibility of policy-making rarely rests solely with the parts of the federal administration that are under the direct authority of the executive branch of government. Depending on a country's system of government, it may also be necessary to consider the stake held by parliamentarians and subnational jurisdictions. These actors are illustrated in Table 15.

Where it exists, federal parliament is a key stakeholder as it often holds final power over whether reforms will be implemented. Non-government parliamentary members usually have little political advantage to gain from supporting reform: they are subject to the same electoral forces as government members but without the same level of responsibility for fiscal management. The ideal situation is for political decision-makers to establish cross-party agreements on fossil-fuel subsidy reform, making linkages and concessions to elements of opposition party programs. Subnational governments can have power over issues relevant to reform such as taxation, regulation and service delivery (health, education, infrastructure and social payments). Subnational jurisdictions can also be responsible for police, which may need to be informed and resourced to respond to unrest. Local governments can be important stakeholders for disseminating information about policy changes (such as holding community meetings) and implementing policy changes (disseminating compensation and the design and delivery of infrastructure projects).

TABLE 15 | NON-EXECUTIVE BRANCHES OF GOVERNMENT WITH A STAKE IN FOSSIL-FUEL SUBSIDY REFORM

Stakeholder group	Subcategories	Represented by
Federal parliament (non-government members)	Upper and lower houses	Parliamentary and Senate committees
State, provincial and territory governments	First minister, key portfolio ministers and their departments	Federal-state consultative bodies and leaders' meetings
Local government	Leaders and their offices	Local government associations

4.1.2 External

The most obvious stakeholders in subsidy reform are those who win and lose from the subsidy, those who are paying and the organizations that represent them—and often that means, in principle, everyone. The poor and most vulnerable, for example, may get little direct financial benefit, but they have a strong stake in a policy that channels away funds that could be used for health, education and other pro-poor investments. The significance of fossil-fuel subsidy reform to a stakeholder group can differ by energy type. It may therefore be necessary to map specific stakeholders by fuel type, if subsidies on several fuels are being reformed. Examples of external stakeholder groupings are outlined in Table 16.

TABLE 16 | GENERIC LIST OF EXTERNAL STAKEHOLDER GROUPINGS

Stakeholder group	Subcategories	Represented by
Public consumers	Lower, middle and upper income groups	Civil society, consumer organizations
Non-consuming public	Low income groups that do not use subsidized fuel but would be eligible for cash assistance	Civil society
Fuel industry	Exploration companies, producers, importers, exporters, refiners, distributors, retailers	Industry associations, chambers of commerce, lobbyists, peak bodies
Industry consumers	Primary production and processing, transport, manufacturing, services, construction, ICT	Industry associations, chambers of commerce, lobbyists, peak bodies
Workers	Production and consuming industries	Unions
Policy community	Academia, policy institutes and commentators	Coalitions, councils, peak bodies

4. 2 What Strategies are Available to Map Out Supporters and Opponents of Reform?

Three aspects of fossil-fuel subsidy reform will affect the position held by stakeholder groups:

1. How much stakeholders benefit from the status quo.
2. How stakeholders will be affected when subsidies are taken away.
3. How stakeholders will be affected when mitigation measures are implemented.

But opinions are not only, or necessarily even mainly, influenced by the facts of subsidies and subsidy reform. Stakeholders also have perceptions and concerns that are shaped by ideology, what is fair with regard to senses of entitlement and equity, comparisons with neighbouring countries, media messages, political communications and propaganda. Influential and vocal opinion-formers may include the media, industry associations, politicians, policy institutes, civil society organizations and academia.

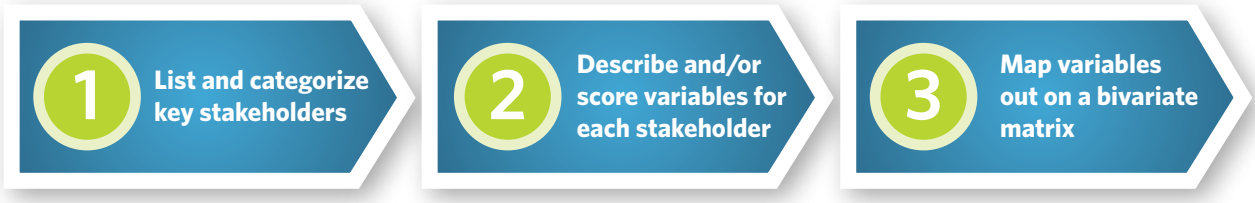
How subsidy reform will affect stakeholder groups can be identified through qualitative and quantitative projections of the impacts of reform. All of the methods for projecting impacts that are described in Chapter 3, Managing Impacts, pp. 43-53 will be relevant in this context. PSIAs, for example, can provide information on the groups that benefit from an existing fossil-fuel subsidy and how they will be affected by subsidy removal. This chapter focuses on supplementary tools, such as polls, surveys and focus groups, that can provide direct information about attitudes and perceptions.

In best practice, an assessment of stakeholder views should include a means of allowing any citizen to nominate an interest in plans for reform. For example, one method would be to advertise that a review of fuel subsidies is taking place and to request expressions of interest. This reduces the risk that certain stakeholder groups will be inadvertently overlooked by government officials, though may still risk excluding those who are less well-informed, have poor literacy or are generally fragmented and unorganized. If this is a concern, additional efforts can be made to reach out to groups that are likely to be underrepresented. Time and resources are often limited. At a minimum, interviews with experts and a review of existing literature can provide an initial list of key stakeholders and their main concerns.

4.2.1 Stakeholder Mapping

The World Bank provides a suite of practical tools for analyzing the country context for policy reform, including stakeholder mapping (Holland, 2007). The tools provide a step-by-step guide to analyzing the dynamic between individual stakeholders and the proposed reform. The method is based on information derived from existing literature and additional brainstorming sessions or focus groups with knowledgeable key informants. The essential steps, which can be performed by small groups in a workshop situation, are to list and categorize key stakeholders, and then to score stakeholders according to a selected set of variables.

FIGURE 11 | STEPS FOR STAKEHOLDER MAPPING



Source: Holland (2007)

Variables might include:

- **Interest:** the perceived level of interest in the policy reform, along a continuum from complete opposition to complete support.
- **Impact:** the degree to which the policy reform will affect each stakeholder.
- **Power:** the level of coercive power the stakeholder has to command compliance in the policy process.
- **Resources:** the level of resources that stakeholders possess and are able to bring to bear.
- **Legitimacy:** the degree of legitimacy of each stakeholder's interest, meaning the extent to which the stakeholder's claims are seen as appropriate by other stakeholders.
- **Urgency:** the urgency that should be attached to competing claims.

Based on the information derived from the variable analysis, each stakeholder can be plotted on a matrix of influence and importance that will show their relationship to the policy process (see an example in Box 24). One set of key stakeholders will be poor or vulnerable groups that need support in order to minimize the negative impacts of reform, but who may not have the influence to make these needs heard. They are likely to be placed into quadrant A of the matrix. Another set of key stakeholders will be those that are powerful enough to block reform, likely to be placed in quadrants B or D.

BOX 24

USE OF "IMPORTANCE/INFLUENCE" MATRICES TO MAP OUT STAKEHOLDERS

An importance/influence matrix is a graphical way to represent stakeholders in a two-dimensional plane according to their importance and their influence, as illustrated in Figure 12.

FIGURE 12 | EXAMPLE OF AN IMPORTANCE/INFLUENCE MATRIX

- Box A shows stakeholders of high importance but with low influence. They require particular attention in policy design and implementation to ensure that their participation is ensured and their interests are protected.
- Box B shows stakeholders of high importance to the policy intervention who can also significantly influence its impact. Where possible, policy-makers should develop good working relationships with these stakeholders to build support for the reform.
- Box C shows stakeholders who are of low priority and low influence. Although they might need some limited involvement and monitoring, they are unlikely to be the focus of the reform process.
- Box D shows stakeholders with high influence, who can affect the outcome of reform, but whose interests are not the target of the intervention. These stakeholders might be able to block, undermine or skew policy design or implementation and therefore could constitute a "killer risk."

Source: Holland (2007)

4.2.2 Taking into Account Political Factors

Governments tend to be supported by factions that comprise their key constituencies. These can include influential groups such as farmers, the urban working class, business leaders and associations, unions, the transport sector and the middle classes. Together these can be termed the ruling coalition (Gutner, 1999).

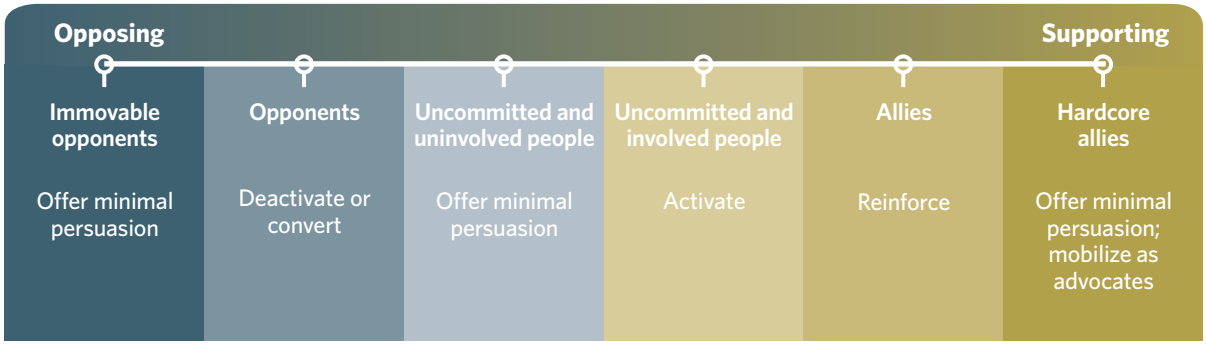
The political strength of the middle class, in particular, will determine whether this group is able to block reform or demand compensation. An indication of political organization in this group is the extent to which previous economic restructuring has been met by industrial action by teachers, university students, the public sector and affiliated unions (Gutner, 1999). Within the government, ministers have differing levels of influence. Ministers representing the ruling coalition will have a prominent voice in discussions related to subsidy reform. The finance minister is usually a senior figure and will have sway within the party. He or she will be a valuable ally in fuel subsidy reform, given its economic merits. Groups outside the ruling coalition will have varying political influence depending on their cohesiveness, degree of organization, access to media and relationship with the government of the day.

Analysis of these groups is the purview of political representatives and their advisors. Policy-makers can keep political factors in mind when developing reform strategies, but they are generally required to stay neutral on party-political issues and cannot draw up reform plans that favour one constituency over another. Fossil-fuel subsidy reform, however, is usually so controversial that it cannot ignore politics. This means that plans may require strong involvement from political leaders. Bureaucrats can respond to this challenge by developing a range of options for consideration by decision-makers, with clear recommendations about the best options from a politically neutral perspective. Politicians may then use their prerogative to choose an alternative option. As illustrated in Box 25, opposite, there are a number of strategies for facing off or compensating political opponents and many countries have taken account of political factors when designing mitigation. While such decisions can be taken in forms that are perverse—either because of their cost or their impacts on the economy, households and governance—they can also, when judicious, make reform politically possible, and in some cases more effective.

4.2.3 Targeting

Political theory suggests that efforts to influence opinion should focus on "swing constituencies" because these groups can potentially be persuaded about the benefits of reform (Cabañero-Verzosa & Garcia, 2009). Those who are deeply opposed to reform for ideological reasons are unlikely to be moved in their opinion. Strong allies will not need persuasion because their support is secure. However, members of this group could be mobilized as advocates for reform. A similar targeting process applies to politicians. Before the reform plan goes to parliament for consideration, lead ministers are likely to negotiate with non-government members that fall within the "uncommitted" part of the spectrum to secure support for the plan. Figure 13 provides an indication of how resources can be targeted across this continuum.

FIGURE 13 | TARGETING STRATEGIES



Source: Adapted from Gary Orren, Kennedy School of Government, Harvard University, Cambridge, MA, 2002 in (Cabañero-Verzosa & Garcia, 2009)

FACING OFF AND COMPENSATING POLITICAL OPPONENTS OF REFORM

BOX 25

Cox (2007) describes four types of strategy that governments can use to reform subsidies. These vary along two dimensions: the pace of reform (gradual or "big bang") and whether or not compensation is provided, as illustrated in Table 17. If governments provide no compensation and pursue gradual reform, Cox calls this a "squeeze-out"—slow but steady removal. No compensation combined with fast reform is a "cut out"—sudden exclusion from benefits. When compensation is provided, and across a gradual time frame, it is a "cash-out"; and if paid once as part of a "big bang," it is a "buy-out."

TABLE 17 | ALTERNATIVE STRATEGIES FOR SUBSIDY REFORM

		Pace of reform	
		Gradual	"Big bang"
Compensation provided?	No	Squeeze-out	Cut-out
	Yes	Cash-out	Buy-out

Source: Adapted from Cox (2007)

Applying this framework in practice can be complicated. The poor and vulnerable usually require support via some kind of mitigation measure. Otherwise, reform can have damaging social impacts. But not everyone needs to receive assistance. Wealthy households and businesses can usually absorb losses and adapt their behaviour to higher prices. Other stakeholders might be between the two, able to make a case for more or less support, based on need—and to make a case for compensation, based on political weight. In these cases, the framework can be a useful tool to think about how to treat specific stakeholder groups. Even groups that do not merit any assistance based on economic and social impacts might still warrant temporary or one-off compensation to stop them blocking reforms politically. As is illustrated in the examples below, mitigation measures can be targeted for purely social reasons, or for political and administrative ones.

Indonesia's cash transfers to the poor and "near poor"

In 2005 Indonesia used a cash transfer scheme to cushion fuel price increases, targeted at households that were either below the poverty line, "near-poor" or working class with an income around minimum wage. The first register of eligible households included about 28 per cent of the total population. The decision to provide payments beyond the poorest was made because of fear that reform might throw the "near-poor" into poverty (Beaton & Lontoh, 2010). Following the first payment, a verification process concluded that 8 per cent of recipients had been wrongly identified and 22 per cent of poor or near-poor households had been wrongly excluded (ASEAN, 2010). Total recipients for subsequent payments comprised around 35 per cent of the total population (Beaton & Lontoh, 2010). Indonesia made a trade-off: a more costly scheme in return for reaching a larger proportion of the targeted population.

Iran's open eligibility to cash transfers

In 2010 Iran raised domestic energy and food prices by up to 20 times. Among other programs, cash transfers were used to ease the transition. Initially, the government considered targeting only the poor. However, denying compensation to wealthier households could have led to discontent. For this reason, and for administrative simplicity, the government let all citizens apply for compensation, though wealthy households were discouraged. Over 70 million individuals (93 per cent of the total population) registered. When reforms were implemented, there was muted opposition; but this political success came at a price. Following additional international sanctions against Iran related to its nuclear weapons program, the government continued to provide cash transfers. The cost of compensation soared and prevented the use of subsidy savings in other areas. In turn, this contributed to inflation, leading to considerable discontent with the government and its reforms (Guillaume, Zytek & Farzin, 2011; Hassanzadeh, 2012).

4.3 What Mechanisms are Available to Manage Internal and External Consultations?

Consultation is the gathering of information by government on stakeholder views, within or outside government. Unlike communications, it implies a two-way flow of information, and can also include negotiations with stakeholders, or at least the potential for negotiations to take place. In its own right, consultation is an important tool for identifying information about how best to implement fossil-fuel subsidy reform. It can also be used to build support among stakeholders by raising awareness, responding to their concerns and, depending on the extent of negotiation, giving them ownership over reform plans.

4.3.1 Internal

Fossil-fuel subsidy reform often warrants the establishment of a dedicated government body to oversee planning and implementation, given the need for high-level leadership and coordination among multiple agencies. The aim of this body is to be a coalition within government that can take policy leadership and navigate the political environment. An analysis of major reforms in OECD countries found that strong leadership and government cohesion were essential elements of success (OECD, 2010a). Table 18 summarizes options for internal consultation bodies applicable to fossil-fuel subsidy reform. Of these, a taskforce reporting to the first minister would be the strongest arrangement. It would provide a dedicated team of officials from relevant departments to develop a whole-of-government approach. By reporting to the first minister, it would have greater power and not be beholden to any one constituency.

TABLE 18 | ANALYSIS OF ALTERNATIVE ADMINISTRATIVE BODIES FOR INTRA-GOVERNMENT CONSULTATION

Mechanism	Key features	Strengths	Weaknesses
Cabinet sub-committee	• Involves all key ministers • May be led by head of government	• Ensures political-level participation • Decisions unlikely to need higher level of approval	• Needs to be supported by consultation and advisory support at the bureaucratic level
Parliamentary committee	• Key ministers mobilize coalitions or champions within parliament	• Can involve non-government members of parliament • Identify and address concerns of parliament members that could block passage of necessary legislation	• Usually only relevant once reform proposal near-final
Taskforce	• Seconds officers from relevant departments and agencies • Limited lifespan to develop and implement reform • May be hosted by a central agency	• Dedicated resources from all relevant agencies • Provides central point for relations with internal and external stakeholders	• Time consuming and resource intensive • Conflict can arise between taskforce and home departments
Inter-departmental committee	• All relevant agencies represented • Meet regularly or ad hoc	• Involves all relevant agencies without removing resources from home agencies	• May achieve little beyond awareness-raising among officials • Must feed into process for decision-making
Expert group	• Experts could be within or outside government but must have backing of lead ministers	• Creates some distance between political leaders and reform plans	• Leaders may not take advice if it comes from non-government experts

Internal consultation can also take place via national political processes. In many countries, a decision to change the pricing of fossil fuels does not rest with the executive branch of government alone, and must be weighed and debated by the other bodies with responsibility for the country's governance. While such internal processes are often a point of "decision-making," extensive consultation must usually take place to prepare the ground, adequately informing political leaders and ensuring that a prepared set of reform options are politically viable (see Box 26).

THE INDONESIAN GOVERNMENT'S CONSULTATION WITH PARLIAMENT

BOX 26

The Indonesian Parliament, also known as the DPR, plays an important role in the formulation of fuel subsidy policy. The DPR has three central functions: legislative, budgeting and oversight. The DPR's primary influence over fuel subsidy policies lies in the state budget (Anggaran Pendapatan dan Belanja Negara [APBN]). The APBN, which sets out the government's annual financial planning, requires approval from the DPR. The APBN covers a period of one year, from January 1 until December 31.

In 2005, the Indonesian government presented two options to the parliament: (i) keep fuel prices constant at the expense of subsidy costs expanding to almost US$12 billion, a 92 per cent increase from the previous year or (ii) increase fuel prices, which would lower the subsidy cost to US$9 billion. The government attached a compensation package with the second option.

Understanding that the compensation package could reduce political risk, the parliament unanimously chose the second option.

Source: GSI-IISD and APEC (2012); Braithwaite et al. (2012)

4.3.2 External

Assessing the views of external stakeholders is useful for a number of reasons. It provides information about how they will be affected by fossil-fuel subsidy reform. It also assesses stakeholder perceptions of reform plans and the government's ability to carry out the changes. This may identify reasonable criticisms, as well as misconceptions about how reform will take place—with implications for the nature and targeting of complementary policies discussed in Chapter 3, Managing Impacts, and the development of communications strategies. Consultation can also be used to give stakeholders influence over options for policy change, identifying preferred methods for removing subsidies and managing impacts. This can help make plans practically and politically acceptable.

A range of consultative tools is outlined in Table 19, overleaf. The extent that external consultation can be conducted will depend on the time and the financial resources that are available, well as the political sensitivity of reform and the extent to which consultation is habitually conducted around major policy issues. Ideally, where fossil-fuel subsidy reform represents a major economic change, then consultation will involve methods that engage with stakeholders directly, establishing two-way communications using methods such as public inquiries, discussions groups, workshops and roadshows. Where this isn't possible, at a minimum, stakeholder views can be gauged by systematically reviewing literature and media reports and talking with energy experts and stakeholder representatives.

TABLE 19 | STAKEHOLDER CONSULTATION MECHANISMS RELEVANT TO FUEL SUBSIDY REFORM

Mechanism	Key features	Strengths	Weaknesses
Review literature and media reports	• Use existing written sources to gather information on stakeholder views	• A rapid assessment method • Few resources required	• Unlikely to be comprehensive • May misrepresent stakeholder views
Interviews	• Contract experts and stakeholder representatives to gather information on the views of stakeholder groups	• A rapid assessment method • Few resources required	• Unlikely to be comprehensive • May misrepresent stakeholder views
Polls	• Pose a small number of closed questions (yes or no answers) • Typically conducted through interviews, though simple polls can be conducted by SMS	• Provides a snapshot of public opinion at one moment in time • Can provide clear evidence of public opinion on very specific policy questions	• Data quality depends on sample being representative of targeted stakeholders • Does not provide information on the reasons underlying opinions • Does not contribute to two-way communication
Survey research	• Pose a standard set of open and/or closed questions • Conducted with face-to-face or telephone interviews, self-completion forms, or electronically via the Internet or e-mail	• Can be used to gain feedback from large and diverse groups • Can often be conducted relatively cheaply • Enables comparisons between stakeholders or different stages of the reform process • Can provide a lot of qualitative and quantitative data	• Data quality depends on sample being representative of targeted stakeholders • Data quality depends on questions being clear, impartial and unambiguous, with questions ideally being trialled before distribution
Web-based	• Utilizes online chats, discussion boards and list serves, surveys, Internet-based forums and questionnaires	• Cost efficient • Can reach a wide audience quickly • People can participate at a time and on a date that suits them • May appeal to people who do not want to participate in group gatherings	• Participation is limited to those with Internet access • Results can be skewed if some respondents answer survey multiple times • Resources required to collate data in a form suitable for analysis
Discussion groups, focus groups and workshops	• Explore a limited number of issues over a brief period of time • Discussion groups involve open dialogue • Workshops generally more structured	• Targets specific groups • Can be structured in a number of ways to achieve a range of outcomes • Harnesses stakeholder energy and knowledge to generate innovative options • Can build capacity, consensus, ownership and relationships • Can be iterative, building over the course of the policy process	• Data quality depends on group being representative of targeted stakeholders • Produces qualitative, not quantitative, information, which may not be easily understood or evaluated

Mechanism	Key features	Strengths	Weaknesses
Roadshows	• Travelling presentation and/or display used to seek feedback about, or input into, a project that potentially affects more than one community	• Inclusive of a number of geographic communities • Ensures consistent information is provided to different communities • Can coincide with local events • Presentation of verbal and visual information provides access to a wide range of people	• Resource-intensive to establish, move and staff • Outcomes can be difficult to interpret across different communities
Public inquiries	• Processes vary but generally involve calling for submissions of interest, holding meetings to discuss issues and concerns, inviting written submissions and issuing draft recommendations for comment	• Any interested party can become involved	• Time- and resource-intensive • Favours more well-informed and articulate groups as participants

Source: Adapted and expanded from Queensland Government (2010).

BOX 27

EXAMPLES: CONSULTATIONS IN IRAN AND MALAYSIA

The Iranian government undertook an extensive consultation campaign with the corporate sector to gauge their views on removing subsidies. In addition, a systematic analysis of over 12,000 enterprises assessed how reform could impact industry.

Of these businesses, 7,000 were selected to receive direct financial assistance or rations of fuel at discounted prices for a limited time. While the diesel price was raised from IRR165 per litre to IRR3,500 per litre, selected sectors, such as agriculture, fisheries and transport were offered some diesel at IRR1,500 per litre (Guillaume, Zytek & Farzin, 2011).[5]

To help develop a roadmap for rationalizing subsidies, **the Malaysian government's** Performance Management & Delivery Unit (PEMANDU) used a planning mechanism known as a "policy lab," where experts are brought together to develop solutions to difficult policy problems. The Subsidy Rationalization Lab, held in 2010, invited 70 experts from a range of fields, who worked for six weeks in consultation with cabinet members to develop a detailed subsidy reform plan (GSI, 2013). During this process, the government undertook a number of additional initiatives to engage a broader set of stakeholders. This included a nationwide mobile phone texting poll, which assessed public attitudes to subsidy reform and a public forum including members of parliament, leading academics, business leaders and representatives of consumer groups (GSI, 2013). The poll found that 61 per cent of the 191,592 respondents agreed to the subsidy rationalization initiative, with the majority preferring for it to be phased out over three to five years (Jala, 2010). Key stakeholders were also invited to take part in an Open Day on subsidy rationalization, where recommendations from the lab were publicly displayed. PEMANDU took feedback into account in developing a final recommendation to the prime minister (Hock, 2010).

[5]While Iran's consultation process was exemplary, the policy was not implemented as planned. Originally, 30 per cent of the anticipated savings from subsidy reform were to be allocated to industry compensation programs. However the government spent a larger proportion of the savings on cash transfers to the public, leaving only 20 per cent for the industrial sector (Hassanzadeh, 2012).

4.4 How Do I Identify Objectives for Communications—What Changes in Awareness, Attitudes or Behaviour Do I Aim For?

A government communications strategy is a one-way flow of information from a government decision-making body to other parties, within or outside government. In order for a strategy to be effective, government bodies with the responsibility of planning fossil-fuel subsidy reform will need to establish clear objectives. They may need to do this with respect to internal as well as external audiences.

4.4.1 Internal

Depending on the inclusiveness of the planning taskforce, and the political processes needed to authorize subsidy reform, it may be necessary to establish objectives for communications within government. The two primary objectives of internal communications will typically be to ensure that:

- Reform plans are understood and approved by political decision-makers
- All ministries and agencies with responsibility for implementation have a shared understanding and a shared position on key issues

4.4.2 External

An external communications strategy will aim to achieve a variety of impacts with respect to different issues, with some issues, educating and raising awareness; with others, changing attitudes or behaviours.

Educating and awareness-raising should typically educate the public about the negative impacts of the subsidy, the merits of reform and how the government will redirect subsidy expenditure (Fattouh & El-Katiri, 2012). This helps stakeholders understand the rationale for change, gives them certainty about how reform will affect their lives and reassures them that negative impacts will be mitigated. Awareness-raising about the costs of the subsidy and the benefits of reform can start at the very beginning of the policy-planning process and potentially continue up until reform takes place. Awareness-raising around reform plans will take place toward the end of the process, once plans have been finalized.

Objectives focused on changing attitudes go a step beyond awareness-raising—stakeholders not only have new information, but this information is intended to change their views in certain ways. Specific objectives will vary with country circumstances, but may include convincing stakeholders that:

- Fuel prices are determined by market forces, not the government.
- The government must act in the national interest, not to maintain popular but harmful policies.
- A history of subsidization does not make cheap fuel an ongoing entitlement.
- Cheap supply of domestically produced resources is a wasteful use of the country's resources.
- Much subsidy spending does not actually benefit the intended recipients.
- Other successful and growing economies have much higher fuel prices and are in a much stronger financial position because they do not subsidize or they subsidize less.

Objectives focused on behavioural change may be related to better targeting fuel subsidies, typically by encouraging richer consumers to purchase more expensive fuel. Otherwise, they are usually focused on minimizing negative responses to reform. These objectives will vary depending on country circumstances, but might include objectives such as: encouraging consumers not to switch to polluting traditional fuels; encouraging consumers not to spend cash immediately, where transfers have been used as a mitigation measure, thereby dampening the inflationary impacts of this policy tool; and, more generally, providing information that will lessen the likelihood of protests, riots, strikes or other disruptive actions.

4.5 What Messages Should Be Used in Communications?

Given that most fossil-fuel subsidies have been in place for decades, attitudes will usually be well established among stakeholders, even though a full awareness of the impacts of fossil-fuel subsidies can remain low. This means that in many cases a communications campaign will need to vigorously intervene in established thinking. **Effective strategies focus on a set of simple but varied messages.** These will need to be chosen with respect to the objectives of the communication strategy and, as with other aspects of reform, will vary depending on internal and external audiences and country circumstances.

BOX 28

RUSSIAN ATTITUDES TO DOMESTIC GAS AND ELECTRICITY PRICING

Russia is the world's largest producer, the largest exporter and the biggest reserve holder of natural gas. Both gas and electricity (largely derived from gas) are sold within Russia at average prices that are well below international market prices. Many Russian consumers view cheap gas and electricity as a right, founded in the Soviet era, when the government supplied this essential service with little or no tariff.

Decades of below-cost supply has left much of Russia's energy infrastructure in a dilapidated condition, as there is little incentive for service providers to invest in new production or distribution infrastructure. As a result, Russian communities suffer supply shortages and interruptions. Distribution networks are inadequate and wasteful. The Government of Russia has commenced a gradual reform program that aims to remove distortions from pricing in order to improve energy supply to consumers and businesses, and increase efficiency. This type of gradual transition can be thought of as a way to slowly send messages to energy users, that (i) prices are going up (and they ought to be prepared for this) and (ii) that this is part and parcel of a larger plan to improve the reliability of the energy sector.

Source: Laan (2011)

4.5.1 Internal

Messages targeted at political decision-makers will be most effective if they are framed to recognize the motivations of political leaders and the concerns of their constituents. In addition to a worthy economic and social rationale, leaders will be attracted to proposals that will either enhance political support, not meet with overwhelming opposition or provide opportunities to increase the economic resources that they control (Gutner, 1999). In relation to fossil fuels, leaders are often attached to consumer subsidies as a ready means of generating political support. Indeed, the appetite of politicians to supply subsidies may be more significant than demand by recipients in creating and sustaining subsidies (Victor, 2009). This means that internal messages may need to assure decision-makers that there will be alternative mechanisms for delivering support to the general population and key political constituents, following the removal of subsidies.

To achieve a strong coordination between ministries and agencies, it is important for messages to both communicate and encourage a willingness to disclose information. Leaders and officials need to agree to consult and communicate as part of the reform effort. This provides a valuable means of gauging political reactions and adjusting plans before final decisions are made. Engaging opponents of reform is usually more effective than simply trying to override their opposition (OECD, 2010a). Putting the development of options and consultation at arm's length from the executive government can be a useful way of distancing leaders from early stages of policy development, for example, through expert panels or independent think tanks or taskforces.

4.5.2 External

Externally, the most effective messages will speak to stakeholders in plain terms about the way that fossil-fuel subsidies and reform will affect their daily lives, such as the cost of living and doing business or the government services they receive. Key factors to take into account when framing messages include:

- **Messages may require targeting.** Some messages are fairly generic. Others will be more effective if targeted at a specific audience. For example, raising awareness about environmental impacts may do little for general stakeholders, but could foster strong support from environmental groups. Similarly, messages related to mitigation measures ought to be targeted at those who will be supported by them.
- **Link subsidy reform to achieving positive social and economic goals.** Fossil-fuel subsidy reform is a dry, academic idea that most people do not associate with concrete benefits. But, as explained in Chapter 3, Managing Impacts, reform will have a range of positive impacts, and liberated resources can be reallocated into other policies. Where feasible, specific social and economic impacts should be articulated as the dominant policy goals—with fossil-fuel subsidy reform being a necessary step to achieving them. Examples include: situating reform within a broader effort to improve electricity access, quality and reliability; or establishing more effective and efficient social assistance schemes to reduce poverty and promote economic growth. As explained in Chapter 2, Getting the Prices Right, p. 28, successful reforms have often been part of broader economic restructuring efforts.
- **Producer countries should take into account issues regarding ownership of resources.** In energy-producing countries, citizens often feel that they have a right to cheap energy as a share in the nation's energy wealth. A decision to increase prices needs to be accompanied by a strong reason why citizens must pay more for energy resources and what they will get in return.
- **Where possible, cultivate and demonstrate an electoral mandate for reform.** Major economic reforms in OECD countries show that an electoral mandate is an important factor for success (OECD, 2010a). Without public approval, only reforms that quickly generate tangible results have a high chance to succeed, and this is rare for structural reform. Where some electoral demand exists, it should be built into messaging. Where demand is low, governments can attempt to cultivate it with long-term communications activities. In the short term, consultation tools—such as public polls on whether and how to reform subsidies—can help cultivate and demonstrate a mandate to take action.
- **Be willing to disclose information about the planning process for reform.** Governments are sometimes reluctant to share reform plans outside of decision-making circles for fear that the information will be used against them by opponents. This concern is valid at some points in the policy cycle when options are unformed and premature release might unnecessarily alarm stakeholders. But when agreed options are shared, it provides a valuable means of gauging public reaction and adjusting plans before final decisions are made. Indeed, information is often "leaked" for this purpose.
- **Build confidence in the government as a reformer.** Governments without a strong record of implementing economic change, and without a strong history of accountability, transparency and effective public spending, may need to take extra measures to build credibility. This might include designing mitigation measures in ways that promote credibility (see Chapter 3, Managing Impacts) or by creating processes and bodies to ensure accountability. Such measures require communications to ensure that stakeholders are aware of them. Transparency about preparations can also reassure stakeholders that promised mitigation measures will be ready and work as intended.

Key messages for external audiences that have been used in communications campaigns to support fuel price reform are provided in Table 20

TABLE 20 | KEY COMMUNICATION MESSAGES TO SUPPORT FUEL SUBSIDY REFORM

Objective	Message	Rationale	Target audience(s)
Educate and raise awareness	Subsidies are costly.	Some citizens are not aware of costs.	General public
	Subsidies have high opportunity costs.	Compare subsidy costs with spending on health, education or iconic infrastructure projects.	General public
Re-educate	Fuel subsidies are regressive.	Most benefits flow to the wealthy. Funds could be used more effectively to assist the needy.	Poor consumers and consumer organizations
	Selling domestic energy cheaply has an opportunity cost; there are better ways to share resource wealth.	Challenge attitude that fossil-fuel subsidies are the best way to share resource wealth. Can also link to ideas of intergenerational justice and obligations.	General public, industry consumers
	Domestic prices are lower than neighbours or nations with similar GDP.	Citizens are often under a false impression that fuel is unreasonably expensive in their own country.	General public, fuel consumers
Educate; mobilize support	Subsidies have a high environmental cost.	Wasteful fuel consumption and GHG emissions are costly; these issues can mobilize environmental groups to support reform.	Middle and upper income groups, environmental groups
Neutralize opposition	Subsidies are lost to smuggling and corruption.	Builds public support to stop non-intended recipients from benefiting from subsidies.	General public, illegal recipients
	[Misconception x] about reform is not true.	Counter misconceptions. They can be identified with consultations, surveys and polls.	General public
Promote reform package	Compensation or mitigation will be provided.	Ensure stakeholders are aware of all measures to reduce impacts of higher fuel prices.	Mitigation recipients, consumer and industry groups
	Reform will take place according to [x] schedule and with [x] support policies.	Provide advance notice regarding how and when prices will be adjusted. Information about specific measures can be targeted at the groups who will receive them.	General public, subsidy and mitigation recipients, consumer and industry groups
	Subsidy compensation is making a difference.	Report on impacts of mitigation measures. Brand them with a distinctive name or logo.	Subsidy recipients
	The government reform package is fully funded and well-prepared.	Build credibility that promises to mitigate the impacts of reform will be followed through.	General public, subsidy and mitigation recipients
Communicate the cost of non-reform	Subsidies are fiscally unsustainable.	Show that current subsidies are unsustainable by relating to larger issues, e.g. Asian and global financial crises, sovereign debt defaults.	General population, policy community
Linkages	Issue [x] can be achieved if we reform fossil-fuel subsidies.	Articulate the need for subsidy reform by focusing on the achievement of a tangible social or economic goal.	General public, groups who benefit most from addressing issue [x]
	Reforms are relevant to grassroots priories.	Explain how reform package (higher prices, mitigation measures, changes in services) will affect real household incomes and services.	Subsidy and mitigation recipients, consumer and industry groups, unions
	Reform will improve energy security.	Can build support for reform in contexts where energy security is a political concern.	General public
Build demand for good financial management	Previous economic reforms have improved standards of living.	Put subsidy reform into context of beneficial development and poverty reduction.	Policy community

Sources: GSI, drawn from case studies and commentators including Fattouh & El-Katiri (2012); IMF (2012).

NEGATIVE AND POSITIVE MESSAGES: PROBLEMS OR OPPORTUNITIES?

BOX 29

Most messages can be framed in a negative or a positive way. For example, the message "subsidies are costly" could be reformulated as "subsidy reform will free up many resources." Policy-makers should keep this in mind and consider when a negative or a positive message is most appropriate. In some cases, negative messages can be more effective at motivating stakeholders—the field of behavioural economics has shown that individuals will often place more importance on a loss than they would an equivalent gain (Cottrell, 2012). On the other hand, messages that only focus on the negative may fail to establish a vision of what reform could achieve. A narrative of change will often combine negative and positive messages, to establish both the urgent need for change and tangible ways to take action and benefit accordingly (Halle, Najam & Beaton, 2013)

EXAMPLES OF COMMUNICATIONS MESSAGES IN EGYPT, INDONESIA AND MALAYSIA

BOX 30

Egypt compared the budgetary burden with revenues from the Suez Canal when trying to reform subsidies (Ragab, 2010).

The **Malaysian** government hosted an Open Day on subsidy rationalization in May 2010. The opening presentation, delivered by Idris Jala, CEO of PEMANDU, communicated a number of key awareness-raising messages (Jala, 2010). This included the projection that continuing subsidies would make Malaysia bankrupt by 2019, comparisons with international and regional peers, stating subsidy expenditure in plain terms (such as subsidies per household) and illustrations of the small share of funds going to intended recipients. The presentation also set out proposals for reforming subsidies. Finally, it reported on the results of a national poll regarding subsidy reform. From a total of around 190,000 respondents, 61 per cent were in favour of reform and 66 per cent stated that they would prefer a gradual pace, lasting from 3 to 5 years. The presentation used simple, clear language and bold, provocative statements, such as, "We must live in the real world" and "We do not want to end up like Greece," garnering significant media attention.

The **Indonesian** Ministry for Energy has also placed banners at most retail fuel outlets that read "Regular gasoline is a subsidized fuel—only for the disadvantaged of the society—thank you for using the non-subsidized gasoline." The message is unlikely to dissuade wealthier motorists from purchasing fuel, but it does raise awareness that subsidized fuel is not an entitlement for all consumers.

IMAGE 1 | INDONESIA BANNERS AT FUEL RETAIL OUTLETS (photo by Lucky Lontoh)

4.6 What Channels of Communication Can Be Used?

Internal communication methods will often be established and can be largely informal. Governments may, however, take any of the following measures to ensure that all internal actors speak about subsidy reform with a common position:

- List the issue for discussion at a cabinet meeting to agree on a government position and key messages, ensuring all key ministers are present or informed of the outcome.
- Have the head of government inform ministers that there is an agreed position and that they should speak with one voice, regardless of individual opinions or the views of portfolio constituents.
- Circulate talking points to ministerial offices and departments.
- Designate a central taskforce or lead department to respond to all correspondence on the issue.

Externally, an effective campaign will make use of multiple channels of communication, each chosen taking into account the type of audience it can reach. Not all messages need to be communicated by the government. It is also possible to engage recognized and respected public figures to become champions of fossil-fuel subsidy reform, talking about the issue at events and submitting opinion editorials to major newspapers. Consultation activities can also contribute to communications by facilitating participatory debate and discussion, allowing winners and losers of reform to articulate their points of view.

The two examples below illustrate channels used for broad announcements, speeches and press releases intended for the general public. Having these communicated by leaders or popular ministers will signal a high-level commitment to reform and add credibility to the government's messages. Letters to readers written by leading politicians are quite popular in some countries and can be a good way to reach a relatively wide audience. Work with journalists can also be conducted to encourage articles, op-eds and interviews on fossil-fuel subsidy reform in newspapers with high circulation.

Channel	Announcements by the first minister or high profile minister
Example	The Ghanaian communications campaign began on February 3, 2005, with then-President John Kufuor's State of the Nation address to Parliament. Announcing upcoming decisions on reform, Kufuor stressed his government's commitment to the new policies, saying that "with goodwill and sound management, whatever problems will be encountered within the short term will be surmounted, and the economy will be the healthier for this policy" (Ghana News Agency, 2005). He announced that money spent on fuel subsidies would be reallocated to social priorities. Then-Minister of Finance Kwadwo Baah-Wiredu communicated the same message in a radio broadcast: US$25.5 million would be redirected to help the needy (All Africa, 2005). Advertisements were taken out in national papers comparing Ghanaian prices with those of West African neighbours (IRIN, 2005).
Source	Laan, Beaton & Presta (2010)
Channel	Radio, television and print media
Example	A strategy to promote anti-corruption reform to government procurement in the Philippines used varied messages on different channels, recognizing that different channels would reach different audiences. AM frequency radio, the most popular media among low-income and rural groups, was used to establish "live" interaction between citizens and their elected officials in the legislature. Television, most popular with middle- and high-income groups, was used to show a television documentary targeted at policy-makers. Print media was also used to reach urban opinion makers and a nationwide advertising campaign created a brand for the reforms, promoting a tagline containing the key message of the initiative.
Source	Cabañero-Verzosa & Garcia (2009)

More detailed material, aimed to educate stakeholders, will require a longer format, as in the examples below. Nuanced aspects of subsidy reform can be publicized through booklets, training workshops or a comprehensive website. Debates in parliament or on television can also raise the profile of the issue and allow different stakeholders to put forward detailed views and arguments.

Channel	Guide on subsidies and reform targeted at citizens
Example	Indonesia's Ministry of the State Secretariat published a guide to fossil-fuel subsidies that used plain language, cartoons and clear arguments to explain the need for price increases in regulated fuels. The guide set out five key reasons for reducing the subsidies, apart from budget savings: (i) the subsidy benefits the middle class more than the poor, (ii) market prices would encourage more efficient use of fuels and less pollution, (iii) savings could be redirected to infrastructure or social spending, (iv) reform would reduce the incentive for smuggling and (v) the long-term benefit of government investing in nation-building activities.
Source	SETNEG (n.d.); http://tinyurl.com/indonesia-guideforcitizens

Channel	TV debates
Example	The BBC hosted a debate on the "World Have Your Say" program regarding Nigerian plans to reduce fuel subsidies. Participants included civil society organizations and commentators.
Source	BBC (2012); http://tinyurl.com/nigeria-documentary

Channel	Summaries of key contributions to the subsidy debate
Example	New Delhi Television Limited (NDTV) published a summary on its website of comments made by key politicians, leaders and commentators about diesel price increases in India. This drew out some of the main arguments for and against subsidy reform.
Source	Shaikh (2012); http://tinyurl.com/summary-of-responses

Advertising is the most common means governments have used to convey a concise message regarding fuel pricing. Countries have used advertisements on television, radio, newspaper, billboards and posters.

Channel	Television advertisements
Example	The Thai Ministry of Energy produced an advertisement regarding subsidized LPG for cooking. Issues raised include smuggling, illegal use in vehicles and wastage.
Source	Ministry of Energy, Thailand (2012); http://tinyurl.com/thailand-LGPadvertisement

Channel	Television, radio and print media
Example	In Nigeria, a comprehensive advertising campaign was conducted. Advertisements were run in most major national newspapers, public and private television networks and radio stations. They mainly contained messages about the potential benefits of reform. Some were starkly political. The government was criticized for its communications activities, with *The Nation* newspaper estimating the cost of the campaign at around US$13 million. It argued that it was hypocritical to spend this sum on advertising if the government could not afford subsidies. Given that Nigeria's fossil-fuel subsidies were US$13.6 billion in 2011 alone, the investment in promoting reform is relatively small. In part, however, the criticisms derived from a generally low level of trust in government, and went on to further damage its credibility. Such problems could have been averted by upfront transparency about the rationale and cost of promoting reform, as well as maintaining a more politically neutral position.
Source	Abdallah (2012); Aramide et al. (2012)

Branding will help maintain continuity through different communication channels. By employing a distinctive and memorable image, the brand will assist the public to create links between elements of the reform package. This is particularly important for compensation programs funded by reallocated subsidy funds. Ragab (2010) advocates establishing a dedicated fund from a proportion of the funds otherwise earmarked for subsidies, similar to the way that European Union-funded projects must be badged in member countries. The fund can finance infrastructure or social programs, with any project visibly branded as being financed from subsidy reallocation. This demonstrates to the public that subsidy funds have been reallocated for the public good.

Transparency is another powerful communications tool. Simply publicizing information on the costs of subsidies will encourage debate about how to better allocate resources (Laan, 2010). Budget papers should explicitly account for subsidy expenditure, including forgone revenue from tax exemptions or below-market pricing for energy. Information regarding the price breakdown for fuels helps consumers to understand how final prices are derived and what elements are under government control. Documenting fluctuating international prices of crude oil inputs can also help the public understand that market forces are shaping costs.

Channel	Websites of energy agencies
Example	Thailand's Energy Policy Planning Office (EPPO) website provides detailed information on current and historical fuel prices. Retail prices of fuel in Bangkok are posted daily. The EPPO publishes the price structure of fuels several times per week. The EPPO stopped posting information on the balance of the oil fund in the months leading up to the closely contested national election in July 2011 and has not resumed since.
Source	http://www.eppo.go.th/

Channel	"No subsidy" days
Example	On Earth Day in 2010, Brunei Daresalam sold only unsubsidized fuel for one day. Subsidized and unsubsidized prices were published alongside each other at fuel stations to highlight the difference and consumers were charged world prices.
Source	GIZ (2012)

Channel	Publishing subsidy values at fuel stations
Example	Malaysia has an ongoing arrangement to display subsidy values at fuel pumps and on electricity bills. In every fuel station, information is provided to consumers on exactly how much each litre of their fuel is subsidized—Image 2, adjacent, shows the actual price, price control and the total amount subsidized by government.
Source	GIZ (2012)

IMAGE 2 | THE VALUE OF SUBSIDIES AS A COMPONENT OF FUEL PRICE AT RETAIL OUTLETS IN MALAYSIA

Source: GSI

4.7 What Role is There for Monitoring and Adjustment?

The circumstances underlying fuel subsidy reform—energy prices, exchange rates, inflation and economic conditions—are fluid. Shifts in any one element can see public sentiment and political alliances change. Creating scope for feedback and adjustment of the strategy during implementation will make the reform process more resilient.

Given the difficulty of successfully achieving a fast-paced "big bang" style of reform, and the time it may take to establish regulations and institutions, the transition from regulated to market-based prices is likely to be an iterative process. Successful reforms often take several attempts, with each event building on previous reforms and public understanding (OECD, 2010a). This means that monitoring after each price increase can also help governments learn lessons that can feed into any subsequent stages of fossil-fuel subsidy reform or price adjustments. As explained in Chapter 2, Getting the Prices Right, and in Chapter 3, Managing Impacts, it is very difficult to accurately predict all impacts of a complex structural economic reform, so monitoring and ongoing consultation can be vital to improving future efforts. This can inform changes to pricing mechanisms, mitigation strategies or even consultation and communications strategies themselves.

BOX 31

EXAMPLE: IRAN'S RESPONSE TO SUBSIDY REFORM PROBLEMS

Iran does not appear to have built a formal monitoring and evaluation tool into its reform model, but authorities responded flexibly when problems arose. Citizens who had not filed applications by the time of the release date for funds were still eligible to do so, and would receive compensation retroactively. The Iranian media periodically published "Questions and Answers" sections dealing with issues related to the reform. Additional rations of subsidized fuel were provided to trucking companies that suffered a "price squeeze" immediately after subsidy reform, given that fuel prices had increased but the government had banned any increase in transport charges.

Source: (Guillaume, Zytek & Farzin (2011)

4.8 Summary: "Do's" and "Don'ts", and Key Tools for Building Support for Reform

✓DO's

- ✓ **Do build consultation and communication into all other aspects of planning for reform, as part of an integrated set of processes.** Establishing a fossil-fuel subsidy reform strategy is built on a full understanding of how stakeholders will be affected, how they perceive reforms, clear communication about the rationale for reform, how reform will take place and what mitigation measures will be used to support affected stakeholders.
- ✓ **Do organize internally to ensure a whole-of-government approach.** In most cases, reform will depend upon effective cooperation among a range of different ministries, as well as combining technocratic and political roles. Well-designed internal structures can help different government representatives speak with one voice.
- ✓ **Do involve political leaders throughout the planning process.** Civil servants are generally expected to stay neutral on party political issues, so a politically feasible reform plan may need strong direction from political leaders. Involvement of such figures will also signal a high-level commitment to reform and add credibility to government messages.
- ✓ **Do attempt to gauge all stakeholder views, including as thorough consultation as possible, given available time and resources.** Stakeholders can provide information that the government does not have on how they will be affected by policy change. Understanding the perceptions and preferences of stakeholders will result in more effective and politically acceptable reform plans, as well as informing communications strategies. Finally, involving stakeholders in consultations will also raise awareness and can increase senses of ownership and buy-in to government plans.
- ✓ **Do be prepared to make compromises, especially if these lead to better reform proposals.**
- ✓ **Do think about key attitudes that need to be changed in the medium-to-long term.** Some beliefs may persistently obstruct reform attempts: for example, that cheap energy is a right, that the government can control the cost of energy or that fossil-fuel subsidies are the best way to redistribute natural resource wealth. Influencing these attitudes may be a gradual process.

⊗DON'Ts

- ⊗ **Don't make too many compromises.** Reform plans must stay firm enough to achieve their goals and ought not sacrifice the principles of good governance.
- ⊗ **Don't forget to communicate about mitigation measures and credibility mechanisms.** Stakeholders will not appreciate efforts to manage the impacts of reform or efforts to build trust in government plans unless they know of them and understand them.
- ⊗ **Don't rush consultations and communications.** It will not save time later on.

TABLE 21 | SUMMARY TABLE: KEY ACTIVITIES AND TOOLS FOR BUILDING SUPPORT FOR REFORM

Activity	Type of tools	Page
Listing and categorizing key stakeholders	• List key variables: describe and/or score • Bivariate matrices: map out variables	70-71
Establishing an intra-government administrative body for reform	Potential structures include: • cabinet sub-committee • parliamentary committee • interdepartmental committee • taskforce • expert group	74
External stakeholder consultations	• Reviews of existing literature and media reports • Survey research • Interviews • Public inquiries • Discussion groups, focus groups and workshops • Roadshows • Polls • Web-based forums	76-77
Identifying key messages	Key messages include: • Educating about subsidies: – costs, inefficiencies, benefits of deregulation; comparison with other countries; impacts on poor, the environment • Neutralizing opposition: – identifying smuggling and corruption, countering misconceptions • Promoting a reform package: – explaining reforms, compensation, showing relevance to stakeholder priorities, highlighting successes • Communicating cost of non-reform • Building demand for prudent fiscal management	80-81
Communicating key messages	• Information: guides, publishing subsidy costs • Announcements and speeches • Debates: parliamentary, university, local, TV • Media: radio, television, print, websites • Events: debates, workshops, "no subsidy" days	83-85

CHAPTER 5
IMPLICATIONS FOR REFORM IN SOUTHEAST ASIA

This chapter illustrates how the principles outlined in this guidebook could be used to bolster preparations for subsidy reform in Southeast Asia.

One of the key principles of this guidebook is that fossil-fuel subsidy reform plans for any country will differ depending on a range of factors, including which types of energy are subsidized, the policy instruments used to grant subsidies, conditions of the local energy market, the political context and public perceptions. There is no one-size-fits-all blueprint for reform. At a regional level, policy advice can most usefully focus on the *planning process* to formulate a robust, country-specific reform strategy.

This chapter therefore does not attempt to propose detailed guidance for each country within Southeast Asia. Rather, it illustrates how various recommendations for planning reform could be applied to different country circumstances, taking examples from the region.

5.1 Policy Recommendations

Preparation is vital for the success of any attempt to rationalize subsidies in Southeast Asian countries. Even in cases where the political context (such as looming elections) makes it infeasible to act on subsidy reform, it is always possible to begin the basic preparations that will be needed the day that circumstances change: coordinating relevant government departments, conducting projections of impacts, gauging the views of affected stakeholders and establishing a communication strategy.

Preparation also makes it possible to act decisively and effectively when reform must happen quickly because of a sudden crisis or window of opportunity. Ideally, such preparation would be conducted well in advance of an abrupt policy change. But even where there is no prior planning, it is still possible and highly informative to conduct basic assessments of who stakeholders are, how they will be affected, what they think and how negative impacts can be managed.

Various pressures exist that may lead countries in Southeast Asia to suddenly reduce or remove subsidies. For example, countries that are net importers of a subsidized fossil fuel may see the cost of subsidies spiral out of control when international prices rise: Indonesia heavily subsidizes petroleum products, and this has put considerable strain on the state budget during periods of high crude oil prices. Political figures in Malaysia have argued that subsidy spending—of which fossil-fuel subsidies are a large part—is to blame for rising debt that could leave Malaysia "bankrupt" by 2019 (Jala, 2010). And the pressures that drive forward subsidy reform are not always fiscal. In Vietnam, electricity tariffs do not raise enough revenue to fully cover the costs of maintaining and improving the quality of supply—which is necessary to fuel its economic development, as demand continues to rise. Most countries with fossil-fuel subsidies that affect electricity prices will want to move toward overall cost-recovery, so they can better manage electricity infrastructure, at the same time as holding at least a part of electricity tariffs lower than market rates, for reasons related to economic and social development.

Many countries in Southeast Asia have already made commitments to reform fossil-fuel subsidies and produced a range of proposals and associated plans for how this can be implemented—indeed, examples of the region's innovative ideas and good practice are highlighted throughout this guidebook. But no country has published a reform plan that is strong across all three of the elements that are required: getting the prices right, managing impacts and building support for reform.

5.1.1 Getting the Prices Right

A number of countries in Southeast Asia have plans to raise the price of fossil fuels. The Malaysian government has a subsidy rationalization plan to gradually increase prices of gasoline, diesel and LPG every six months, although this was put on hold and prices have been frozen since December 2010 (Ilias, Lankanathan & Poh, 2012). It has, however, committed to reform fossil-fuel subsidies as part of its *Tenth Malaysia Plan* (EPU, 2010). Indonesia is implementing plans to reduce its fuel subsidy bill by prohibiting government vehicles and sea vessels from using subsidized fuel (GSI, 2013). And the Thai government plans to gradually raise LPG prices for all consumers to just below the world price (Platts, 2012a). Successfully implementing such plans will help reduce subsidy costs. But most countries in Southeast Asia could develop plans that do more to address underlying pricing policies. This guidebook outlines two components of good fossil-fuel pricing:

1. Transitioning to market-based prices for fossil fuels.
2. Creating and enforcing a competitive and efficient energy market.

Some countries, such as Indonesia, Malaysia and Thailand, subsidize petroleum products by setting retail prices on an ad hoc basis or imposing price caps. Plans to reduce subsidies via a one-off move from one ad hoc price to another will not fully address the subsidy problem. **A good plan for reform will not just increase fixed prices—it will set out a roadmap for moving toward a market-based pricing mechanism.** This should involve good practice across the four dimensions of energy pricing: no subsidization, allowing domestic prices to match changes in international prices, being transparent and being properly enforced. It would be difficult for most countries to move toward such a pricing system in one step. This means that **it may be necessary for transition roadmaps to identify intermediary steps in the path towards market-based pricing.**

Attempts to better target subsidies—such as Indonesia's plans to deny subsidized fuels to government vehicles and sea vessels—can be an effective way to reduce short-term costs. However, targeting can be difficult to enforce and rarely applies to the highest-cost and most politically sensitive consumers. It also does nothing to change the underlying pricing system. Experience from within the region—the Philippines, Thailand and, to a lesser extent, Vietnam—shows that oil price stabilization funds, too, tend to encounter problems during prolonged periods of increasing international oil prices, raising too little revenue when prices are low and spending too much to smooth prices when they are high.

Formula-based automatic pricing mechanisms can be a useful intermediary step towards reaching market-based pricing. Adopting a formula-based automatic pricing mechanism makes prices more responsive to short-term market changes and introduces consumers to fluctuating prices, while lowering subsidy costs. It also provides options to smooth out price volatility, which may be important to help accustom economic actors to adapting to regular price changes. Automatic pricing mechanisms are, however, not without problems and should only be used as a transition phase.

The "right" level of taxation on fossil fuels will be a key consideration for most countries. It will be set to balance many competing aims of policy, such as raising general revenue, supporting economic and social development, reducing the incentive to smuggle fuels within the region and supporting environmental objectives. The Philippines successfully phased out its price subsidies in the late 1990s as part of its wider structural reforms to deregulate the downstream oil sector, but it maintains excise tax exemptions for "socially sensitive products"—diesel, bunker fuel, kerosene and LPG—as well as an import duty exemption for LPG (Mendoza, forthcoming).

Undertaking structural reforms to create and enforce a competitive and efficient energy market can help drive down energy prices at the same time that subsidies are phased out. Vietnam's plans to progressively reform the electricity sector, for example, are designed to create conditions whereby a range of investors are encouraged to build system capacity, operating this "at profit" to create more investment potential (Mayer Brown JSM, 2011). Other countries should consider making the creation of a competitive market part of discussions about energy pricing reform—drawing on how it would affect reform in areas such as costs and volatility, energy security and local and global environmental impacts.

5.1.2 Managing the Impacts of Reform

In order to effectively protect low-income groups and support sensitive sectors such as energy-intensive industries, a subsidy reform plan must first estimate the direct and indirect impacts of subsidy reform. **The GSI recommends that a combination of quantitative and qualitative measures be used, including simple static models, such as PSIAs, and more complex dynamic models including CGE modelling and energy sector models.** For example, in Vietnam, a revised electricity lifeline tariff regime has been published (Thang, 2012), and evaluations could be used to estimate its effectiveness in providing targeted support to the most vulnerable. In addition, qualitative research through surveys could help the government better understand the impacts of reform on all sectors of the population and businesses across the economy, with particular focus given to migrant workers and the informal business sector. Discussing reform with affected groups, including how they would prefer to be compensated, could help improve policy effectiveness and stakeholder acceptance.

Fostering open discussion about the impacts of reform and potential mitigation measures can improve the quality, credibility and popularity of reform plans. It can also be an opportunity to accentuate positive messages that show how the government's strategy is in the interests of the majority and will not harm the poor and vulnerable. For example, the Indonesian government commissioned three universities to provide research inputs for its planning on fossil-fuel subsidy reform. The results, however, were not published. Making this kind of information publicly available would bolster Southeast Asian governments' efforts to raise awareness about subsidies, the impacts of reform the most appropriate mitigation measures.

Mitigation measures fall into three main categories:

- ***How* the reform is implemented:** A gradual phase-out of subsidies, for example, over a 12-month period would reduce the impacts for each individual price increase. If subsidies exist on several types of fossil-fuel products, the impact of removing subsidies can differ for each one, and careful sequencing can help mitigate impacts. It may be best to focus first on those fuels where subsidies are the most regressive (i.e., where the largest share of benefits accrues to the wealthiest parts of the population). In Thailand, for example, more effective and efficient policies could be established to support the public transportation sector, rather than universal subsidies for NGV and diesel. NGV credit cards are a positive step towards targeting subsidies and a similar scheme could be launched for sensitive sectors that use LPG (e.g., street vendors) and diesel. Targeted fuel subsidies, however, are not a perfect solution for mitigating impacts. Just as when they are used as a tool to gradually change prices, they can create incentives for illegal use and corruption, may be difficult to enforce and rarely apply to largest and most politically powerful groups of fossil-fuel consumers.
- **Alternative social and economic assistance policies:** Many policy instruments can and have been used to manage the way that reform affects low-income households, vulnerable groups, businesses and key macroeconomic indicators such as inflation. For example, a survey of civil society groups in Indonesia identified increased expenditure on health and education, poverty reduction programs, investment in infrastructure and agriculture, environmental protection and disaster management as favoured options for reallocating the savings from subsidy reform (Braithwaite et al., 2012). A number of Southeast Asian countries, such as Vietnam, could expand the scope of reform plans to include policies, such as extending existing social welfare schemes, to protect vulnerable energy consumers, and supporting energy-intensive businesses to improve their energy efficiency.
- **Measures that counteract price rises:** A range of measures could be used to drive down prices. In Indonesia, for example, this could include wider plans to deregulate the downstream sector, improve domestic refining capacity, and improve distribution networks, energy-efficiency and diversification programs. Many countries across the region, including Indonesia, Malaysia and Thailand, could use subsidy savings to increase investments in public transport networks.

5.1.3 Building Support for Reform

One of the biggest challenges facing policy-makers is opposition from political parties, lobby groups and major stakeholders. Policy-makers can take proactive steps in the form of effective consultation and communications strategies to create the political space that makes reform possible.

Implementing an effective and sustainable reform plan requires a whole-of-government approach. All relevant ministries and agencies need to be well coordinated, agree on reform plans and communicate consistent messages. But a number of Southeast Asian governments that have committed to reform have not developed mechanisms for strong internal coordination. The Thai government has cabinet subcommittees responsible for energy policy and administration. A useful complement to these would be an interdepartmental body to develop the subsidy reform strategy and oversee implementation. Countries without strong administrative arrangements for decision-making on energy issues could consider establishing a cabinet sub-committee on subsidy reform supported by a dedicated taskforce.

Effective communication strategies also need strong leadership. In Indonesia, for example, senior members of government have sent mixed signals about reform plans (Hamdani, Lontoh, Pusakantara & Vis-Dunbar, 2012); and in Vietnam, strong internal communication between government agencies could ensure more consistent policies. In this case, designating a national spokesperson to speak on the issue, ideally housed in the office of the president or vice-president, would help avoid confusion.

Good practice consultations will engage with stakeholders on substantive issues through roadshows, public inquiries, discussion groups and workshops. At a minimum, governments can gauge stakeholder views through reviewing available information in policy literature and media, and meeting with experts and representatives of key stakeholder groups. Key stakeholders in Thailand, for example, would be low-income earners, street vendors, taxi drivers and truck companies. In Malaysia, it would include fishermen, the urban poor, populations in the low-income states Sabah and Sarawak, and sensitive sectors such as transport and manufacturing. Consultations can provide information about how stakeholders will be affected by reform as well as preferences for how impacts should be mitigated. In Indonesia, for example, use of cash transfers has been controversial (Beaton & Lontoh, 2010; Braithwaite et al., 2012). Consultations could either help identify alternative mitigation measures or identify misconceptions about cash transfers that must be addressed in government communications.

An effective communications plan focuses on simple but varied messages, conveyed through a variety of channels. The exact messages and channels will differ according to country circumstances. A communications plan for Vietnam, for example, where subsidies are related to state-owned energy companies, could focus on increasing transparency about the costs and financial accounts of these companies. This would pave the way for calculating and publicizing the impacts of changes to electricity tariff structures, and explaining the basis for proposed electricity prices, taxes, levies and smoothing mechanisms. Communications could include messages that prices are likely to rise, giving consumers an idea of how and when, and improving the debate and level of acceptance around pricing decisions.

Some countries in Southeast Asia have undertaken extensive outreach and communications, but these could often be improved or expanded. Malaysia, for example, has engaged in a number of extensive communications activities around its Subsidy Rationalization Plan (Jala, 2010), but could complement these by improving transparency around its pricing policies by publishing the formula used to determine subsidies and sales tax exemptions granted to fuel suppliers and retailers. Thailand could expand its existing communications (currently focused on LPG misuse and smuggling) to include messaging on the share of subsidies captured by the wealthy and how funds could be better spent to assist the poor or sensitive economic sectors. In Indonesia, public debate has been somewhat limited to budget and fiscal issues. This could be diversified to include messaging on the cost of smuggling and illegal use of subsidized fuels. Indonesia also needs to address underlying public perceptions that cheap fuel is an entitlement due to the country's resource wealth, an attitude that has become untenable since Indonesia became a net oil importer.

It is also important to articulate positive messages. Many countries, like Indonesia and Thailand, could improve communications by highlighting how subsidy expenditure could be better spent, such as targeted assistance to the poor or reducing urban traffic and pollution. During reforms in the Philippines, the government identified a range of tangible examples that the public could relate to, including free rice for 17.6 months for the poorest 30 per cent of the population, 62,2411 new school houses, 5,280kms of rural roads, 146,080 deep wells for drinking water or two light rail transit lines (Beltran, 2012). Indonesia's communications activities have stressed that subsidies disproportionately favour wealthier consumers. This is an important message, but more could be done to highlight benefits of reallocating subsidy spending, such as better roads, schools and healthcare. Vietnam could formulate positive messages about electricity reforms, including increased growth and resilience across the economy, financially stable and competitive state-owned enterprises, as well as a more stable electricity supply, cleaner electricity and lower imports.

Consultation and communication efforts need to be integrated throughout the reform process. Gauging views, raising awareness and changing attitudes can take time, and feed into all other aspects of preparing for fossil-fuel subsidy reform, so it is important to start early in the process. In cases where governments are waiting for a political opportunity to reform subsidies—for example, Malaysia's next national elections are in 2013 and Indonesia's in 2014—policy-makers can still begin communications about the nature and cost of subsidies and the benefits of reform. This will lay the foundation for when the next reform process can begin.

5.1.4 Information Sharing and Peer Learning

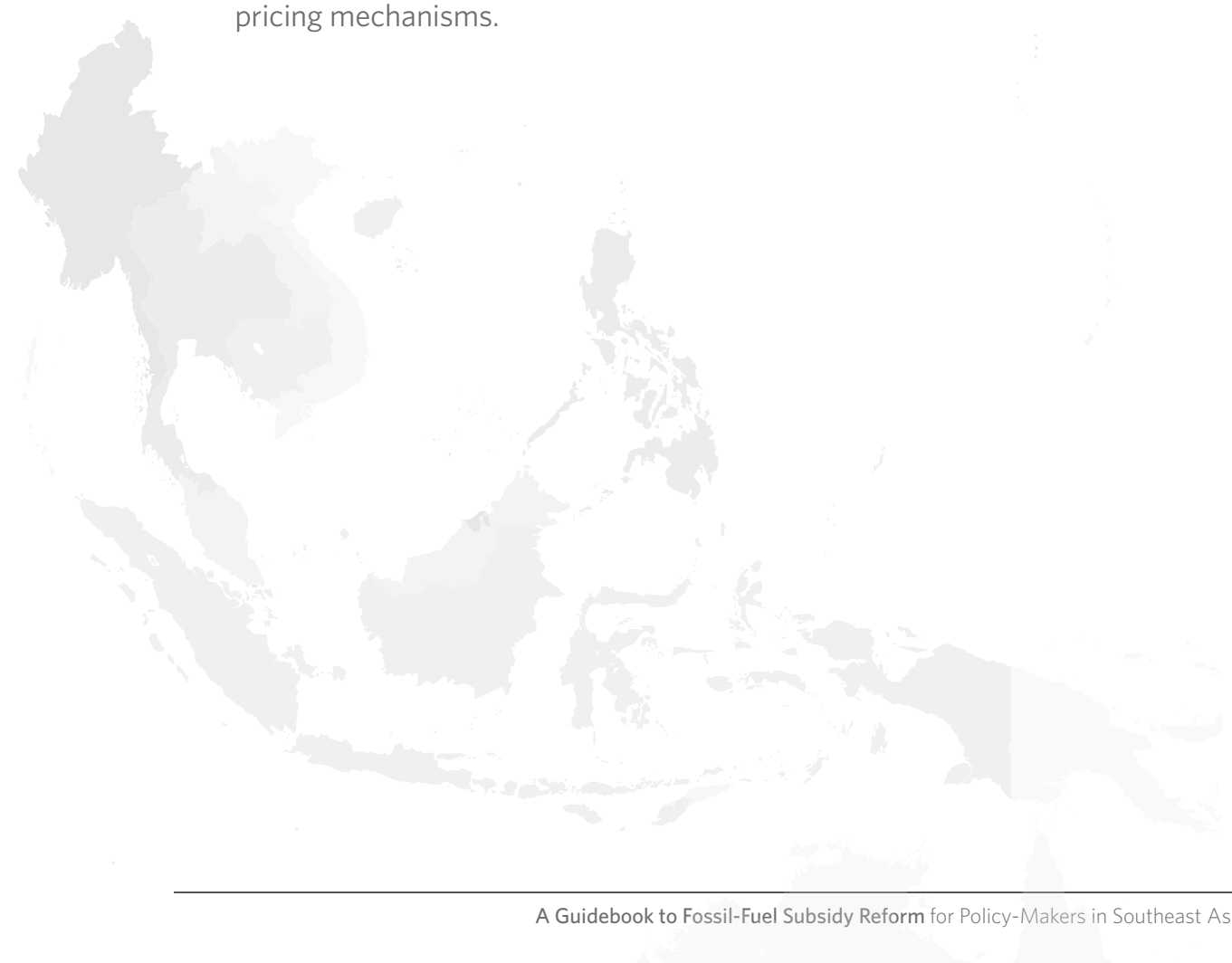
Finally, Southeast Asian countries have a wealth of experience in reducing and reforming fossil-fuel subsidies and can learn much from one another's experiences. Opportunities for increased policy dialogue and sharing case studies would help replicate successes and share the lessons that have been learned.

ANNEX A
AN INTERACTIVE EXERCISE ON FUEL PRICING MECHANISMS

This Annex sets out an interactive exercise that can be used to explore pricing mechanisms with a group of policy-makers or other stakeholders.

It consists of:

- An explanation of the four dimensions of energy pricing policy, as explained in Chapter 2, Getting the Prices Right, through the use of Chernoff faces.
- Instructions for using Chernoff faces to help facilitate a discussion of fuel pricing mechanisms.



The path to fossil-fuel subsidy reform depends on which pricing policies are being used to subsidize individual fuels. As explained in Chapter 2, Getting the Prices Right, the Global Subsidies Initiative (GSI) breaks down pricing into four dimensions by which a country's policy can vary, adapted from a framework originally put forward by the German Agency for International Cooperation (GIZ, 2012) in the context of motor fuel prices. The four dimensions of fossil-fuel pricing are:

1. **Subsidies** The degree to which subsidies reduce the end-price of fuel by shifting costs onto the government, state-owned energy companies, private energy companies or other actors.
2. **Pass-through** The degree to which domestic pricing fluctuations match international price changes—literally, the degree to which an international price change is "passed through" into prices domestically.
3. **Transparency** The degree to which the composition and regulation of energy prices is open and transparent.
4. **Enforcement** The degree to which fuel pricing in real life actually follows officially adopted energy pricing arrangements.

In addition to this, many countries have a mechanism in place that determines **how prices change**—such as ad hoc price changes by government, automatic pricing mechanisms, price stabilization funds and market-based pricing.

By splitting up pricing policies into these different dimensions and thinking about the mechanisms that determine how prices change, it possible to have a much clearer and focused discussion on what parts of a pricing policy require reform and how each part may require different efforts and timescales to achieve change. A discussion about pricing policies can, however, quickly become dry and academic, with participants not sharing a common understanding of terms, and getting confused as participants move from one dimension of pricing policy to another. This annex therefore sets out an interactive exercise that can be used to explain the different elements of pricing policy and help policy-makers and stakeholders engage on the issue. It can also be used to help illustrate how the pricing policies of different countries operate in different ways.

The exercise must begin by, first, explaining pricing dimensions via the use of Chernoff faces: a technique to represent multidimensional data using human faces (Chernoff, 1973). Since this Annex is based on the GSI's four dimensions and pricing mechanisms, the exercise is focused specifically on the pricing of petroleum products, though it could be adapted to discuss the pricing of other fossil fuels. Second, the annex sets out instructions for an interactive exercise that gets a set of participants to use Chernoff faces in order to explore how a pricing policy might need to change following an external price shock.

Explaining Pricing Dimensions with Chernoff Faces

Paraphrasing the famous opening sentence from Leo Tolstoy's "Anna Karenina," it is possible to say that "happy energy markets are all alike, but every unhappy energy market is unhappy in its own way."[6] A "happy energy market" can be represented in the following way:

This represents a country with no subsidies, full pass-through of international prices, full transparency and good enforcement. Prices change according to the market.

Every unhappy market is indeed "unhappy in its own way," with one or several elements of "happiness" missing across four dimensions. In addition, prices may be changed with a variety of mechanisms.

DIMENSION 1: SUBSIDIES

The first and perhaps most important dimension of fossil-fuel pricing is the degree to which subsidies shift costs away from consumers. And as explained in Chapter 1, Fossil-Fuel Subsidies for Energy Consumers in Southeast Asia, subsidies can be conferred in a broad variety of ways. Assuming that subsidies do exist, these are represented according to what is being held to the left of the Chernoff face.

A face holding a *lock* represents a country that confers subsidies through fixed, below-market prices. The policy might hold prices at a certain level, cap prices or require other actors, such as state-owned or private energy companies, to fix or cap prices. Such subsidies are often paid for through government revenues, foregone spending or losses on the accounts of energy companies.

A face holding a *sign with the word "taxes" crossed out* represents a country where subsidies are conferred through tax exemptions or reductions. For governments, such provisions are a deviation from the tax rate that has been deemed nationally appropriate and they incur a cost through foregone revenue.

A face holding a *gift* represents a country where subsidies are conferred through monetary transfers or credits bundled with fuel purchases or in the form of in-kind rations. The latter option is more common for electricity.

[6] Tolstoy's original sentence was about happy and unhappy families.

DIMENSION 2: PASS-THROUGH

The second dimension of pricing is the degree to which governments control the pass-through of international price fluctuations onto domestic markets. This can be represented according to the sign held on the right hand side of the Chernoff face.

All countries that fail to pass-through prices 100 per cent must, by definition, be subsidizing. However, not all countries that subsidize must be reducing pass-through. For example, a government might allow domestic prices to go up or down in ways that exactly match international prices, but still hold domestic prices a fixed amount below their international equivalents.

A face holding a *sign that reads "100% pass-through"* represents a country that fully passes through all international price fluctuations.

A face holding a *sign that reads "no pass-through"* represents a country that allows no pass-through of international price fluctuations.

Countries that allow some but not full pass-through can be represented by a face holding a *sign that shows the appropriate percentage of pass-through.*

DIMENSION 3: TRANSPARENCY

The third dimension of pricing is the degree to which the composition and regulation of energy prices is transparent. Dark glasses are used to indicate the level of a country's transparency:

A face wearing *no sunglasses* represents a country with a policy that has fully transparent composition and regulation of energy prices.

A face wearing *sunglasses* represents a country with a policy that has wholly non-transparent composition and regulation of energy prices.

Countries that have between full and no transparency with respect to price composition and regulation can be represented by a face wearing *sunglasses that partially cover the eyes.*

DIMENSION 4: ENFORCEMENT

The fourth dimension of pricing is the degree to which fuel pricing in real life actually follows officially adopted energy pricing arrangements. For instance, most countries that implement dual pricing of fuels have failed to prevent the emergence of black energy markets. Even countries with no subsidies need to enforce anti-trust regulation and ensure fair competition in energy markets in order to prevent collusion of suppliers and monopolistically high energy prices.

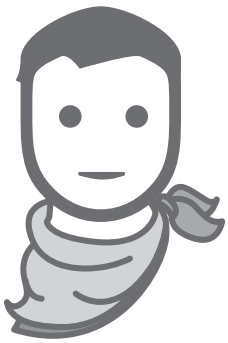
A face wearing a hat firmly on its head fully enforces its energy price regulations.

A face wearing a hat that is cocked to one side fails to fully enforce its price regulations.

HOW DO PRICES CHANGE? PRICING MECHANISMS

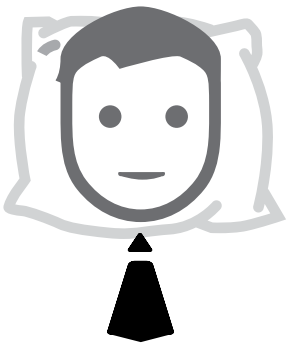
Finally, a discussion of fossil-fuel pricing will often want to focus on the mechanism by which prices are changed. Who decides when prices should rise or fall? Who decides how they should rise or fall? Pricing mechanisms are represented by various items of clothing worn around the neck.

A face wearing *no item of clothing around its neck* represents a country that has market-based pricing: prices are determined according to the interplay of supply and demand, and governments have no opportunity to intervene in this process.



A face wearing a *bandana around its neck* represents a country that has ad hoc pricing: governments exercise "manual control" of price changes on an arbitrary basis.

A face wearing a *tie around its neck* represents a country that has a formal, automatic pricing mechanism: prices change automatically, according to a predetermined formula, with no or little intervention from government.



A face wearing a *tie around its neck and a cushion beneath its head* represents a country with an automatic pricing mechanism and a price stabilization fund: collecting taxes when international prices are low, and disbursing funds to dampen domestic prices when international prices are high.

ILLUSTRATING PRICING POLICIES WITH CHERNOFF FACES

The examples below show how the different symbols can be used together to illustrate a country's pricing dimensions and pricing mechanism.

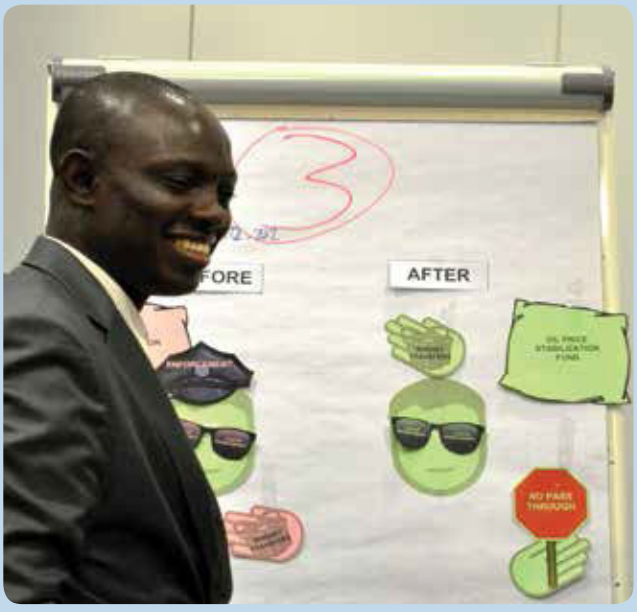
China has a non-transparent, formula-based pricing system. It only passes through international price changes if prices vary more than 4 per cent since each monthly review, and reserves the right not to pass-through changes at all. Subsidies exist when domestic prices have not caught up with international prices. If international prices are over US$130, tax breaks are used to help keep prices low. Subsidies have led to huge losses for state-owned refiners. See p.33 for details.

The Philippines has a transparent, market-based pricing system, although some elements of price enforcement can still be improved. It continues to provide some subsidies through tax exemptions. See p.29 for more details.

CONDUCTING AN INTERACTIVE EXERCISE WITH CHERNOFF FACES

Chernoff faces can be used in interactive exercises to facilitate discussion about pricing mechanisms. Such exercises can be useful for the following reasons:

- **Rigour:** using visual markers to separate elements of a pricing system can help participants keep focused on using common terms and distinguishing between them rigorously.
- **Dynamism:** combining discussion, movement and visual markers helps to foster interest and concentration on what can otherwise be a dry and academic set of ideas.
- **Contrast:** the use of visual markers is an effective way to compare and contrast pricing regimes in different countries or at different times.



GIZ-GSI Workshop on Smart Fuel Price Regulation, November 2012. Photo by Patricia Lauko, GIZ.

FACILITATING THE EXERCISE

The exercise described in this Annex takes place in the following steps:

1. Facilitators give a short presentation on the different dimensions of fossil-fuel pricing and how Chernoff faces can be used to describe them.
2. The exercise is introduced and participants are split up into small groups, each dealing with the pricing regime of a specific country. At least one person in each group should be highly familiar with the pricing system of the country in question.
3. The groups discuss the challenge set out by the exercise, constructing an appropriate Chernoff face (or faces), to reflect their thoughts on pricing, annotated with notes as necessary.
4. A plenary session is held. Each group is invited to report back and general discussion takes place.

An exercise ideally requires the following:

- Three to five groups, each containing three to six people
- Handouts including a written copy of exercise instructions
- Flip-charts, post-its, pens and sellotape or pins
- Cut-outs of the symbols that can be used to represent different aspects of a country's pricing system
- Flip-charts, post-its, pens and supplies for attaching cut-outs to the charts (scotch tape, pins, etc.)

For a large, printable images of the different symbols required to build a fossil-fuel pricing Chernoff face, you can download a resource pack from the GSI website: http://www.iisd.org/gsi/sites/default/files/ffs_resource_chernofffaces

Workshop on Smart Fuel Price Regulation, November 2012. Photo by Patricia Lauko, GIZ.

INSTRUCTIONS FOR INTERACTIVE EXERCISE: THE $50 OIL PRICE SHOCK

In order to better understand the nature and role of various fuel pricing schemes, as well as political, regulatory and public reactions, this exercise takes the volatility of price changes to an extreme case: a sudden price increase of $50 per barrel. It explores: how will different pricing systems react to such a situation? What difficulties and opportunities may appear?

In breaking news....OPEC has officially confirmed the WikiLeaks announcement that Saudi Arabia's recoverable oil reserves have been overstated by 40 per cent: http://www.youtube.com/watch?v=UL61zYKvWq0

Assume that it is unclear how long the higher price level will prevail, and regulators must act within a given time frame (doing nothing is not considered an option). Discuss in groups the following question:

How will the pricing scheme in your country respond to this price increase?

Use the provided cut-outs to show the pricing mechanism in your country "before" and "after" the shock.

1. **Start by choosing the pricing mechanism:**
   - Market-based pricing (nothing)
   - Ad hoc price (bandana)
   - Price formula (tie)
   - Oil stabilization fund (cushion)
2. **Then add four dimensions of pricing:**
   - How subsidies are conferred (hands holding a lock, a no taxation sign or a gift)
   - Degree to which governments allow full price pass-through (signs showing pass-through)
   - Degree of transparency (fully, partially or not at all covering the eyes with dark glasses)
   - Degree of enforcement (straight or lop-sided hat)

Notes or extra details can be appended using pens and post-its.

Example:

A pricing policy with:

- Ad hoc pricing (bandana)
- Subsidies conferred by monetary transfers or hand-outs (gift on left side)
- No pass-through (stop sign)
- No transparency (dark glasses)
- Only partial enforcement (lop-sided cap)

A pricing policy with:

- Market-based pricing (no bandana or tie)
- No subsidies (nothing on left side)
- Full pass-through (100% pass-through sign)
- Transparent prices (no dark glasses)
- Fully enforced (cap on straight)

Each group has **30 minutes to complete the exercise** and will have up to **15 minutes to report back**. Each group should nominate one person to present their results.

ANNEX B
MODELLING THE IMPACTS OF SUBSIDY REFORM

This Annex provides additional detail on the three analytical approaches that are typically used to quantitatively assess the impacts of energy pricing policies and measures:

1. Simple analysis based on economic databases
2. Computable general equilibrium (CGE) models
3. Energy sector models

The Annex summarizes the capabilities, strengths and weaknesses of the common approaches in Table B1, overleaf. More details on each of the approaches are then presented. Specific details are also given on factoring pollution impacts into modelling exercises.

TABLE B1 | CHARACTERISTICS OF COMMON APPROACHES TO MODELLING THE IMPACTS OF ENERGY PRICE RISES*

			Accessibility and typical users		
		Data source(s)	Data availability	Accessibility & typical users	Resources required
Analytical Approach	Simple analysis based on economic databases	Income and expenditure survey	Surveys conducted in all countries, typically every one or two years. Data generally publicly available.	Widespread use by policy analysts, academics, consultants.	Useful analysis achievable within two weeks from receipt of survey.
		Input-output (I-O) table	Tend to be built by national statistical agencies, every 5–7 years. Data can thus be out-of-date.	Specialized use, generally research institutes, independent or linked to government.	Experienced analyst could model impacts within 4 weeks of receipt of table.
		Social AccountingMatrix (SAM), derived from System of National Accounts	Available from national statistical agencies or orgs. such as the World Bank, every 5–7 years. Data can thus be out-of-date. Less used than I-O tables.	Specialized use, generally by economic research institutes, independent or linked to government.	Not always available. If available, likely to need additions to matrix or external analysis. Experienced analyst needs up to three months.
	Computable General Equilibrium (CGE) Model	SAM and/or I-O table	Data from I-O tables or SAMs, so often out-of-date. Relies on additional information, econometric relationships, assumptions and ad hoc adjustments, for consistency across monetary flows (all needing judgement).	Highly specialized. Usually limited no. of CGEs in a country, often developed and maintained by MoF, Central Bank, academia, MDBs.	Building and calibrating a CGE can take up to a year for a small team. Existing models likely to need adaptations to model subsidy reform. Expert user would need at least four months.
	Energy sector models, e.g. MARKAL,WASP***	Energy statistics, demand and supply projections	Data typically available, from a number of sources.	Specialized use, generally by energy research institutes, independent or linked to government.	Building and calibrating new model averages four months. Existing models likely to need adaptation. Expert user would need about two months.

* Measuring the impact of mitigation options is also constrained by what the various approaches include and exclude. The approaches can generally give some quantitative results on how some mitigation measures may perform, but others will need additional analytical approaches (quantitative and qualitative, see Chapter 3, Managing Impacts)

** It is possible to derive a simple measure of inflationary impact for the economy as a whole by applying the consumer price index (or equivalent) formula, which weights the share of expenditure. The figure derived may be more or less representative of specific groups of consumers.

*** Models can also look at part or parts of the energy sector—for example, the oil market or the natural gas supply chain

**** Specialized energy models (for example partial equilibrium models for a particular fuel, or multi-energy sector models such as MARKAL) tend to model parts or all of the energy sector in much greater detail than approaches based on economic databases and models. A full analysis would see a combination of economic and engineering models used.

Source: GSI, drawing on inputs from Coady (2006), Markandya & Hunt (2003) and World Bank (2010).

Model captures impacts on...			Impacts modelled		
Price effects? **	Energy consumption?	Households and economic sectors?	Social	Economic	Environmental
Direct impacts only. Static analysis. Assumes no change in demand or supply.	Yes, by individual fuel.	Households disaggregated, notably by income group & location. Other sectors not included.	Very useful for poverty analysis, does not assess employment or energy access	No	No
Direct and indirect impacts. Static analysis. Assumes no change in supply or demand.	Electricity separate, fuels usually merged into a limited number of categories.	No disaggregation of households, e.g., by income, location, but good sector coverage.	Only shows impacts on all households; does not assess employment or energy access	No	No
Direct and indirect impacts but electricity and fuel expenditure not usually explicitly included. This requires additional on-line or off-line calculations.	Not included in standard SAM.	Usually no disaggregation of households by income group, location, etc. Coverage of economic sectors at aggregated level.	No	Good representation of impacts on government finances and trade for economy as a whole	No
Direct, indirect and some induced impacts. Dynamic analysis. Supply and demand change. Impacts of energy price rise reported as part of overall impacts rather than separately.	Electricity separate, fuels usually combined into a limited number of categories.	Can disaggregate households by income (built into model or using the Gini coefficient) but not location. Coverage of economic sectors at aggregated level.	Usually shows impacts on all households. Usually varies wages to keep equilibrium, so employment impacts are partial. Cannot assess energy access impacts.	Yes, but does not tend to model capital and labour markets	Usually headline indicators such as CO_2, NOx, SOx. Doesn't model alternative fuel production or resource stock impacts.
Direct and indirect impacts for energy sector only. Dynamic analysis, projects impacts over time. No demand response to price changes.	Depends: ranges from simple representation of consumer types to detailed disaggregation of consumer groups.	Representation of economic sectors can vary from aggregated to highly disaggregated, very detailed coverage of electricity and fuel sectors.****	No	No, but can use multipliers for energy sector, and some models can use a macroeconomic add-in	Pollution and alternative fuel production. Projects that of fuel which can be used to project stock changes

SIMPLE ANALYSIS BASED ON ECONOMIC DATABASES

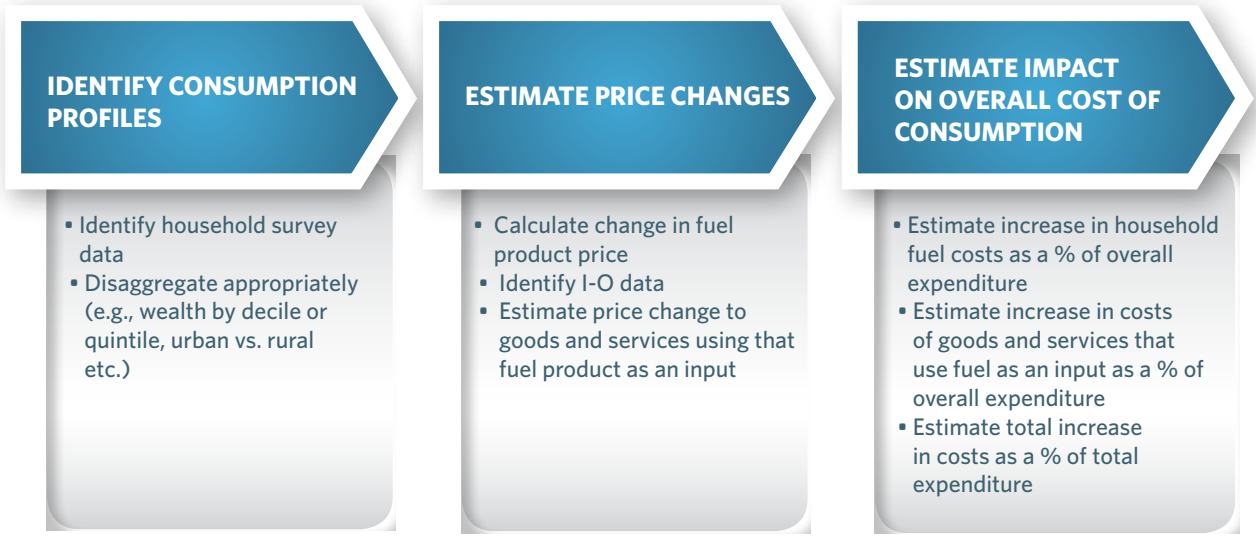
There is a range of economic databases that can be used to conduct a simple analysis of the impacts of fossil-fuel subsidy reform. The most common databases that can be used in this way are:

- Income and expenditure surveys
- Input-output (I-O) tables
- Social accounting matrices (SAMs).

Income and expenditure surveys tend to be the most widely available and up-to-date of these databases, with I-O tables and SAMs being built less regularly and typically being used by more specialized researchers. Simple analysis tends to use databases in one of two ways: either identifying the extent to which different groups in an economy are using fuels, and thus identifying groups who will be most affected by reform, or by changing fuel price inputs and identifying how this would increase the expenditure of groups across an economy, assuming no demand response. This makes them a useful way to explore first-order impacts, especially given the extent to which they typically allow for a significant level of disaggregation of households and sometimes sectors. Simple methods will not, however, allow for the projection of impacts through time or predict the outcome of complex economic relationships.

Databases can also be combined to allow for more useful analysis. Coady (2006) describes an approach that estimates changes in the price of goods and services that use fuel as an intermediate input, based on I-O data. The approach captures first-order impacts only, assuming that most second- and third-order responses will improve welfare. It is simple and not resource intensive, estimated at only two-person weeks once the basic data have been collected and processed. The approach is routinely employed by the International Monetary Fund in the course of Poverty and Social Impact Assessments of fuel subsidy reform. In common with analyses based on single economic databases, it is most useful for short-term impacts.

FIGURE B1 | SIMPLE ANALYSIS BASED ON ECONOMIC DATABASES: POVERTY AND SOCIAL IMPACT ASSESSMENT



Source: Coady (2006)

CGE MODELS

A general equilibrium approach models supply and demand behaviour across all markets in an economy. It uses the same core economic databases that can be used to conduct a simple analysis and is typically conducted using CGE models. Coady (2006) describes an alternative "shadow pricing" method, which is less resource-intensive, but provides less detailed analysis of indirect impacts; and the World Bank (2010) notes that the Revised Minimum Standard Model can be used to assess the impact of reform on fiscal balances, trade flows, external sector accounts and the real sector.

This type of approach requires a large amount of detailed data on market behaviour, across all economic sectors and including factors of production and international trade. The World Bank (2010) argues that the most appropriate databases to underlie models are SAMs, which provide the highest possible disaggregation of energy activities and products. Ellis (2010) emphasizes the importance of ensuring that data on key economic sectors, particularly energy-intensive industries, should be included in a disaggregated manner, such that it is possible to determine specific impacts on each one. General equilibrium models are time- and resource-intensive to construct. However, once designed, they can be adapted relatively easily to explore the short- and medium-term economic impact of most policy reforms.

The advantage of a general equilibrium approach is that it allows for indicators on a full set of impacts across an economy—not only household incomes, but also macroeconomic effects, such as inflation and estimates on how specific economic sectors will respond and how they will be subsequently affected. Typically, CGE models assume full employment, but they can be modified to allow for less-than-full employment, allowing employment impacts to be projected as well. The approach estimates all direct and indirect impacts, and follows impacts through time, allowing for a distinction between first-, second- and third-order effects. On this basis, the World Bank argues that general equilibrium analysis is the most appropriate way to estimate the macroeconomic impacts of subsidies and their reform (World Bank, 2010).

While recognizing the advantages of a general equilibrium approach, Coady (2006) cautions that policy-makers must keep in mind that the data that is used to build such models is far from perfect: some parameters are not known, requiring "guesstimates" on the part of modellers. The models essentially project current data, without fully accounting for feedbacks. Strong critical thinking is needed to ensure that the relationships of key importance to the reform are adequately accounted for. Sensitivity analysis should be conducted to reflect uncertainties. Due to the complexity of the approach, it may also take some time to conduct the analysis, which may not be possible if prompt assessment is required.

"EXTENDED" PARTIAL EQUILIBRIUM OR "LIMITED" GENERAL EQUILIBRIUM

An extended partial equilibrium or limited general equilibrium approach models behaviour in a limited subset of markets or limited supply and demand responses. It represents a "halfway house" between a simple partial equilibrium approach and a more time- and resource-intensive general equilibrium analysis. It is principally of relevance when the subsidies of the impacts of subsidy reform are limited to a core set of related markets. It requires data on supply and demand elasticities of the markets in question.

Coady (2006) describes two kinds of approaches: multi-market models and demand-side models.

- **Multi-market models** allow for both supply and demand changes in response to price reforms, but only in a subset of closely related markets. This captures direct and indirect impacts, but only in these markets. If fuel subsidies are non-discriminatory, this is not likely to be useful for assessing the impacts of reform, as broad subsidies would be expected to have broad effects across an economy. However, it may be useful for the reform of fairly focused subsidy policies where, for example, fuels such as natural gas or industrial oil products are supplied at low cost to energy-intensive industries.
- **Demand-side models** look across all markets but only allow for demand responses (i.e., it is assumed that price increases are all fully passed on to the price of final goods). In assessing macroeconomic reforms, this method is typically used to estimate how levying indirect taxes on different goods will have different welfare impacts, through the knock-on effects on consumption choices. In the context of fuel subsidy reform, it can be used to explore the impact of households reducing consumption and switching to use other products following reform. Since it does not account for changes to factors of production, it does not estimate impacts in areas such as employment and investment in capital.

ENERGY SECTOR MODELS

Energy sector models range from simple models looking at a single fuel market in isolation to integrated models looking at the whole energy system.

A partial equilibrium approach focuses on the fuel market as if it operates in isolation from the rest of the economy. It estimates direct effects only. As described by Markandya and Hunt (2003) and the World Bank (2010), it consists of modelling supply and demand relationships in the fuel market to estimate how demand will change with higher prices. This then allows for the estimation of how reform will result in revenue gains and lost consumer surplus, as well as indicating the size of deadweight loss that has been removed. The results of this method are of limited use as it omits indirect effects and provides very aggregate information.

More complicated models may look in detail at one part of the energy system. Wien Automatic System Planning, for example, is focused on electricity generation, and in particular power generating system expansion planning (International Atomic Energy Agency, 2001). Others are very detailed and look across the whole energy system. MARKAL is an integrated model that optimizes energy supply to minimize production costs (Loulou, Goldstein & Noble, 2004). The structure of MARKAL and its many derivative models takes into account primary energy sources as well as secondary ones, representing every step of the conversion process of various energy forms. The structure of the model can be modified according to the availability of energy sources and processes used in the selected area of study, and a modular approach is usually adopted (Loulou, Goldstein & Noble, 2004). With energy demand and prices being in most cases exogenous, the scenarios simulated lack the dynamic analysis of the market and can omit major events that influence energy markets, generating results that are not always accurate (O'Neill & Desai, 2005; Winebrake & Sakva, 2006)

ADAPTING MODELS TO ACCOUNT FOR POLLUTION IMPACTS

Fossil-fuel combustion emits sulfur dioxide, nitrogen oxides and particulates, which cause significant health impacts and damage structures, agriculture and natural environments. Raising the price of a fuel will cause demand for that fuel to fall, generally reducing pollution. But consumers may also switch to use alternative fuels and, depending on the pollution-intensity of the new fuel, overall levels of pollution may decrease or increase. Pollution impacts may also take place due to fuel quality improvements. In many countries, low domestic prices have decapitalized the refining sector, leading a postponement of fuel quality improvement. Fuel quality and vehicle emission standards go hand-in-hand, so higher fuel pricing can be a prerequisite to the tightening of vehicle emission standards.

Generally speaking, three orders of pollution impacts may need to be considered by a statistical assessment: *local* and *national* (air pollution), *regional* (acid rain) and *global* (GHG emissions).

As summarized by Ellis (2010), factoring carbon dioxide impacts into assessments is relatively easy: models need to be adequately disaggregated to project fuel consumption following reform, including fuel-switching behaviour, and the can then multiply the new projected level of consumption by carbon-emission factors for each fuel. Even if concerns over climate change are low in order of importance to national stakeholders, greenhouse gas savings from fuel subsidy reform can be large, and such estimates may be helpful in raising financial or technical support for reform from international agencies and donors.

As summarized by Markandya & Hunt (2003), it is more difficult to build national and regional pollution impacts into quantitative assessments because of the complexity of modelling how emission changes will be dispersed geographically and how the new pollution levels will affect human health and resources. Assigning monetary value of these impacts is an additional complexity.

Two main approaches are described by these authors: first, the European Commission's *impact pathway* approach, which "identifies the sequence of events linking the emission of a specific pollutant, such as SO2, to a specific impact, such as reductions in crop yields, allowing a value on the environmental costs to be calculated" (Markandya & Hunt, 2003). This is complicated to conduct and estimates are typically developed for one or more sites, on which basis national averages are then inferred, using ranges to indicate uncertainty. Alternatively, a *fixed damage co-efficients* approach estimates a fixed aggregate economic cost per unit of a pollutant "usually derived from the application of the impact-pathway approach in a specific geographical context" (Markandya & Hunt, 2003).

Markandya & Hunt note two broad rules about modelling these kinds of impacts. First, environmental impacts will be directly linked to the elasticity of the fuel product. If demand is inelastic (there is a small change in consumption relative to the change in price), then environmental impacts will probably be small. If demand is elastic, on the other hand, effects are likely to be large and there is a strong case for modelling them. Second, impact pathway analysis using geographical dispersion modelling will not usually be possible, making a fixed damage co-efficient approach more appropriate in many cases.

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