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* Director of the Oil & Middle East Programme
Oxford Institute for Energy Studies
57 Woodstock Road, Oxford OX2 6FA, United Kingdom
Tel: +44 (0)1865 311377 – Fax: +44 (0)1865 310527
Wmail: bassam.fattouh@oxfordenergy.org

** Oxford Institute for Energy Studies
Tel: +44(0)1865 889134 – Fax: +44 (0)1865 310527
Email: laura.elkatiri@oxfordenergy.org.

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Abstract

The policy of maintaining tight control of domestic energy prices has characterized the political and economic environment in most Arab countries, together with many other parts of the world, for decades. The objectives behind such a policy range from overall welfare objectives such as expanding energy access and protecting poor households' incomes; to economic development objectives such as fostering industrial growth and smoothing domestic consumption; and to political considerations, including the distribution of oil and natural gas rents in resource-rich countries. While energy subsidies may be seen as achieving some of a country's objectives, this paper argues they are a costly and inefficient way of doing so. Energy subsidies distort price signals, with serious implications on efficiency and the optimal allocation of resources. Energy subsidies also tend to be regressive, with high-income households and industries benefiting proportionately most from low energy prices. However, despite such adverse effects, energy subsidies constitute an important social safety net for the poor in many parts of the Arab world, and any attempts to reduce or eliminate them in the absence of compensatory programmes would lead to a decline in households' welfare and erode the competitiveness of certain industries. Therefore, a critical factor for successful reforms will be the ability of governments to compensate their populations for the reduction or removal of subsidies through carefully designed mitigation measures that protect the poorest and assist the economy in its long-term adaptation. We argue that a reform of energy pricing mechanisms in the Arab world may be seen as beneficial from more than one perspective, and as offering potential paths for reform. Nevertheless, this paper recognizes that the current political climate in the region will render the reform of domestic energy prices difficult in practice, such that reform may indeed be a medium- to long-term endeavour.

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1. Introduction

The essential role played in economic and social development by the various types of primary fuel and electricity provides many governments with several arguments in favour of subsidizing energy prices and maintaining a tight control of the domestic energy sector. Low energy prices, particularly for electricity and higher quality fuels such as petroleum products, help the lowest income groups gain access to modern forms of energy. Furthermore, they help governments protect the incomes of citizens, especially those in the lowest parts of the income distribution, thus contributing to poverty alleviation. Maintaining control of energy prices could also help offset commodity price fluctuations and smooth consumption against wide price fluctuations in international markets. In many resource-rich countries, low energy prices are used as a tool to distribute state benefits to the population without the need for extensive administrative capabilities and income testing. They are also used to promote industrialization and economic diversification aimed at generating employment opportunities and enhancing an economy's global competitiveness. Finally, controlling energy prices is often considered as an important tool for macroeconomic management, especially in the control of inflation.

The Arab world is no exception when it comes to controlling energy prices.[1] Governments' use of explicit and implicit subsidies on the region's most commonly used forms of energy – crude oil, oil products, natural gas, and electricity – have characterized the domestic energy pricing environment in most Arab countries for decades. The region itself, however, is defined by a remarkable degree of political and economic diversity, reflected in the variety of different types of economies – ranging from some of the world's largest hydrocarbon exporters such as Saudi Arabia and Qatar, to energy importing countries such as Jordan, Lebanon, and Morocco. This range of different political and economic contexts renders the Arab world a region rich in experience, which is worth studying with regard to the effects of energy pricing policies. Despite the challenge this diversity necessarily creates to any research in the field, this paper conveys three main messages that apply to the social and economic implications of low energy prices throughout the Arab world.

Message 1: Energy subsidies are costly to the Arab world in social, economic, and environmental terms

One main message is that despite constituting an important social safety net for the poor and achieving some economic goals such as promoting industrialization, subsidization of energy has many unintended adverse consequences for the Arab world. This suggests that the economic costs

[1] The Arab countries studied in this paper include Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Syria, Tunisia, the United Arab Emirates, and Yemen.

of such subsidies in many cases outweigh their perceived benefits. These costs arise in three main areas:

1. *Economic cost*. Energy subsidies lead to a number of economic inefficiencies that are experienced widely throughout the Arab world. They result in misallocation of resources preventing the country from optimizing the use of its reserves; they incentivize over-usage of energy, leading to exceptionally high consumption growth rates for energy in many parts of the Arab world; they lower incentives for productivity improvements and investments in more energy-efficient technology; they distort pricing signals to customers, leading to energy waste, unwanted inter-fuel substitution effects, and a lack of incentives for investment in alternative energies; and they often result in a disparity between domestic petroleum prices in neighbouring countries, encouraging the smuggling of petroleum products and exacerbating the problem of fuel shortage in many parts of the Arab world.

2. *Social cost*. Of particular significance for the Arab world are the consequences of energy subsidies on social equity and on the critical issue of poverty reduction. Human poverty is still widely spread throughout the Arab world, particularly in parts of the Levant and North Africa. Poverty rates range from 11 per cent in Jordan to 30 per cent in Morocco, 40 per cent in Egypt, and close to 60 per cent in Yemen. Severe implications include insufficient access to food and healthy nutrition, education and basic health services, and also to lack of energy access itself.[2] While energy subsidies constitute an important social safety net for the poor, they are regressive in nature because in many instances richer households tend to capture the bulk of subsidies, skewing the existing income distribution. Furthermore, in many cases, fuel subsidies can remove substantial resources from 'pro-poor' sectors such as health and education, and from social and infrastructure projects that are more beneficial to households in low-income brackets.

3. *Environmental cost*. Energy subsidies also contribute negatively towards the protection of the environment, an issue of particular importance for the climate-sensitive agricultural producers of the Levant and North Africa. Subsidies can lead to higher energy use or reduce the incentive to conserve energy, with potential adverse environmental consequences such as increasing airborne emissions and greenhouse gases. Fuel subsidies can also hinder the development of renewable and clean energy technologies – such as solar and wind – which find it difficult to compete with subsidized fossil fuels.

Message 2: There is growing fiscal pressure for reform

The limited success of several Arab countries in revising their energy pricing policies over the past decade has demonstrated the practical difficulties of implementing energy pricing reform. Price increases, particularly when large and unaccompanied by compensatory measures such as direct cash transfers or improved social safety nets, can rally large-scale popular opposition to

[2] UNDP (2009, 132–3).

governments. At no time has this popular force been so apparent in the Arab world as during 2011, a year in which popular protests and uprisings removed the long-serving presidents of Tunisia, Egypt, and Libya from their posts, in consequence of their peoples' longstanding political and economic grievances. In the coming years, therefore, Arab governments willing to engage in energy pricing reforms will be confronted with increasing pressure to strike a delicate balance between necessary but painful economic reform, and the political and economic expectations of their young populations.

However, the mounting fiscal cost of maintaining their current subsidy systems, felt particularly during the past decade, also confronts many Arab governments. Global oil price rises during the 2000s substantially increased the import bill for Arab oil importing countries, and thus the cost of fuel price subsidies, vis-à-vis ten years previously. The import of natural gas, the only alternative to petroleum products used by most Arab states, has likewise become more expensive, as has the production of domestic reserves of natural gas. The enormous fiscal burden caused by energy subsidies, encountered today by many energy importing countries in the Arab world, implies that the reform of domestic energy prices has increasingly become a necessity rather than a choice. For the region's hydrocarbon exporting countries, the substantial opportunity cost of consuming crude oil, refined products, and natural gas domestically at a fraction of international prices, has similarly led to calls for a more efficient use of depletable natural resources.

Message 3: The reform of subsidies will entail serious effects on the poor and must hence be accompanied by focused mitigation measures

The reduction or elimination of domestic subsidies will entail serious economic consequences, particularly for households. The sharp rises in energy prices associated with pricing reform have adverse direct and indirect effects on households' income, with poorer households often suffering a larger decline in incomes. Therefore, a critical success factor for these reforms, as seen from previous examples of countries which have reformed their energy prices, will be the ability of governments to compensate their populations for the reduction or removal of subsidies – through well-targeted energy subsidies towards low income groups, the distribution of direct cash transfers, and/or improving and expanding their existing social safety nets. There are also other options which governments can use to reform their energy pricing frameworks using either fast- or slow-track reforms that eliminate energy subsidies over time. A pivotal factor determining the pace and extent of potential steps towards reform will be both the fiscal and the administrative capabilities of the governments making such reforms. The diversity of the Arab world in this regards suggests that no single reform agenda will fit all countries in the region equally.

The purpose of this paper is to provide an assessment of the use, consequences, and costs of energy subsidies in the Arab world; and to offer options for the reform of energy pricing schemes that address the economic, social, and political concerns associated with steps towards such reform. The paper's primary focus thus rests on the impact of energy subsidy reform on poverty levels, for which reason particular emphasis is placed on the experience of the Levant and North Africa. The paper is divided into four main sections. Section 2 provides an overview of the size of energy

subsidies and current ways of financing them in the Arab world; it attempts to show different ways of financing subsidies in the context of energy producing and energy importing countries, including via explicit and implicit subsidies. Section 3 evaluates the effects of energy subsidies on the region's economies, by assessing their overall benefit in the region against their various social, economic, and environmental costs. A general analysis of the Arab world is given, followed by a case study of Egypt. Section 4 proposes ways of reforming energy subsidies in the Arab world, and briefly discusses recent regional experience with fuel subsidy reform in the case of Jordan. Section 5 offers some conclusions.

2. Energy Subsidies: A Basic Overview

This section provides an overview of the use of energy subsidies in the Arab world. It begins by offering a basic definition of subsidies, including a brief review of differences in definitions between different international organizations. Second, it discusses the rationale behind subsidizing energy from governments' perspective, including important objectives such as poverty alleviation and macroeconomic stability. Third, it looks at different ways of financing subsidies. Fourth, it summarizes the various fuel price adjustment mechanisms used in the Arab world. Finally it discusses energy subsidies in terms of their prevalence within the Arab world.

2.1. Defining Subsidies

The concept of subsidy is often described as 'too elusive' to define.[3] This is reflected in the various definitions used in the literature. At the very general level, a subsidy can be defined as '*any government assistance, in cash or in kind, to private sector producers or consumers for which the government receives no equivalent compensation in return, but conditions the assistance on a particular performance by the recipient*'.[4] It is clear from this definition that many governments' actions can be categorized as involving assistance, including cash subsidies, credit subsidies, tax subsidies, procurement subsidies, and in-kind subsidies.

De Moor and Calamai provide a more narrow definition of subsidy as '*any measure that keeps prices for consumers below the market level or keeps prices for producers above the market level or that reduces costs for consumers and producers by giving direct or indirect support*'.[5] This definition underlies the price-gap approach, which remains the most commonly used method for calculating subsidies due to its simplicity. The price-gap approach compares the observed price for a good or a service against a certain benchmark or reference price. A joint report by IEA/OPEC/OECD/World Bank for the 2010 G-20 Summit in Toronto notes the existence of a major disagreement among international organizations concerning the choice of the reference price, and consequently 'a commonly agreed definition of subsidies has proven a major challenge in the G-20 context and countries have decided to adopt their own definition of energy subsidies'.[6] Specifically, international organizations such as the IEA and the World Bank estimate the size of the subsidy based on the differential between prices of fuels in international markets, and the price at which these fuels are sold domestically. On the other hand, 'OPEC is of the opinion that the

[3] Clements et al. (1995)
[4] US Congress Joint Economic Committee, 1972; cited in Clements et al. (1995, 1-2).
[5] De Moor and Calamari (1977, 1).
[6] IEA, OPEC, OECD and World Bank (2010, 8).

benchmark price to be used in the case of energy resource well-endowed countries should be the cost of production'.[7] Some consider that measures based on production cost are consistent with the definition used by the World Trade Organization (WTO). Under the Agreement on Subsidies and Countervailing Measures, the following conditions must be satisfied for a subsidy to exist: '(i) a financial contribution (ii) by a government or any public body within the territory of a Member (iii) which confers a benefit'.[8] Based on this definition, some analysts argue that as long as the price charged to consumers is not below production costs, then it is difficult 'to justify that a benefit had been conferred to domestic producers'.[9]

In standard economic theory, the most appropriate benchmark with which to compare domestic prices is the *marginal cost* which refers to the increment in total cost that results from a unit change in output. Economic analysis emphasizes the merits of pricing policies that allow prices to reflect the economic cost of providing a good or service, as these maximize economic efficiency and result in the optimal allocation of resources. Measures of marginal cost, however, are difficult to observe in practice. Thus, the focus is instead on the concept of opportunity cost. The opportunity cost is not related to production costs; instead, it measures the forgone value of the resource when that resource is not utilized in its best alternative use, e.g. its value in international markets in the case of internationally traded goods. 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 oil/petroleum products prices in international markets are good approximations of the opportunity cost.[10] For natural gas, the issues are more complex, especially in the context of energy exporting countries. First, unlike crude oil, there is no reliable international benchmark for gas prices. Second, in some exporting countries, much of the gas produced is in association with crude oil and Natural Gas Liquids (NGLs). Given that crude oil is the most sought-after item, until recently many governments treated natural gas as a (free) by-product. Consequently, one could argue that the cost allocated to gas production should be set to zero, or at most to the cost involved in the construction and operation of the infrastructure needed to capture, treat, and distribute the associated gas. Issues such as the production of joint products (but also the availability of spare capacity in some oil exporting countries such as Saudi Arabia, Kuwait, and the UAE)[11] and their implications on measuring subsidies have been recognized by the recent IEA/OPEC/OECD/World Bank joint report, which notes that 'the price-gap method has limitations which apply particularly in the case of countries with large endowments of energy resources'.[12]

Keeping these caveats in mind, this paper uses the IEA's most recent estimates for energy subsidies, based on a price-gap approach that compares domestic prices to international shadow

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7 *Ibid*.

8 The Agreement on Subsidies and Countervailing Measures ('SCM Agreement'), WTO Website, downloaded from: www.wto.org/english/tratop_e/scm_e/subs_e.htm.

9 Dargin, J (2010).

10 Coady et al. (2006).

11 Fattouh (2011).

12 Koplow outlines some other limitations of the price-gap approach, including the fact that global prices themselves may be affected by subsidies or other distortions; adjustments to border prices can be challenging; and use of net-of-tax values for internal prices may not always be appropriate. See Koplow (2009).

prices.[13] Given that this paper's main focus is on internationally traded fuels, comparing domestic prices with those in international markets is the most obvious choice. For completeness, however, the authors also use official government statistics for the case studies of Egypt and Jordan. It is important to note that official calculations may differ substantially from measures used by the IEA, World Bank or the IMF due to differences in the underlying methodology. The government of Egypt, for instance, calculates its subsidy based on the losses incurred by national oil and gas companies when selling petroleum products below their cost (i.e. the financial cost only).[14]

2.2. The Rationale for Energy Subsidies

Domestic energy pricing policies can serve multiple objectives which may often stand in conflict with each other, making it very difficult to evaluate the overall effectiveness of subsidy programmes. These objectives include the extension of social welfare, fostering economic development, as well as political considerations. In this section, the authors of this paper focus on the most common objectives behind the introduction of energy subsidies in the Arab world.

Expanding Access to Energy

Expanding energy access has been one of the key objectives for governments around the world when subsidizing various types of energy. Energy poverty, defined as the lack of household access to electricity or modern forms of fuel for cooking and heating, remains a key challenge in many parts of the developing world, including the Arab world.[15] According to the UNEP, an estimated 1.6 billion people have no access to electricity, while more than two billion people are still reliant on traditional fuels such as wood and charcoal for cooking and heating.[16] In the Arab world, figures from 2002 suggest that some 65 million people in the Arab world had no access to electricity, and an additional 60 million were severely undersupplied, both in urban and rural areas. While the region can reflect on some important achievements in terms of electrification rates, these rates vary considerably – between 100 per cent in some countries such as Kuwait, to 7.7 per cent in Comoros, Djibouti, Mauritania, and Somalia. In terms of cooking and heating, almost a fifth of the Arab population relies on non-commercial fuels like wood, dung, and agricultural residues, particularly in Comoros, Djibouti, Sudan, Yemen, and Somalia but also in Algeria, Egypt, Morocco, and Syria.[17]

It is widely recognized that the lack of access to modern forms of energy, such as petroleum products and electricity, inhibits economic and social development and increases poverty. Thus,

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13 A full account of the IEA's calculation methodology of energy subsidies can be found on its website at www.iea.org/weo/methodology_sub.asp.
IEA data is not immune to shortcomings; most immediately, one concern by the authors is the absence of data for particular types of fuel. Where the IEA lacks official data for fuel types, their rate of subsidisation equals zero despite sizeable subsidies that would technically fall under the definition of subsidies used by the IEA.

14 These issues will be discussed in more detail in Section 3.2.

15 For the case of Yemen, see El-Katiri and Fattouh (2011).

16 UNEP (2008).

17 United Nations Economic and Social Commission for Western Asia (ESCWA)/ League of Arab States (2005).

transitioning to clean and modern fuels constitutes a key objective for many developing countries. Furthermore, improved access to energy services has become one of the underlying conditions for achieving the Millennium Development Goals (MDGs). Since household income levels are seen as one main determinant of energy access,[18] energy subsidies are often expected to facilitate energy access, both to basic fuels such as kerosene – widely deemed to be the fuel of the poor – as well as to higher quality fuels such as LPG, and electricity, by reducing the cost of the fuel. Subsidies may also be used to help the expansion of necessary infrastructure such as electricity grids into rural areas, through direct producer subsidies that incentivize investment in new infrastructure, or through consumer subsidies that decrease the costs of initial household connections to grids.

Protecting the Poor

Protecting households with low incomes from high fuel costs is considered to be one of the key factors behind subsidies.[19] This objective can be pursued in a variety of ways: governments may target those fuels, most typically kerosene, that are widely used directly by the poor; alternatively, governments could try to target the poor indirectly, for instance by diesel subsidies – diesel being widely used in the public transport sector considered as the main mode of transport for low income households, and diesel is also widely used by farmers in rural areas. Other countries provide subsidies to producers, on the ground that subsidies reduce production costs and these producers will then pass these lower costs on to end users by offering cheaper consumer goods. Rather than targeting the poor directly, some governments tend to keep all petroleum products below international prices, regardless of whether these fuels are used by the poor or the rich.

Fostering Industrial Development

Subsidized petroleum products can also be provided to producers such as power stations, manufacturers, energy-intensive industries, financial institutions, and other commercial firms. Energy-intensive industries – such as cement, fertilizers, and petrochemicals – are likely to benefit the most from such subsidies, as energy constitutes an important component of their intermediate cost. The rationale behind such subsidies is to induce firms to provide their goods and services to consumers at affordable prices; to help protect local industries against foreign competition; to enhance their export competitiveness; and to protect local employment. From a broader perspective, subsidizing the industrial sector can, by promoting and protecting a national advantage, be part of a country's industrial and economic development planning. This factor is of particular importance to the Arab world's oil and gas producers, who often use their domestic energy resources to develop more diversified, value-added industries such as fertilizer and petrochemicals production centres.

Consumption Smoothing

Governments can also offset temporary commodity price fluctuations by controlling energy prices, and there are good reasons for doing so: consumers and producers may incur costs in adjusting their consumption and production in the face of volatile energy prices. Smoothing the effects

[18] e.g. Gupta and Sudarshan (2009)
[19] Alderman (2002).

on consumption can economize on these adjustment costs.[20] For example, it may be possible for households and the private sector to smooth such a budgetary shock by resorting to capital markets or by taking self insurance through increasing precautionary savings, which can be drawn on when energy prices are high and paid into when energy prices are low. Alternatively, the private sector can engage in hedging activity. However, these tools for consumption smoothing may not be available to households or the private sector. For instance, consumers and producers may not have access to credit markets. Furthermore, although the market for energy commodities derivatives is well developed, the private sector in developing countries usually does not have access to such instruments.[21] Given these market failures, there may be an argument in favour of a role for government intervention.[22] Subsidizing domestic prices when prices in international markets are high, and increasing taxes when prices in international markets are low, can smooth consumption in the face of highly volatile energy prices.

Avoiding Inflationary Pressures

One of the main worries facing many governments in the Arab world is that international increases in prices of key commodities such as energy and food induce inflationary pressures. Energy is an important component of the consumer basket, and any increase in the price of energy is automatically reflected in an increase in the consumer price index (CPI). It is also argued that high fuel prices cause an upward shift in the cost structure of industries, which is then passed on to consumers.[23] If nominal wages respond to increases in living costs, then higher energy prices can stimulate inflationary expectations and second round inflationary effects, which can pose serious concerns, especially if the government already faces inflationary pressures.

Political Considerations

Fuel subsidies are often very popular and they can therefore be introduced or increased, as appropriate, to alleviate popular discontent. Among the large Arab oil and gas producers in particular, the policy of supplying low-priced energy to the domestic market can also be a measure of distributing oil and gas rents. For example, many Arab Gulf exporters have engaged in providing their citizens with plentiful supplies of cheap energy for decades, as a cornerstone of their citizens' participation in the natural resource wealth of their country. Contingent on the comparative advantage in production costs of energy resources in these countries, many citizens in oil and gas producing countries consider low-priced energy as a guaranteed birthright.

Energy subsidies are often entrenched in institutional barriers and lock-in mechanisms, which makes it difficult to abolish them. This is because subsidies, by definition, entail creation of rents for certain industries, regions, or group of people. Since these rents accrue disproportionately to certain groups (industrialists or particular classes of consumers) while the costs are widely spread,

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20 Federico et al. (2001).

21 It is important to stress that the obstacles that prevent the private sector from engaging in these activities also apply to many governments in developing countries.

22 Federico et al. (2001).

23 Hope and Singh (1995).

the prime beneficiaries of the rents will always have an interest in defending the continuation of the programmes, because the benefits exceed the costs to them. These groups will also have the greatest incentive and capability to organize effective political action, leading to what is known as political mobilization bias, where the government would respond to the interests of small but homogenous groups rather than to some vague wide general interest.[24]

2.3. Financing Energy Subsidies in the Arab World

The financing energy of subsidies takes different forms, depending on a wide range of factors such as whether the country is a net exporter or a net importer of the petroleum product; the organization of the energy sector; the ownership structure of energy assets; the distribution network of gas and petroleum products; and the health of government finances. In this paper, an important distinction is made between net energy importing countries on the one hand, and net energy exporters on the other (see Table 1). Arab energy net exporters include high income countries such as Saudi Arabia, Kuwait, and the UAE; but also mid- and lower income economies such as Algeria, Egypt, Iraq, and Yemen, which face substantial poverty levels, but which have different options relating to the pricing of domestically consumed energy than those confronting net-importers (see discussion below). It should also be noted that very few energy exporters are net exporters across the board. Egypt and Yemen, for instance, are net importers of crude oil (Egypt) and refined products (Yemen), while several of the Gulf states, notably the UAE and Kuwait, are net importers of natural gas. The table below also ignores traded electricity, on which several Arab economies increasingly rely.[25] It is hence possible to find different ways of financing subsidies in one and the same country, including the parallel use of explicit and implicit subsidies in countries both exporting and importing different types of energy.

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24 UNEP/IEA (2001).

25 Consistent numbers for trade in electricity are unavailable for a number of Arab countries; Net importers are Morocco, Syria, Lebanon, and Jordan; Levantine imports of Egyptian electricity rose sharply in 2011 due to shut-downs in gas-fired power plants in Syria, Jordan, and Lebanon following interruptions in Egyptian pipeline gas supplies earlier in the year. The GCC countries, with the exception of Oman, started exchanging small amounts of spinning reserve through the GCC Interconnection Grid, launched in 2009. None of these exchanges has been operating on commercial trading terms. See Darbouche and Fattouh (2011); El-Katiri, L. (2011); Gulf Oil & Gas (2011).

TABLE 1: ARAB ENERGY IMPORTERS AND PRODUCERS AND THEIR NET ENERGY BALANCES, 2009 AND 2010

	Country	Oil Production (1000 b/d), 2010	Oil Consumption (1000 b/d), 2010	Net Oil Balance (1000 b/d), 2010	Natural Gas Production (Bcm), 2009	Natural Gas Consumption (Bcm), 2009	Net Natural Gas Balance (Bcm), 2009
Net Energy Importing Countries	Jordan	0.09	98	–97.91	0.25	3.1	–2.85
	Lebanon	0	106	–106.00	0	0.04	–0.04
	Morocco	3.94	209	–205.06	0.06	0.56	–0.50
	Tunisia	83.72	84	–0.28	3.6	4.85	–1.25
	West Bank	0	24	–24.00	0	0	0
Small Energy Exporting Countries*	Bahrain	46.43	47	–0.57	12.58	12.58	0
	Egypt	662.62	740	–77.38	62.69	44.37	18.32
	Oman	867.88	142	725.88	24.77	14.72	10.04
	Syria	401	292	109	6.19	7.1	–0.91
	Yemen	258.75	157	101.75	0.52	0.1	0.42
Large Energy Exporting Countries	Algeria	2077.74	312	1765.74	81.43	28.76	52.67
	Iraq	2408.47	694	1714.47	1.15	1.15	0
	Kuwait	2450.37	354	2096.37	11.19	12.08	–0.89
	Libya	1789.16	289	1500.16	15.9	6.01	9.89
	Qatar	1437.22	166	1271.22	89.29	21.1	68.19
	Saudi Arabia	10521.09	2643	7878.09	78.45	78.45	0
	UAE[26]	2812.84	545	2267.84	59.06	59.06	0

Source: Authors; EIA; Cedigaz

* Less than 1 million b/d of oil equivalent

Financing Energy Subsidies in Energy Importing Countries

Energy importers face the standard range of options for financing subsidies. Energy subsidies can be on-budget or off-budget. On-budget subsidies constitute explicit cash transfers made by the government to either the producer or the consumer receiving the subsidy, registered on the state's budget (these are also referred to as *explicit subsidies*). For instance, a government may mandate that a public utility sets the selling price below the cost of production. The government then finances the public utility's losses by transferring funds from the budget.[27] For net energy importers, these funds can be secured by cutting government expenditure in other areas, increasing direct or indirect taxes, and/or by borrowing in local or international markets. Alternatively, a net importer may decide to finance the subsidy programme through off-budget activities. Off-budget subsidies are less transparent and more difficult to calculate. In terms of public finances, their

[26] The UAE became a net importer of natural gas in 2008; Owing to some gas exports having been under long-term contracts, the data presented in this table does not reflect this gap.

[27] In many countries' budget records, this concept underlies their measure of subsidies in the economy, e.g. in the case of Egypt.

impact is similar to on-budget subsidies: off-budget subsidies will have to be paid for, and thus will eventually be translated into, higher government deficits which need to be financed. Thus, financing off-budget subsidies is considered as a quasi-fiscal activity which eventually creates a quasi-fiscal deficit. A common feature of all types of energy subsidies in energy importing countries is that their size is typically beyond governmental control.

Energy subsidies can also be cross financed between different energy user groups. Cross subsidies occur when tariffs below the cost of production are charged, for instance, to household users, and the revenue shortfall is offset by increasing industrial/commercial sector tariffs to above-cost levels. Other types of cross subsidies are found in uniform national pricing systems, when a single tariff structure is applied to consumers whatever their location (urban, rural, etc.) or when utility companies raise tariffs to recover lost revenues from non-paying customers.

Financing Energy Subsidies in Energy Exporting Countries

The government of an energy exporting country is faced with different choices. The standard argument used by producers of crude oil and natural gas is that their energy resource wealth and the low cost of domestic production justify low domestic energy prices to a certain extent. Low-cost energy enjoyed by consumers in the Arab world's hydrocarbon producing countries is hence often not considered by these countries as subsidized energy, owing to the fact that no *explicit* government transfer is made. For instance, the national oil company can be mandated to sell petroleum products for the domestic market at below international prices but above production costs. In this case, the national oil company does not incur financial losses, and hence the government does not need to make an explicit transfer to compensate the national oil company for losses. Nevertheless, low pricing of fuels involves an *implicit subsidy* or an *implicit transfer*. The implicit subsidy represents the economic rent/revenue wasted by failing to sell oil at higher market prices; it involves a transfer from the government to the final consumers without such a transfer appearing explicitly on state oil companies' records or in the government budget. If this foregone revenue had been collected, it could have been used by the government in a variety of ways – for instance to reduce the budget deficit and the size of the public debt; to increase spending in more productive areas such as infrastructure, education, and health; to distribute it directly to its people; or to reduce, where applicable, taxation.[28] Because losses in foregone revenues on government records are implicit, they are difficult for governments to convey to the public as real losses or costs. The lack of transparency about the size of implicit transfers, their direct and indirect costs, and the identities of the main beneficiaries, makes it difficult for governments to initiate energy pricing reform.

2.4. Adjusting Fuel Prices

In the Arab world, so far only Jordan, Lebanon, Tunisia, and Morocco operate variations of rules-based, automated fuel price adjustment mechanisms which pass through increases in the price of

[28] Gupta et al. (2003).

imported fuels on international markets to the domestic economy.[29] As shown in , the international pass-through to domestic fuel prices in the Middle East has been the lowest in the world. In the absence of fuel price adjustment mechanisms, regulated prices necessarily lead to a fluctuation in explicit and implicit energy subsidies following price movements for fuels in international markets. The results may be transparent or non-transparent in government budgets, but the consequences for the economy are not invisible, as will be further discussed in Section 3.

TABLE 2: INTERNATIONAL PASS-THROUGH OF INTERNATIONAL FUEL PRICE RISES, 2006–7

	Gasoline		Kerosene	Diesel
	2006	**2007[1]**	**2007[1]**	**2007[1]**
Net oil importers (median)	1.83	1.03	0.90	1.05
Net oil exporters (median)	0.59	0.53	0.22	0.53
Whole sample (median)	1.72	0.90	0.85	1.01
Africa (median)	1.67	1.06	1.09	1.36
Asia (median)	2.15	1.36	0.65	0.94
Europe (median)	1.75	1.30	-	1.61
Middle East (median)	0.78	0.58	0.34	0.67
Western Hemisphere (median)	1.09	0.70	1.15	0.69
Memo items:				
Countries in sample	42	42	24	37
Countries with full pass-through[2]	31	18	11	17
Within-year pass-through[3]	1.27	0.41	0.63	0.48
Countries with full within-year pass-through[2]	26	8	5	9
International fuel price increase (per cent)[3]	6.9	48.1	44.2	47.2

Source: Mati (2008)

Notes to Table:
Unless otherwise indicated, 2003 is used as the reference year for all pass-through calculations
[1] Post-tax retail prices; latest observation for 2007
[2] Pass-through is defined as 'full' when it is greater than or equal to 1
[3] Calculated using the end of the previous year as the reference point.

Table 3 presents the fuel price adjustment mechanisms used in various parts of the Arab world and the major recent changes in domestic fuel prices in each of the countries. As seen from this table, there is wide variation among Arab countries with many countries, mainly the net exporters, adopting an ad hoc approach to revising fuel prices. The table also shows that despite announcements of plans to reform fuel prices in many countries, little progress has been made, which reveals the political difficulties involved in increasing energy prices and liberalizing this strategic sector. These issues are discussed in more details in Section 4.

[29] In all four cases, the political uprisings in early 2011 impacted the effectiveness of these mechanisms via at least temporary reductions in their pass-through rates; See discussion further below.

TABLE 3: FUEL PRICE ADJUSTMENT MECHANISMS AND RECENT CHANGES TO PRICING STRATEGIES IN ARAB COUNTRIES

	Country	Retail Fuel Price Mechanism	Recent Changes to Domestic Fuel Prices
Net Energy Importing Countries	Jordan	*automatic*	Increased fuel prices in 2005 and 2008, following which most prices reflected international prices. A committee formed of representatives from the Ministries of Finance, Energy, and Trade, and from the Jordanian Petroleum Refinery Company adjusts the prices of petroleum products monthly, based on a formula that follows the changes in the price of Brent crude oil during the previous 30 days.[30] In January 2011 Jordan temporarily suspended its automated adjustment mechanism, owing to increased social and political pressure, and reduced prices and taxes on fuel.[31]
	Lebanon	*automatic*	Fuel price subsidies were de facto eliminated in October 2008 with the reintroduction of fuel excise taxes; final fuel prices are issued weekly via ministerial decree basing the price on cost (including distribution costs and station margins) plus fuel excise taxes.[32] In early 2011, the Lebanese government reduced fuel excise taxes in response to high world market prices and increasing domestic political tensions.[33]
	Morocco	*automatic*	After ad hoc fuel price rises in 1999 and 2005, Morocco increased domestic prices in 2006 for all products, except butane/LPG, to reflect import prices at the time, and introduced an automated, index-linked adjustment mechanism that would adjust prices in proportion to international price variations exceeding 2%.[34] Rising costs of newly built-up fuel subsidies caused the country in 2011 to contemplate a move from universal subsidies to targeted transfers in the future.[35]
	Tunisia	*automatic*	After ad hoc fuel price rises in 2005 and 2007, the government decided in January 2009 to cap the subsidies at the level they reached when oil cost $52 per barrel. Whenever the international price of oil exceeded the reference price of $52 per barrel by $10 over a period of three consecutive months, prices of petroleum products increase by an a priori fixed amount. In early 2010 the reference price was raised to $60 per barrel.[36]
Small Energy Exporting Countries *	Bahrain	*ad hoc*	
	Egypt	*ad hoc*	Egypt has been discussing the phasing-out of fuel and electricity subsidies to private consumers and industry for years. The new government, in the most recent statements, said it was studying the possibility of subsidy phase-out, after announcing in May 2011 that no rises to electricity prices were planned for the coming fiscal year.[37]
	Oman	*ad hoc*	
	Syria	*ad hoc*	Initially began a reform of fuel prices in 2008, after which original plans were to raise fuel prices every three months until they reached international prices, owing to the large fiscal burden of fuel subsidies. First fuel price increases were coupled to public sector wage rises and rationed sales of diesel at lower prices to households.[38] Initial plans in early 2011 had been to follow a similar strategy to Jordan, by phasing out fuel subsidies completely, coupled to mitigation measures such as wage increases and new pension schemes. The eruption of political protests in March 2011 halted these plans.[39]
	Yemen	*ad hoc*	Fuel price rises in 2005 resulted in large-scale rioting and several dozen dead protesters.[40]

Large Energy Exporting Countries	Algeria	*ad hoc*	Last fuel price rises in 1995 and 2000, followed by Energy Minister Chekib Khelil remarking in 2003 that energy subsidies should be phased out 'earlier or late'. A draft at the time of the country's Hydrocarbon Law (later dropped by Parliament) supposedly contained a framework and schedule for the progressive removal of subsidies for gas prices over a 10-year period, and for petroleum products over a five-year period.[41] Most recent remarks were made in 2008 in the context of Algeria's WTO membership application, at which time Khelil denied the existence of subsidies on natural gas in Algeria.[42]
	Iraq	*ad hoc*	
	Libya	*ad hoc*	
	Kuwait	*ad hoc*	Last changes to petroleum product prices in 1999, partly in response to rising domestic consumption of refined products.[43]
	Qatar	*ad hoc*	
	Saudi Arabia	*ad hoc*	
	UAE	*ad hoc*	Most recent product price revisions 2001, 2004, 2005, and 2007, in response to losses made by distributors as a result of higher crude oil prices.[44] Distributors proposed in 2001 introduction of an automated fuel price adjustment mechanism for retail prices, but the proposal failed to gain political support.[45]

Source: Authors; MEES; Ragab (2010), Various newspapers.

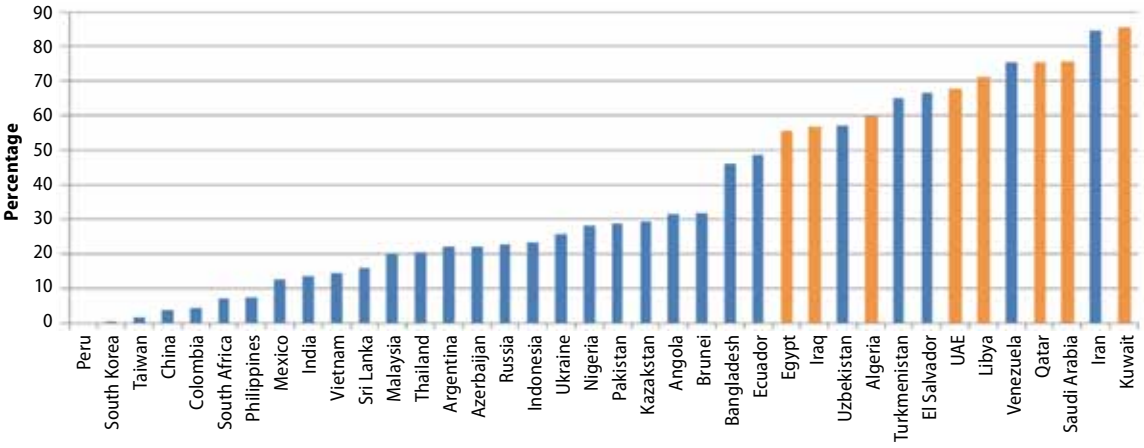
* Less than 1 million b/d of oil equivalent

30 Ragab (2010, 3).
31 IMF (2011b, 47).
32 IMF Prices are published weekly at the Ministry of Energy and Water's website at www.energyandwater.gov.lb/pages.asp?Page_ID=44.
33 Blominvest Bank (2011); Now Lebanon (2011); Daily Star (2011).
34 MEES (2006).
35 IMF (2011a, 9).
36 Ragab (2010, 3).
37 Daily News Egypt (2011).
38 IMF (2010a, 10); MEES (2008); MEES (2011a).
39 MEES (2011a).
40 Guardian (2005).
41 MEES (2003).
42 Reuters (2008).
43 MEES (1999).
44 MEES (2001); MEES (2007).
45 MEES (2001).

2.5. The Prevalence of Energy Subsidies in the Arab World

Energy subsidies, both explicit and implicit, are widespread in the Arab world. In the absence of consistent data from Arab countries, this paper relies on IEA estimates, which base the measure of national subsidization rates on a price-gap approach comparing domestic prices for oil, oil products, and natural gas with international shadow prices. According to IEA measures, Arab countries are among the largest subsidizers of energy in the world (see Figure 1). Six of the world's ten largest subsidizers are found in the Arab world, led by Kuwait, Saudi Arabia, and Qatar. Each of these three countries charges their populations less than a third of international prices for fuel and electricity.

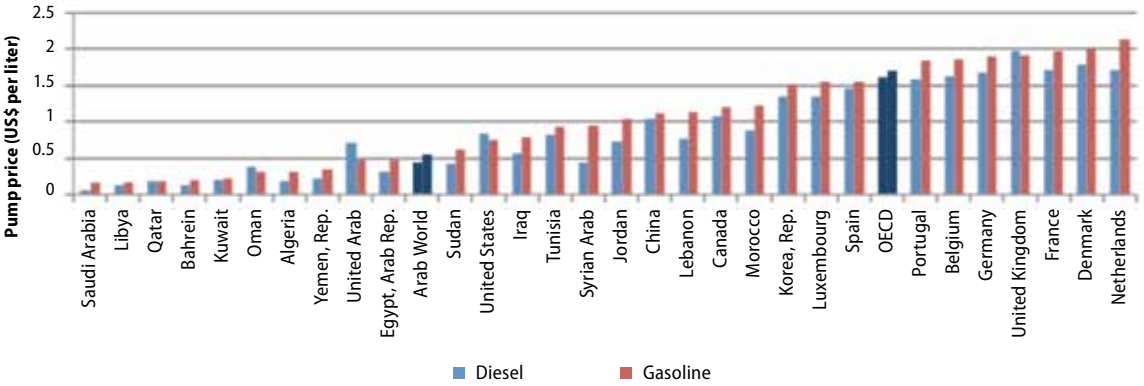
FIGURE 1: AVERAGE SUBSIDIZATION RATES FOR DOMESTIC FUELS IN SELECTED COUNTRIES (IN %), 2010



Source: IEA

The effect of subsidies on Arab fuel prices can be illustrated by a cross-country comparison of average retail prices for gasoline and diesel (see Figure 2). Prices for fuel in the sample are lowest in the Arab Gulf countries, with considerable variance between gasoline and diesel prices in some of the Mashreq countries (Syria, Jordan, and Lebanon) and North Africa (Tunisia, Morocco). If compared with a most basic indicator of cost (an average world crude oil price of 30 US cents/litre in 2010) it is clear that most Arab oil producers charge domestic users below the opportunity cost price of crude oil sold on international markets – a substantial loss in terms of foregone export revenue. In addition, Egypt and Yemen are both net importers of oil products, implying that their expenditure on fuel subsidies must be explicit in the case of all imported fuel – they incur actual fiscal losses from buying at full international prices and selling domestically at discounted prices.

FIGURE 2: AVERAGE RETAIL PRICES FOR GASOLINE AND DIESEL IN SELECTED ARAB, OECD AND NON-OECD COUNTRIES (IN US$/LITRE), 2010



Source: World Bank.

3. Evaluating Energy Subsidies in the Arab World

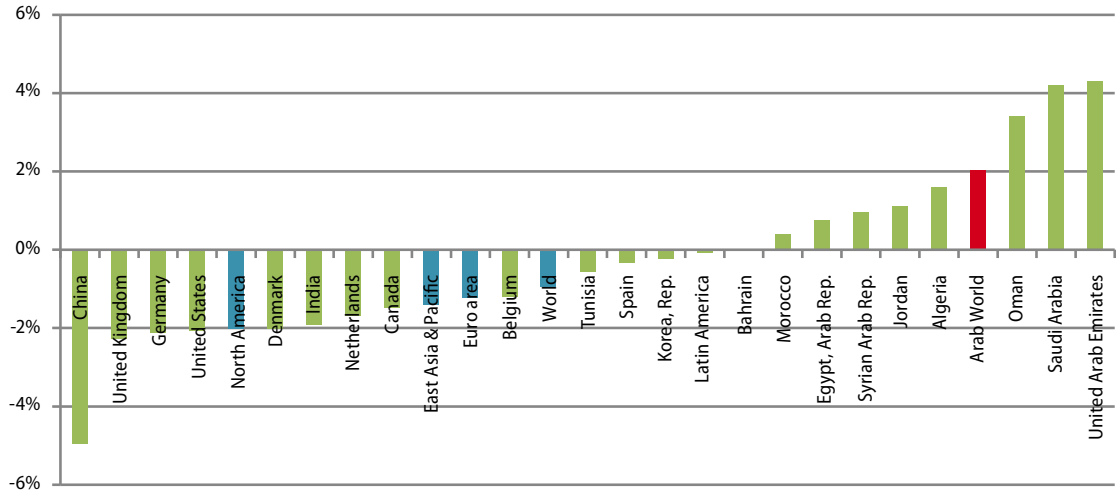
The Arab world comprises a number of very different economies, with varying objectives and practices of energy subsidy systems. Both explicit and implicit subsidies have nevertheless resulted in a number of unintended consequences that are shared across the region. A key message conveyed by the following evaluation is that while energy subsidies may partially achieve some of their intended objectives, they are costly to the Arab world in numerous ways. Energy subsidies distort price signals and create inefficiencies with serious implications on the allocation of scarce resources. They protect consumers from the need to adapt their consumption patterns to the rising cost of energy, and from investing in more energy-efficient technology, leading to over-consumption and waste of subsidized energy by industries and households. Energy subsidies also tend to be socially regressive, with high income households and industries benefiting proportionately most from low energy prices. In many cases, energy subsidies have proven ineffective in securing macroeconomic stability. Finally, they carry important fiscal consequences, by contributing to increasingly unsustainable budget deficits.

3.1. Unintended Consequences of Energy Subsidies

Efficiency

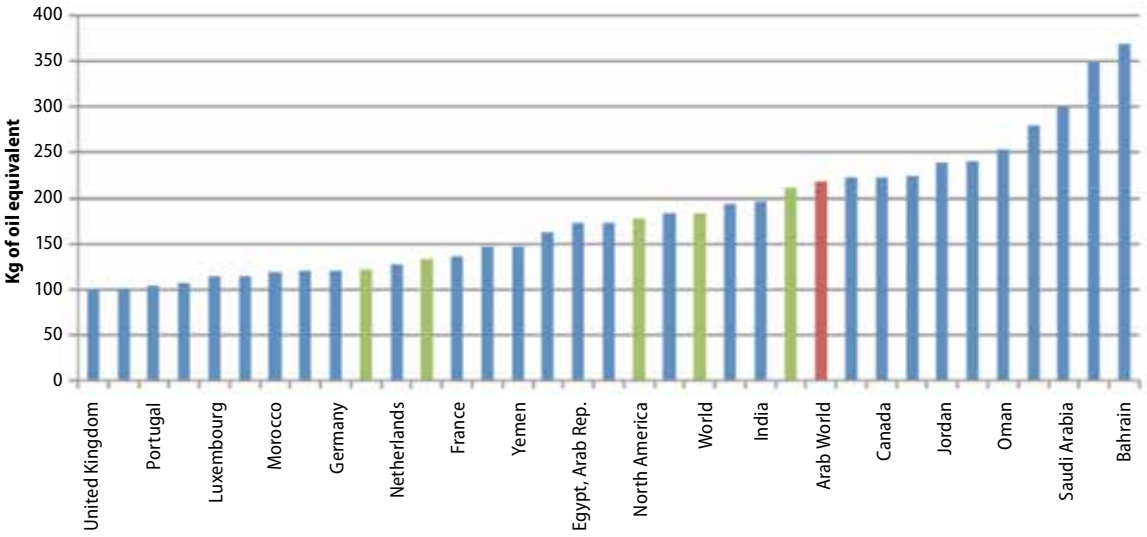
A rise in the energy intensity of GDP and low energy efficiency rates. The Arab world is among the most energy-intensive regional economies in the world, and the trend is towards an even greater rise in energy intensity. As Figure 3 below shows, total primary energy consumption per dollar of GDP (an indicator of energy intensity) over the past three decades has declined in all parts of the world, with the exception of the Arab world. Energy intensity growth rates in several Arab economies, including the UAE, Saudi Arabia, and Oman have risen particularly fast, and more than tripled in the UAE and Saudi Arabia alone since 1980. This growth is not a Gulf phenomenon alone, however; energy intensity in several other economies, such as Jordan, Egypt, and Syria, still increased by more than a third over the same period of time. In absolute terms, eight out of the world's ten most energy-intensive economies are Arab countries, including Bahrain, Iraq, Saudi Arabia, and Oman (see Figure 4). Even several Mashreq economies such as Egypt and Jordan whose industries are generally less energy-intensive, still require over 40 per cent more energy per unit of economic output than some of the world's less energy-intensive economies such as Denmark or Spain.

FIGURE 3: COMPOUND AVERAGE GROWTH RATE OF ENERGY USE (KG OF OIL EQUIVALENT) PER $1,000 GDP (CONSTANT 2005 PPP) IN SELECTED ARAB, OECD, AND NON-OECD COUNTRIES, 1980–2008



Source: World Bank, World Development Indicators

FIGURE 4: ENERGY USE (KG OF OIL EQUIVALENT) PER $1,000 GDP (CONSTANT 2005 PPP) IN SELECTED ARAB, OECD, AND NON-OECD COUNTRIES, 2008



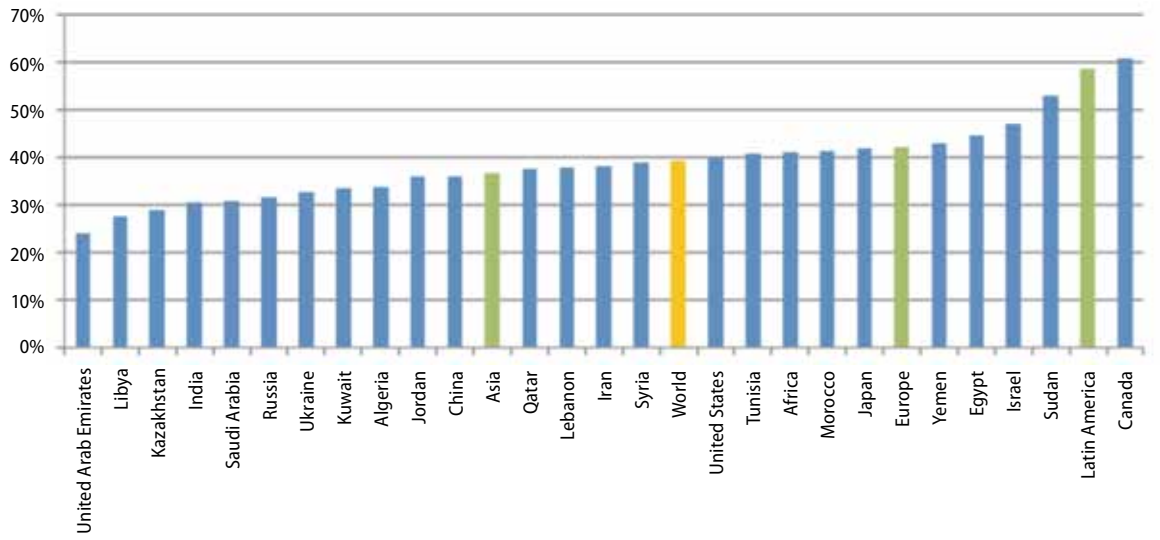
Source: World Bank, World Development Indicators

Low energy pricing, and the concentration of industrial activity on energy-intensive industries in several Gulf states, are two main contributors to the remarkable growth in energy intensity in the Arab economies. The two factors also mutually reinforce each other: a (perceived) abundance in low-cost energy favours the development of energy-intensive industries such as petrochemicals and aluminium production, while their large-scale promotion as sunrise sectors in the economy provides an important, self-perpetuating argument by industry for governments to maintain low

pricing policies as a key factor in their country's competitive advantage. However, subsidized energy also induces large inefficiencies into the way in which energy is consumed. Producer subsidies protect firms from competitive pressure and discourage them from pursuing strategies to minimize energy costs, resulting in inefficiency and loss of competitiveness. They also distort price signals and may result in a misallocation of resources towards investments that would be much less profitable in the absence of subsidies. Losses due to energy inefficiency and the waste of scarce resources are a problem encountered throughout the Arab world, and they affect other industries such as power and water production (the latter being, in several Arab economies, contingent on the desalination of sea water, a chemical process requiring large amounts of electrical power).

As an illustration of this effect, Figure 5 shows the efficiency of power generation for selected Arab countries compared with other parts of the world. Although there has been a modest improvement in efficiency levels over the last two decades, most Arab countries are well below the world's average in terms of efficiency of the power sector. Major Arab energy producers, including the UAE, Libya, and Saudi Arabia, are notably among the least energy efficient countries in the world in terms of domestic power generation. Even net importers such as Jordan, Lebanon, and Syria, however, suffer from low energy efficiency rates in power generation compared with other developing regions, for instance Latin America.[46]

FIGURE 5: ENERGY EFFICIENCY IN POWER GENERATION IN SELECTED ARAB, OECD, AND NON-OECD COUNTRIES (%), 2009



Source: ABB, Trends in Global Energy Efficiency 2011

[46] A World Bank report on Lebanon's electricity sector pre-2008 illustrates this point: 'The continued use of gas-oil (diesel) in two major power plants (as well as in the gas turbines designed as peaking plants but used as base load plants due to insufficient capacity to serve demand) designed to use natural gas (despite the abundance of natural gas in the region), high O&M cost of all power plants due to insufficient regular maintenance and spare parts, as well as high technical losses, result in very high production costs. Subsidies are estimated to have reached 4% of GDP in 2007, and 39% of total government spending between 1997 and 2006'. World Bank (2008, 5).

Similar conclusions apply to the region's rapidly growing transport sector. A report by McKinsey in 2007 found that the fuel efficiency of private and public transport in the Middle East is exceptionally low: average fuel consumption per vehicle is more than double the average that prevails in countries without fuel subsidies.[47] With large fuel subsidies effectively eliminating incentives for private and business transport to economize on the use of fuel (for instance, by choice of vehicle, choice of the number of trips, and choice of public transport), the Arab world wastes large revenue resources on inefficient modes of transport. McKinsey subsequently argues that out of the world's total potential to make energy efficiency savings in the road sector, one third alone arises from the elimination of fuel subsidies in the highly subsidizing economies of the Middle East, and Venezuela.[48]

A rapid growth in consumption of the various primary fuels and electricity. Rising levels of energy intensity also reflect aggregate levels of energy consumption throughout these economies. As shown in Figure 6, during the period 1980 to 2008, total energy and electricity consumption in the Arab world grew fast – more than 5 per cent annually between 1980 and 2008 for total primary energy and more than 7 per cent for electricity – thereby outpacing real GDP and population growth. Total energy consumption in the Arab world more than tripled over this period, while electricity consumption rose over six times in three decades. The Arab world, along with the Middle East as a region, has hence become the second most important energy growth market for energy consumption in the world – according to leading forecasts such as those by the IEA and EIA only Asian demand growth is higher.49 Among the fastest growing countries, both in aggregate and on a per capita basis for primary energy consumption, are oil exporters such as Saudi Arabia and the UAE, but also Yemen, Jordan, and Egypt, all of which have grown at rates above the Arab world's average. For electricity, consumption growth well above the average has been led by Oman, Jordan, the UAE, Yemen, Saudi Arabia, and Qatar. All Arab countries' demand for both primary fuels and electric energy has been far above the world trend, with world consumption growth for energy and electricity respectively being 1.85 per cent and 3.28 per cent compound average per annum between 1980 and 2008. In per capita terms, small GCC monarchies such as Qatar, Kuwait, and the UAE face among the highest energy consumption rates in the world (see Figure 7).

One notable consequence of rising domestic demand in the Arab world has been that several of the region's former, or potential, exporters of oil or natural gas have in the past years turned into net importers. This has been the case in Egypt (for oil and oil products), Yemen (refined products), and the UAE and Kuwait (natural gas) – a paradoxical situation given these countries' own substantial resource endowments.[50] For large oil producers with substantial surpluses of production over and

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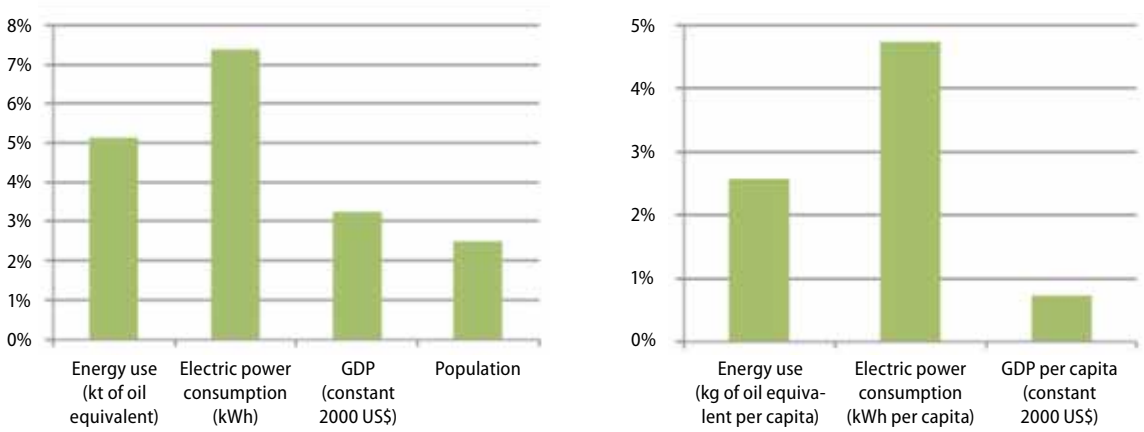
47 Notably, the Middle East region under this context includes Iran, which until 2010 was widely cited as the single largest subsidizer of domestic fuels in the world. Bressand et al. (2007, 15)

48 The 'Middle East' under this definition also includes Iran, at the time one of the world's largest subsidizers of energy prices. Farrell et al. (2008, 21)

49 IEA (2010).

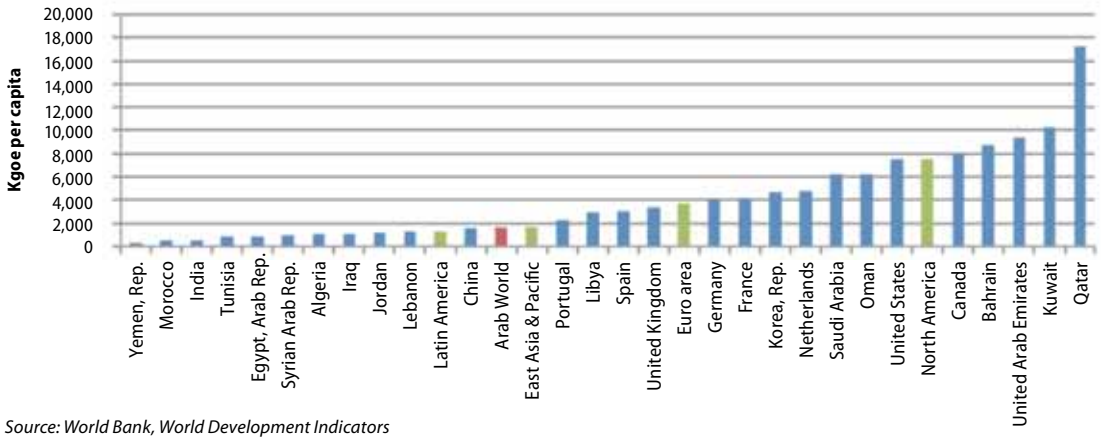
50 Kuwait has never exported natural gas, but has sizeable own reserves, production from which, however, currently falls short of domestic demand. The UAE, likewise, hold substantial own natural gas reserves but their development has been slow, and own production is in parts tied up under long-term export contracts which account for the federation's continued gas exports despite a rapidly growing domestic market in need of greater imports.

FIGURE 6: COMPOUND AVERAGE GROWTH RATE FOR CONSUMPTION OF ENERGY, ELECTRICITY, REAL GDP, AND POPULATION FOR THE ARAB WORLD (AGGREGATE), 1980 – 2008



Source: World Bank, World Development Indicators

FIGURE 7: ENERGY USE IN SELECTED ARAB, OECD, AND NON-OECD COUNTRIES (KG OF OIL EQUIVALENT PER CAPITA), 2008



Source: World Bank, World Development Indicators

above domestic needs, the rapid growth of domestic demand for crude oil furthermore implies the possibility of rapid erosion of their spare capacity. This point is of particular relevance for Saudi Arabia, Kuwait, and the UAE – all large Arab oil producers, and key holders of spare capacity.[51]

[51] Saudi Aramco's CEO Khaled Al-Falih publically expressed his worries in 2010 about the levels of domestically consumed oil in Saudi Arabia. The kingdom currently burns as much as 1mn b/d in summer in power plants, out of a total production of some 8–8.5mn b/d in 2010. Al-Falih expressed worries that by 2028, exports could hence fall by as much as 3mn b/d. Kuwait has faced similar worries. Financial Times (2010); Bloomberg (2010); Financial Times (2011).

Underinvestment in the energy sector where subsidies are poorly implemented. The widespread use of energy subsidies also has consequences on the rate of investment in the energy sector in parts of the Arab world. Caps on government subsidies to be paid to producers, or flat payment subsidies, may often not fully compensate domestic oil/gas producers, refineries, importers and distributors, and electricity producers for their incurred losses, and may undermine the rate of return on their investment. Specifically, by diverting funds away from state-owned enterprises and oil marketing companies and distributors, these companies will not be able to upgrade their internal capabilities, invest in new infrastructure, or shift to modern, cleaner, and more efficient technology.

The result is often the provision of low quality services to end users, most visibly in the region's electricity sectors. Irregular services with recurring power outages have characterized electricity provision throughout wide parts of the Arab world, typically in response to decade-long underinvestment in electricity generation on the one hand, and transmission and distribution networks on the other. In many parts of the Levant and the Arab Gulf, this situation is further exacerbated by a culture of non-payment of utility bills by some parts of the population, typically in response to the popular perception that utilities should be supplied at little or no cost by the state – the result of decades of low-cost utility provision by state-owned utility companies. In Levantine countries such as Lebanon and Jordan, non-payment by some population groups is, in part, also the result of continued electricity theft via illegal grid connections by households unable or unwilling to pay utility bills.[52] In many cases, electricity theft and non-payment by some user groups come in combination with over-charging of other customer groups by electricity companies needing to recover costs. Recurring blackouts and long waiting times for new electricity connections for private households and businesses are often the consequence, resulting in annual losses in foregone business activity and backup costs for the economies concerned.[53]

For some of the poorest parts of the Arab world, however, the consequences of underinvestment and lack of electricity grid access are even more staggering; lack of electrification in remote areas is known primarily in Yemen and in some rural parts of Morocco and Oman. Yemen, the Arab world's most undersupplied country in terms of electricity, faces electrification rates of little more than half the population, the remainder lacking any form of electricity access – with severe consequences for the country's socio-economic development and poverty rates (see 1 for a detailed discussion).[54] Yemen's case is particularly startling given that the country remains a net exporter of energy.

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52 The rate of non-technical electricity losses in Lebanon (essentially losses through illegal household connections) in 2007 for instance stood at 18% of Lebanon's total electricity generation, in addition to a high rate of technical losses of 15%. IMF (2007, 19).

53 The Lebanese electricity sector illustrates this point. Prior to the 2008 electricity sector reform, the situation was described by a World Bank country report in the following way: 'Power outages are a daily occurrence in Lebanon and in some regions of the country the quality of electricity supply is particularly poor. No new power generation capacity has been added since the two combined cycle plants were installed in the 1990s. This has led to a massive investment by consumers and industry in backup arrangements. Indeed, this form of energy security is estimated to cost the population at least an additional 25% in spending on electricity per month. The interruption in supply by the utility, EdL, is furthermore estimated to cost industry close to US$400 million in sales losses'. World Bank (2008, 5).

54 See also El-Katiri and Fattouh (2011).

BOX 1: UNDERINVESTMENT AND ELECTRIFICATION IN YEMEN

Yemen is one of the poorest Arab countries, despite the country's comparable natural resource wealth in the form of oil and natural gas reserves. It is also perhaps the most energy-poor country in the Arab world, particularly in the area of electricity access. Strikingly, a mere 53% of the population has access to electricity, and only 36% of the total population are served through the country's main Public Electricity Company (PEC) grid, the rest being connected to village-based mini-grids or using self-generators run on mostly on diesel or gasoline.[55] This is despite Yemen not being, in principle, short of fuel for power generation: the country is a net exporter of crude oil and gas, though a net importer of petroleum products. Domestic fuels for consumption by households and industries are heavily subsidized, with government figures for electricity subsidies, in the form of fuel subsidies for the state producer and consumer subsidies, amounting to US$1.1 billion in 2008.[56] The share of the government budget taken by total energy subsidies to the economy is high: in 2009, some 22% of total government expenditure was spent on energy subsidies (34% in 2008), exceeding the expenditure on education and defence, and amounting to almost seven times the expenditure on health.[57]

Lack of access to electricity in Yemen is primarily a problem of infrastructure. Both generation capacity in existing power plants, and the country's transmission and distribution (T&D) network are insufficient. Yemen's total installed generating capacity in 2009 stood at 1,551 MW,[58] for a population of 24 million people. Per capita consumption of electricity in Yemen is, at some 203 KWh per capita in 2009, only a tenth of the Arab world's average of some 2,000 KWh.[59] The country's main PEC grid connects mainly urban areas and the cities, and until now has entirely excluded the former South Yemen. Overall, 92% of urban households, but only 42% of rural ones have access to electricity. Of those households not served with electricity, 96% are in rural areas, making the lack of access to electricity an essentially rural problem.[60]

Where there is grid access, both residential and industrial users experience occasional shortages and load shedding. Supply disruptions occur many times during the year as a result of old, inefficient generation and T&D infrastructure, technical failures, and the recurring shortage of fuel, particularly diesel, in power generation plants. This situation is also particularly damaging for businesses and industries, which incur substantial losses from load shedding and recurring power outages. An IFC Enterprise Survey found that in 2010, more than 50 power outages were experienced countrywide, most of which lasted several hours, causing substantial commercial losses for businesses. Many smaller businesses hence make the extra investment in backup diesel-fired generators, which creates additional cost.[61]

The main reason for this situation is long-term lack of investment in Yemen's utility sector – such as in new capacity, maintenance and repair of old T&D infrastructure, and expansion of Yemen's electricity grid towards southern and particularly rural communities. Yemen's public utility PEC is severely under-funded, not least due to Yemen's government-regulated pricing system, which was originally intended to help poor people access electricity. With electricity prices having been held down artificially for years under an extensive electricity subsidy system, PEC has for many years been unable to recover its costs.[62] In consequence, PEC currently has neither the financial nor the physical capacity to make expensive large-scale investments in the extension of its main grid to remote provinces. Electricity theft and the additional problem of non-payment subsequently aggravate the large financial losses to the PEC, which further exacerbates the inability of PEC to extend services or reduce charges to those with an official connection.[63]

55 World Bank (2005a, 89).
56 Assamiee (2010).
57 For a detailed discussion of these data, see El-Katiri and Fattouh (2011); Breisinger et al. (2011).
58 Republic of Yemen, Ministry of Energy and Electricity (2009, 18).
59 Republic of Yemen, Ministry of Energy and Electricity (2009, 19).
60 World Bank (2005a, 89).
61 El-Katiri and Fattouh (2011).
62 See also World Bank (2005a, 94).
63 Assamiee (2010); Shaher (2011).

Fuel Shortages. Price caps, which keep prices below market clearing levels, have also resulted in physical shortages of subsidized petroleum products and of natural gas in the Arab world. This is also the case where some, but not all, fuels are heavily subsidized, for instance in the case of low-priced kerosene, which is often substituted for more expensive diesel (legally or illegally), leading to kerosene shortages, particularly in some rural areas.[64] Rapid increases in demand have led to rationing in refining companies, for instance in the case of petrol and diesel supplies to petrol stations in Jordan in November 2008,[65] and in the Northern Emirates in June 2011.[66] Yemen, on the other hand, has experience chronic fuel shortages for years, with no long-term solution other than the continued import of refined products.[67] In Egypt, the government has had to resort to administrative controls to ration LPG cylinders, a system which is costly, inefficient, and open to abuse.

Distorting effects on economic diversification. Contrary to their initial intent, energy subsidies can distort economic diversification efforts and encourage rent-seeking behaviour. Aissaoui describes this effect in the Saudi Arabian context in the following way:

> '[…], while greatly benefiting the [petrochemical] industry, giving it a distinctive competitive advantage in terms of variable costs, the prevailing [subsidized] pricing system encourages rent-seeking behavior. This might explain private entrepreneurs' reluctance to invest into the more challenging tertiary processing of petrochemicals, or even be attracted to the so-called industrial parks (downstream plastic conversion industries planned *in situ* the refinery–petrochemical complexes), without securing a share of the rent in the form of low-priced feedstock.'[68]

Particularly for the Arab world's large energy producers, a more diversified economic base is essential not only in terms of greater (export) revenue diversity and more stable revenue flows, but also in terms of the quantity and quality of employment which existing industries can provide to their national populations.

Heightened Incentives for Smuggling. Continued sharp price differences between fuels in neighbouring Arab countries, owing to different subsidy regimes, have also incentivized large-scale fuel smuggling across borders. Fuel smuggling has been of particular concern among neighbouring

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64 Del Granado et al (2010, 13).

65 Jordan Times (2008).

66 Shortages in supply of transport fuels by the UAE's national oil company ENOC in the Northern Emirates in summer 2011 caused ENOC in October 2011 to release an unusually open plea to policy makers: *'With the summer months over, demand for fuel across the ENOC and EPPCO stations in Dubai has increased significantly. ENOC's retail network across Dubai currently witnesses the heavy rush of motorists, especially during peak hours. The substantial rise in the price of fuel in the international markets – the highest ever recorded since 2008 – has put a severe burden on ENOC and EPPCO, which for many years have distributed and continue to distribute fuel to end-users at a highly subsidized rate. The cost of providing subsidized fuel to our customers is expected to lead to a loss of AED2.7 billion [US$735 million] for the company this year. This also has a serious impact on our ability to expand our retail network to meet the growing demand. Very few stations have been added in Dubai recently and a number of stations had to be closed to undertake infrastructure development work. The current scenario, where ENOC has to bear the burden of higher international fuel prices while at the same time distributing fuel at subsidized rates, is clearly not sustainable or viable for the company. ENOC looks forward to the support of the concerned authorities in addressing the concern'*. Reuters, 15 October 2011.

67 World Bank (2005b).

68 Aissaoui (2012 forthcoming).

countries in the Levant, such as Syria, Jordan, and Lebanon; between Egypt and the Palestinian territories; across the closed borders between Algeria and Morocco, as well as (resulting from the 2011 uprisings) between Tunisia and Libya,[69] into and from Iraq and neighbouring countries; and from and to Yemen.[70] Fuel smuggling has also become increasingly a problem for the wealthy Gulf states.[71] Fuel smuggling not only contributes to illegal contraband trade, but in many cases substantially exacerbates existing fuel shortages in subsidizing countries. Countries such as Syria reported sharp reductions in observed patterns of cross-border smuggling in response to fuel price increases.[72]

Equity

The beneficiaries of energy subsidies. The provision of energy at low prices is not neutral in terms of the benefits. Those who consume the subsidized good most in society tend to benefit proportionately the most from such subsidies – in the case of energy these are typically higher income households, since energy consumption rates increase alongside income levels for most types of energy, including electricity and transport fuels (gasoline, diesel).[73] A recent study of the impact of energy subsidies on a group of 20 developing economies found that on average $97 out of $100 in gasoline subsidies accrued to the sample's four highest income groups, while only $3 actually accrued to the lowest income group – which had been intended to benefit from the subsidy. The largest share of subsidies, proportionately, was captured by the highest income group, which alone took more than 40 per cent.[74] Universal subsidies for lower quality fuels such as kerosene were found to be slightly less regressive, owing to substantially higher consumption rates among lower income groups. However, leakages to unintended groups were still found to be large, with 20 per cent of kerosene subsidies being captured by the highest income group, compared with 19 per cent for the lowest one.[75] The results hence show significant leakages of general energy subsidies to higher income groups, rendering energy subsidies an inefficient and costly way to protect the poor.

The value of energy subsidies, much of which have been seen to leak to high income groups, could have been invested into more effective channels that specifically target low income households, for instance through comprehensive social safety nets that involve benefits in cash rather than being tied to the consumption of energy; or into the provision of free public services such as health and education, which also provide substantially higher social returns than benefits bound to the consumption of energy. For this reason, energy subsidies can be seen as socially regressive measures, where their main beneficiaries are not low income groups. Still, the removal of energy subsidies involves significant costs for low income groups. Because of their relatively low consumption of

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69 Algérie DZ (2008); France 24 (2011).
70 For instance, see Wahab, B.A. (2006, 53–9); Bloomberg (2011).
71 e.g. see Arab Times (2011).
72 IMF (2010a).
73 This is also, where applicable, natural gas/LPG. Kerosene, by contrast, tends to be proportionately consumed most by lower income households, but substantial leakages exist to higher income groups.
74 The study included five income groups in total. Del Granado et al (2010, 12–13).
75 Del Granado et al (2010, 12).

energy, low income households often are unable to further reduce their consumption rates. Poor households are also hit proportionally hardest by second round effects of energy prices increases, for instance through increases in the price of products such as food, whose production and transport entails raised energy input costs. Any reform of domestic energy prices that is not coupled to adequate compensatory measures, such as improved social protection, will hence result in a loss of welfare for the poorest in society.

The Macro-Economy

A rapidly rising fiscal burden. International fuel price rises for oil and oil products since 2002 have contributed substantially to the rapidly mounting burden of fuel and electricity subsidies in a number of Arab countries. For energy importing countries, this fiscal burden is mostly explicit – in the form of fiscal deficits, financed through domestic or foreign borrowing (although certain off-budget activities are less easy to quantify). In contrast, part or all of the fiscal cost of energy subsidies in the Arab oil producing countries remains implicit, as foregone revenue that could have been spent or invested in forward-looking investment funds. Table 4 below shows estimates by the IEA for the size and economic weight of energy subsidies in several Arab countries.[76] For instance, the total value of energy subsidies estimated in the case of Egypt in 2010, US$20.28bn, is more than the equivalent of the country's entire budgeted fiscal deficit of $19.2bn for 2010/2011, or 9.3 per cent of nominal GDP.[77] The enormous size of energy subsidies estimated for several Arab oil producers below is striking. Moreover, for oil and gas importers such as Syria, Jordan, and Morocco, the volume of domestically consumed fuel constitutes an enormous burden in the form of a drain on foreign exchange reserves.[78]

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76 As discussed above, IEA estimates are based on a price-gap approach that compares national price levels for different fuels and electricity to some international benchmark/market price. Both the approach and outcome can be and are widely debated, with the Organization for Oil Exporting Countries (OPEC) rejecting any approach that automatically compares domestic prices to international market prices (compare with the discussion in Section 2.1. above). For the purpose of this paper, the IEA data is used to illustrate overall trends, though the data are not taken at their face value by the authors.

77 MENAFN (2010).

78 These countries' experience is discussed in greater detail below.

TABLE 4: IEA ESTIMATES OF ENERGY SUBSIDIES IN SELECTED ARAB COUNTRIES, 2010

	Average Rate of Subsidization (%)	Subsidy ($ per person)	Total Subsidy (% of GDP)	Subsidy by Fuel			Total Subsidy (US$ bn)
				Oil	Gas	Electricity	
Algeria	59.80	298.40	6.60	8.46	0.00	2.13	10.59
Libya	71.00	665.00	5.70	3.17	0.26	0.78	4.21
Egypt	55.60	250.10	9.30	14.07	2.40	3.81	20.28
Saudi Arabia	75.80	1,586.60	9.80	30.57	0.00	12.95	43.52
Iraq	56.70	357.30	13.80	8.87	0.28	2.16	11.31
Kuwait	85.50	2,798.60	5.80	2.81	0.90	3.91	7.62
Qatar	75.30	2,446.00	3.20	1.15	1.41	1.59	4.15
UAE	67.80	2,489.60	6.00	2.65	9.99	5.51	18.15

Source: IEA

Controlling Inflation. One of the chief worries about rising oil or other commodity prices is the stimulus they can give to inflation. Generally, the experience of holding down fuel prices through administered controls in order to control inflation is extremely adverse, as it leads to distortions in the economy that have to be removed at a later stage. Furthermore, if not financed by cutting government expenditure in other areas or increasing taxes, financing energy subsides could induce inflationary pressures, for instance by increasing pressure on money creation.[79]

The Environment

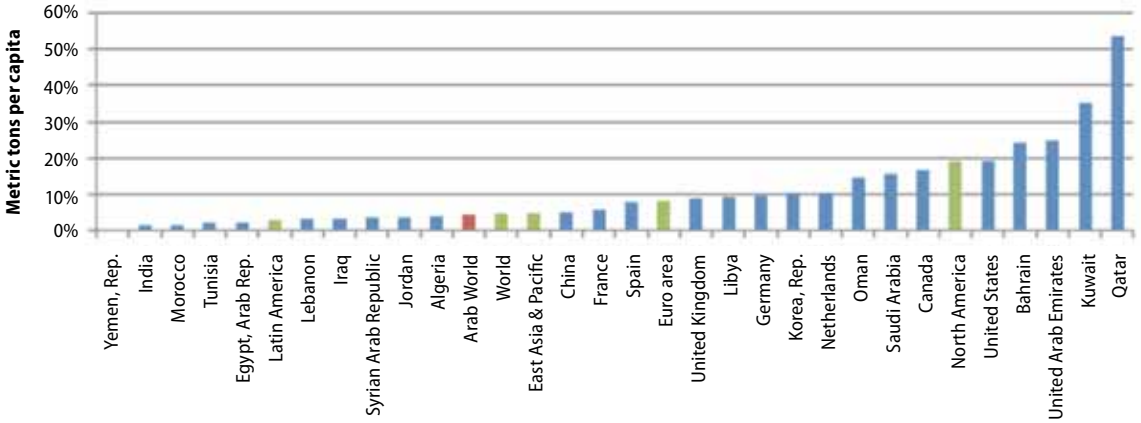
An increase in CO_2 emissions and exacerbated local pollution. The impact of fuel subsidies on the environment is not straightforward. On the one hand, by lowering end-user prices to consumers or producers, subsidies can lead to higher energy use or reduce the incentive to conserve energy, with potential adverse environmental consequences such as increasing airborne emissions and greenhouse gases. On the other hand, not subsidizing petroleum products can increase dependence on more polluting sources of energy, and can discourage income-poor households from switching towards cleaner fuels and electricity. No matter whether the net benefit of energy subsidies on the environment is positive or negative, alternative means of facilitating energy access for low income households do exist, for instance in the form of more effective social security systems that rely on cash transfers, which would not result in the large inefficiencies encountered in the Arab world's consumption of energy. The use of energy subsidies must hence be seen as not necessarily the only, or the most effective, way to protect access to cleaner energy sources.

It may safely be reasoned that the rapid rises in fuel and electricity consumption in some parts of the Arab world, coupled to a lack of incentives for energy users to rationalize energy consumption,

[79] Hope and Singh (1995); Saboohi (2001, 245–52).

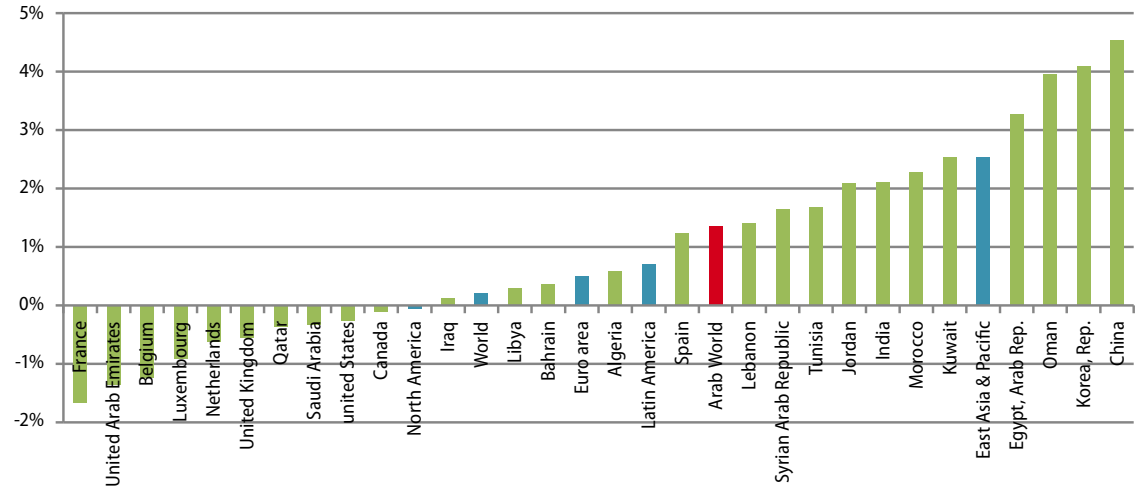
have contributed to a rapid increase in the region's CO_2 emissions. The smaller Gulf energy exporters Qatar, Kuwait, the UAE, and Bahrain face some of the highest per capita CO_2 emission rates in the world – Qatar, with more than 50 metric tons per capita, lies more than ten times above the world average of 4.6 tons. While countries such as Morocco, Egypt, and Jordan face far lower rates, their emissions levels have grown quickly in the past three decades alongside most of the Arab world, in contrast with a negative growth trend in many OECD countries. Since the 1980s, the compound average growth rate in the Arab world's per capita CO_2 emissions was 1.36 per cent per annum, more than six times the world average of 0.20 per cent per annum.

FIGURE 8: CO_2 EMISSIONS IN SELECTED ARAB, OECD, AND NON-OECD COUNTRIES (METRIC TONS PER CAPITA), 2007



Source: World Bank, World Development Indicators

FIGURE 9: COMPOUND AVERAGE GROWTH RATE OF PER CAPITA CO2 EMISSIONS IN SELECTED ARAB, OECD, AND NON-OECD COUNTRIES (METRIC TONS PER CAPITA), 1980–2007



Source: World Bank, World Development Indicators

Some forecasters, such as McKinsey, suggest that the Middle East including Iran could indeed become a major CO_2 emitter in the coming decade; in a recent report, the company sees the region to be contributing a total 10 per cent of world CO_2 emissions in 2020.[80]

Low prices of hydrocarbon-based electricity generation discourage the development of alternative energies such as wind and solar. In terms of attributes, the Arab world could be one of the most varied regions in respect of primary energy sources used, benefitting from access to many potential renewable energy sources such as solar and wind power. Interest from the region in solar energy has increased substantially over the past decade, partly in response to the growing energy needs of many parts of the region, and to advances in technology and cost profiles.[81] Initiatives such as the EU-funded Dersertec project in North Africa and the Levant provide encouraging evidence of the feasibility of large-scale projects of this kind in the region.[82] Like renewable energy, nuclear power has not yet made its way into the region, although several research reactors, as well as technology links, exist with Europe and Asian countries.[83]

While there is no lack of government plans to invest in more alternative energies in the region, the fact remains that up until now, the Arab world relies for over 95 per cent of its energy needs on oil and natural gas. Four countries – Egypt, Morocco, Iraq, and Syria – account for the bulk of the remaining 5 per cent, owing to the substantial contribution of hydropower and small amounts of coal to power generation. Morocco and Egypt are also the only two Arab countries studied in this paper with some considerable contribution of solar power, but their combined installed capacities of some 670MW in 2009 still contribute less than 1 per cent of the Arab world's total of 168 GW installed generating capacity. This general lack of energy diversity in the region may be seen as being due to a number of different obstacles, including the wide availability of oil and natural gas which are superior to renewables as a source of energy, technical challenges surrounding renewable technologies such as dusk effects, the political sensitivity of nuclear power, but also the wide availability of governmental subsidies for oil and natural gas, but typically not for alternative energies in electricity generation.

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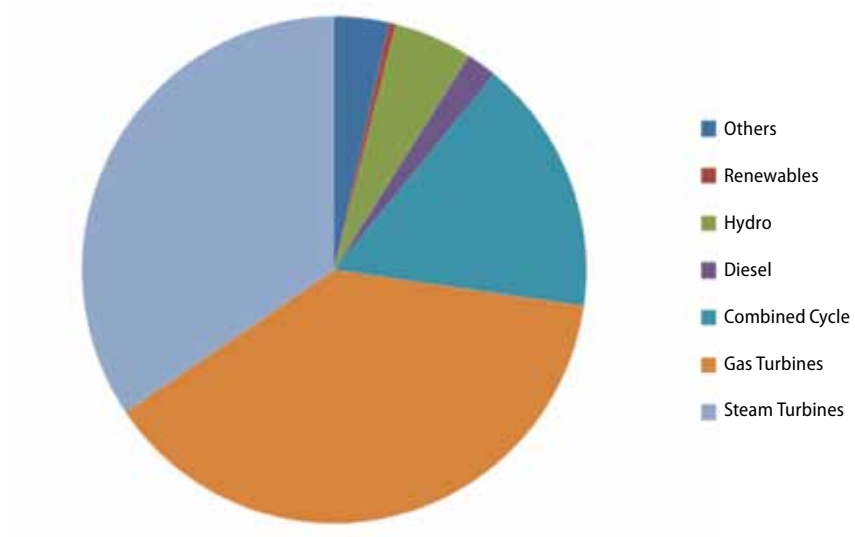
80 Bressand et al. (2007, 29).

81 For example, see a recent World Bank initiative supporting solar power projects in Morocco and Egypt: http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/MENAEXT/0,,contentMDK:22866325~menuPK:3949143~pagePK:146736~piPK:226340~theSitePK:256299,00.html; Friedman (2011); The largest renewables project in operation in the region so far is the UAE's Masdar City, whose aim is to run entirely carbon-neutral with only renewable energy sources used. See the city's website at www.masdar.ae/en/home/index.aspx.

82 For more information see the Desertec Foundation website, www.desertec.org/en/global-mission/.

83 For an overview over MENA countries' nuclear initiatives see Ebinger et al. (2011). See also, for instance, Maree (2008).

FIGURE 10: INSTALLED ELECTRICITY GENERATION CAPACITY BY TYPE OF GENERATION IN SELECTED ARAB COUNTRIES (MW), 2009



Source: Arab Union of Electricity Producers, Statistical Bulletin 2009

This lack of diversity of energy sources in the Arab world is not only of concern from an environmental point of view; it also a source of concern from a national energy security point of view – specifically in view of the increased reliance on volatile energy prices and, in the case of natural gas, long-term trade partners, either by pipeline or via LNG contracts. A recent illustration of the downside of this dependency has been Jordan's experience with repeated gas disruptions from Egypt, its main trade partner, following political turmoil in the first half of 2011 (Egypt supplies more than 80 per cent of Jordan's natural gas).[84] A more diversified energy base may hence make sense from more than one perspective in the long run, and not only for Jordan.

3.2. *Case Study:* Energy Subsidies, Investment, and Income Distribution in Egypt

Energy subsidies comprise a substantial share of government expenditure in Egypt. The Egyptian Government (GOE) subsidizes all petroleum products and natural gas regardless of whether these fuels are consumed by households or by industry, or whether they are the fuel choice of the poor or the rich. In 2009/2010, petroleum subsidies reached E£66.5 billion (US$11.2 billion), constituting 5 per cent of GDP, 18 per cent of total government expenditure, and 24.7 per cent of total government revenues.[85] This figure, however, does not reflect the true cost of energy subsidies. The production sharing agreements between the Egyptian General Petroleum Corporation (EGPC)/ Egyptian Natural Gas Holding Company (EGAS) and foreign oil and gas companies allocate a

[84] Darbouche and Fattouh (2011, 29).
[85] Kandil (2010).

share of the oil and gas extracted to the Egyptian partner. If the state-owned companies require more oil or gas to satisfy local demand, then they purchase these fuels from their foreign partners at prices close to those in international markets.

The government calculates the size of the subsidy on the basis of the difference between the price at which the national company buys from the foreign contractor, and the low price at which it sells in the market. In other words, the GOE just calculates the financial cost, not the opportunity cost involved in selling petroleum products and natural gas at reduced prices in the local market.[86] If energy subsidies are calculated on the basis of the opportunity cost, then their size as a ratio of GDP would be much higher: between budget years 2002/2003 and 2010/2011, official figures estimate the total amount of energy subsidies at E£368 billion (US$61.6 billion). Based on the opportunity cost, the cost of subsidies totals E£736 billion (US$123.3 billion).[87]

Egypt's energy pricing policy has distorted price signals and resulted in the misallocation of investment towards energy-intensive industries, thus driving investment away from labour-intensive industries that have greater capacity to absorb new entrants into the labour market. Simulation results suggest that increasing domestic energy prices to cost within a five-year period will cause the average annual growth for energy-intensive industries to fall below the reference path (in the reference case, it is assumed that no energy pricing reform will take place).[88] This is in contrast to 'Other Industries' which sees its average annual growth increase by around 1.5 percentage points above the reference path. Consequently, the share of 'Other Industries' in GDP will rise, while that of energy-intensive industries will fall following the reform of energy prices. Low domestic energy pricing has also distorted the fuel allocation decision between the domestic use of gas and the relatively more profitable export of gas. This in turn has discouraged national energy companies from undertaking investment in new local energy infrastructure, which has adversely affected energy access, especially in rural areas.

Contrary to their original intent, energy subsidies in Egypt have been found to have a regressive impact on income distribution. Table 5 below reveals the share of petroleum subsidies received by households in different expenditure quintiles. In both urban and rural areas, households at the upper part of the income distribution tend to benefit proportionately more from energy subsidies. In urban areas, households in the top (fifth) quintile capture 33 per cent of energy subsidies compared to only 3.8 per cent for those in the lowest quintile. In rural areas, the disparity is less, but the pattern is the same: households in the top quintile capture the largest share of energy subsidies.

86 Mabro (1998, 2006).
87 See Mabro (1998, 2006); Kandil (2010).
88 Abouleinein et al (2009).

TABLE 5: DISTRIBUTION OF PETROLEUM SUBSIDIES BY EXPENDITURE QUINTILE IN URBAN AND RURAL EGYPT

Expenditure Group	Urban	Rural
Quintile 1	3.8	5.6
Quintile 2	5.3	6.1
Quintile 3	7.4	6.7
Quintile 4	11	7.9
Quintile 5	33.3	12.8

Source: Abouleinein et al (2009)

For some petroleum products the disparity is particularly large. In terms of gasoline, the World Bank finds that 93 per cent of the benefits go to the highest quintile (See Table 6). This is to be expected since car ownership is heavily concentrated within high income households. A similar picture also emerges for natural gas, since Egypt's gas network is not available in rural areas where the majority of the poor reside. Research conducted by the World Bank finds that 44 per cent of the rich in urban areas in Lower Egypt have access to natural gas, while only 10 per cent of the urban poor have access to the network.[89] A major obstacle to new gas connections is the inability of low-consumption households (typically the poor) to cover the costs of connection, even if a scheme to spread these payments over time is made available to them.[90] This situation is exacerbated by the large losses incurred by EGAS from selling gas and LPG to the domestic market, which render the company unable to meet the financing requirements of connecting the residential sector to natural gas.[91]

TABLE 6: ABSOLUTE TRANSFERS RECEIVED FROM OIL AND GAS BY HOUSEHOLD CONSUMPTION EXPENDITURE QUINTILE (MONTHLY LE PER CAPITA)

Product	1st	2nd	3rd	4th	5th	Overall
Kerosene	2.51	1.97	1.49	1.25	0.74	1.61
Natural Gas	0.12	0.31	0.49	0.75	3.13	0.96
Gasoline	0.02	0.05	0.18	0.28	7.53	1.59
LPG	6.23	8.22	9.32	10.68	10.89	9.13
Above four products	8.88	10.55	11.48	12.96	22.29	13.29

Source: World Bank (2005c), Table 4.6

The inequity resulting from the current energy pricing system is also illustrated by the pricing of fuels to industry. Energy-intensive industries in Egypt achieve relatively high profit ratios when compared with similar industries in other parts of the world.[92] This partly due to subsidized energy

89 World Bank (2005c).
90 Gerner and Sinclair (2006).
91 Gerner and Sinclair (2006).
92 Khattab (2007).

products and partly to their monopoly power, which allows these industries to avoid passing on the cost reductions from low energy prices to end consumers. This has important distributional consequences, as the benefits from energy subsidies accrue mainly to the owners of energy-intensive plants, who are likely to fall within the highest income brackets.

Given the regressive nature of energy subsidies, reforming Egypt's energy pricing system would have the potential to substantially increase total welfare. Research by the World Bank finds that the distribution of half of the budgetary savings from subsidy elimination equally across the population would have a bigger impact on poverty reduction than continuing with the status quo, an indication of the inadequate targeting of current subsidies.[93] Similarly, using a CGE model, Abouleinein et al find that reform of energy prices associated with well-targeted cash transfers will benefit the poor more than the rich, resulting in large improvement in income distribution measures.[94]

In principle, the GOE could engage in some form of targeting in an attempt to reduce subsidy costs and to limit the leakage to high income groups. However, it has as yet refrained from doing so, which suggests that there are institutional, administrative, and/or political constraints that prevent the government from undertaking a more targeted approach to fuel subsidies. The unfolding political events in Egypt which resulted in the fall of President Hosni Mubarak in February in 2011 are likely to delay much needed energy pricing reform. In fact, rather than decreasing, energy subsidies in the 2011/12 budget increased to around E£95 billion (US$16 billion), up more than 40 per cent since the 2009/10 budget. There is wide recognition that energy pricing reform is much needed since, as Egypt's Deputy Prime Minister Hazim Al-Biblawi stated in August 2011, 'it is not reasonable for the government to subsidize the wealthy at the expense of the poor'.[95] There are also calls for energy-intensive industries to improve their productivity levels 'rather than use the excuse of low productivity to seek lower energy prices'.[96] Despite many plans for energy price reform in the last few years, no concrete steps have been made, and it is most likely that social and political pressures will force any future government to delay such a reform, at least in the short- to medium-term.

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93 World Bank (2005c).

94 Abouleinein et al (2009).

95 A statement issued by Egypt's Deputy Prime Minister and Minister of Finance Hazim al-Biblawi on 27 August, 2011. MEES (2011c).

96 A statement issued by Egypt's Deputy Prime Minister and Minister of Finance Hazim al-Biblawi on 27 August, 2011. MEES (2011c).

4. Reforming Energy Subsidies in the Arab World

The reform of energy prices in the Arab world remains a politically and economically challenging task. The wave of political uprisings that has confronted Arab governments across the region since early 2011, more than any other single factor, has rendered these challenges all the more important. Key to making the future reform of energy prices in the Arab world politically feasible, will be the ability and willingness of governments to address the economic and social costs that energy price rises will entail; by designing price reforms in ways that fit national circumstances, and by putting in place effective mitigation measures that protect the poorest and assist the economy in its long-term adaptation. This section first highlights some of the potential social and economic costs of subsidy reform; it then discusses different options available to governments for the design and mitigation of pricing reforms. It concludes with some recent experience of reform from within the Arab world – a case study of fuel and electricity price reform in Jordan.

4.1. Social and Economic Costs of Subsidy Reform

Governments face a number of real challenges when revising their energy pricing systems. Although energy subsidies are a costly and are a regressive way of distribution, reducing or eliminating energy subsidies in the absence of compensatory programmes will impact real incomes and lead to a decline in households' welfare. The effect of the removal of energy subsidies on households will be two-fold: *directly*, through higher prices of consumed energy such as electricity and household fuels; and *indirectly*, through higher prices for other consumer goods that use energy as an intermediate input.[97] Energy is typically an important part of the consumer basket but other consumer goods such as food – the price for which is often also a function of energy inputs during production, transport, and storage – can substantially increase the cost of living for all household groups. Given the relatively high energy intensity of many Arab countries' economies, energy pricing reform is likely to induce a large indirect effect on households' income. Low income households are usually impacted most adversely, because of low levels of consumption and lack of ability to further compromise the consumption of essential goods such as food and energy in the face of rising living costs.

Energy pricing reform can also affect the competitiveness of domestic industries and firms. Higher energy prices associated with pricing reform have the effect of increasing the cost of industrial inputs, which could include input fuels (natural gas, electricity, crude oil, gasoline), or oil-based products such as raw materials for plastic industries, asphalt for the construction sector, and chemical fertilizers for agricultural activities. This direct effect increases the output price of other

[97] For a detailed discussion see, for instance, Del Granado et al (2010).

industries, which in turn causes a new round of indirect cost effects. Depending on the industry's competitive structure and the ability of firms to pass the increased cost on to final consumers, the increase in the cost structure reduces the profit margins of domestic industries, eroding their global competitiveness. This could also make it harder for such firms to secure funding, increasing the cost of financing new projects and undermining their long-term investment plans. The industries that are likely to be affected the most are those with high energy intensity, and those that face high competition (such as petrochemicals) and/or price controls (such as electricity) that prevent them from passing on rising costs to final consumers. In the long run, industrial establishments/firms have the option to adjust their production technology (at least partially) to offset the burden of increased input costs. However, long-term adjustments require that firms survive in the short-term and have access to funds, via internal or external financing, to implement technology adjustment and upgrading processes.

The impact of energy pricing reform on industry can also operate through the demand side. Specifically, the cost shock associated with energy pricing reform may result in underutilization of capacity. This in turn lowers employment and reduces overall demand, causing a reduction in economic activity.[98]

Thus, energy pricing reform could induce wide macroeconomic effects through a variety of channels. Abouleinein et al[99] constructed a CGE model for Egypt, to estimate the potential impact of energy subsidy removal on key macroeconomic indicators such as GDP, consumption, exports, imports, and investment. In one of the scenarios, they consider the case in which energy prices are lifted to their cost (the average price level of petroleum products increases by 831 per cent). In the absence of any compensatory measures, they find that the impacts on key macroeconomic indicators such as GDP, total private consumption, and export activity are negative. Adjusting prices to the cost of production also induces a sharp increase in the consumer price index.

Against these short-term effects, in the long term energy price reform can improve the economy's growth prospects through improving the productivity of capital, technological innovations, and international competitiveness, and by reducing energy intensity. For instance, Hang and Tu[100] find a strong link between high energy prices and lower energy intensity in China. Similarly, in the context of Central and Eastern Europe, Cornillie and Fankhauser[101] concluded that an increase in energy prices was the most important driver of efficient energy use.

In terms of its impact on inflation, increases in energy prices could be deflationary in the medium term. Specifically, the policy of removing subsidies/raising energy prices is like an increase in indirect tax.[102] Since fuels and electricity are components of the CPI, an increase in their prices will be reflected in an increase in measured inflation (the first round effect). Initial evidence from regional energy price reformers – Jordan and Iran – suggests that these initial price spikes can be

98 Clements, Gupta, and Jung (2003).
99 Abouleinein et al. (2009).
100 Hang and Tu (2007, 2978–88).
101 Cornillie and Fankhauser (2004, 283–95).
102 Its effects are the same as a policy of increasing the tax on fuel and domestic energy.

high, although consumer price inflation levels fall sharply in the months after the reform.[103] As this first-round effect feeds through into the economy, the real incomes and spending power of those who pay the higher prices fall. Thus, such a policy is price-raising but deflationary in the medium term. The first-round effects are likely to be one-off effects and to disappear within a relatively short period of time.

The risk is that first-round effects could induce second-round inflationary effects. This may occur for instance if, in response to the increase in the cost of living, workers demand an increase in wages to compensate for the loss in their real income, or if governments respond by increasing public wages. Second-round price effects are likely to be more prolonged, especially if inflation is built into economic agents' expectations. The strength of the second-round effect varies across countries, and depends on factors such as the strength of labour unions, the balance of power between employers and employees, the unemployment rate, and the credibility of monetary policy. Generally, a credible inflation-countering strategy often results in a low and stable inflation environment which helps anchor inflation expectations. This in turn will influence the price-setting behaviour of agents in the economy, reducing the risk that first-round inflation feeds into second-round effects.

4.2. Reform Options

The Size and Timing of Subsidy Reform

Governments have the choice to eliminate implicit and explicit subsidies and to move prices to their cost or shadow cost level.[104] In the case of traded goods such as oil, natural gas, and oil products, a reform can go all the way to bring the final prices broadly into line with international prices, or to a price above the marginal cost but below international prices. For non-tradable goods and essential services such as electricity and water, it can equate the price with the cost of production. A fast and comprehensive reform involving moving prices for all fuels and electricity to their respective shadow cost or marginal cost level across consumer sectors can have many advantages, including the maximization of fiscal savings and hence funds being available for mitigation measures. It will also generate a maximum demand response in the form of reduced total energy consumption and changed consumption patterns via a clear price signal.

However, comprehensive subsidy reforms also maximize initial price increases, and in consequence maximize the price shock to the economy. Particularly during times of existing political protests, government may be reluctant to engage in a reform of such a magnitude. A potential option in such cases is a gradual reform of energy prices, which spreads out price rises over multiple steps and over a period of several months up to several years. The potential gains for the economy include smaller, individual price rises, and more time for structural adaptation. Nevertheless, gradual price reforms come with their own costs, including the risk of protracted inflation and rising inflationary

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103 IMF (2011c), IMF (2009).

104 See Section 2.1. for definitions.

expectations, and an inherent risk of future policy reversions in response to popular opposition to consecutive price rises. Gradual reforms also reduce initial fiscal savings, and hence the funds available for mitigation schemes such as compensatory cash transfers.

Mitigation Measures

Evidence from both within and outside the Arab world suggests that coupling the reform of domestic energy prices to a set of effective mitigation measures can help governments to minimize the social and economic cost of subsidy reforms. Well-implemented mitigation schemes can help protect low income groups against an erosion of their real incomes; can protect the domestic demand base for industries and businesses; and can help raise public acceptance of pricing reforms considerably. Governments have multiple strategic tools at their disposal, including a range of options to redistribute revenue proceeds from energy price rises. The choice of reform strategies depends on the specific country context, which can include the size of price increases (and hence the revenue proceeds available for distribution), the fiscal soundness of government budgets, the administrative feasibility of targeted or untargeted benefit schemes, the effectiveness of existing social welfare nets, as well as the extent of existing levels of absolute poverty within the reforming country. The following provides a brief overview of some of the main mitigation options.

Targeted Energy Subsidies are a way of reducing the total fiscal burden of subsidies coupled to the continuation of some, usually limited, subsidies for specific beneficiary groups. According to a recent UNEP report, 'targeting subsidies effectively so that their benefits are limited to a clearly defined targeted group should be the first consideration in designing or reforming a subsidy programme'.[105] Beneficiaries can include particular sectors of the economy, for instance industry users (including energy-intensive industries which derive much of their international cost-competitiveness from the availability of low-cost fuel and feedstock for their production);[106] households; or, within the category of households, particular income groups whose consumption levels are secured through the provision of limited quantities of certain fuels, and low-priced electricity. Alternatively, governments can engage in categorical targeting, by subsidizing fuels or electricity deemed to be consumed primarily by the targeted group. Categorical targeting is fairly simple to administer, it is based on the strong assumption that poverty differs between categories but is similar within categories. Kerosene remains the most widely used type of fuel by the poor in many countries; LPG has been subsidized to help more poor households access this relatively cleaner and more efficient source of energy in, for example, Morocco, Jordan, and Yemen.

However, experience has shown that targeted subsidies are often very difficult to implement in practice, owing to other factors or costs involved that may outweigh the benefits of targeted subsidies.[107] First, targeted subsidies involve administrative costs such as acquiring information

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105 UNEP (2008, 22)

106 In addition industries, unlike households, have very few alternatives to energy subsidies if their cost structures under the new pricing regime render them uncompetitive vis-à-vis international competition, even after energy efficiency investment has been made.

107 Van de Walle (1998); Coady, Grosh, and Hoddinott (2004).

about a target group and conducting surveys to identify more target groups. The more precise the information required, the higher the administrative costs, and the lower the budget available for distribution. In countries where administrative capacities are limited, often in combination with large, informal economies, a particularly high potential exists for corruption and limited targeting success. Targeted programmes also tend to involve private costs (e.g. for the provision of official papers), and can carry social stigma, which limits take-up rates. The empirical evidence on the impact of targeted subsidies on poverty is not conclusive,[108] especially if targeted programmes undermine the political support for the programme and/or generate deadweight loss.[109]

In countries where substantial subsidies are extended to industry, there is a strong case for abolishing subsidies on fuels used by industry. Evidence from Egypt suggests that subsidies to industries do not help alleviate poverty.[110] Instead, fuel subsidies result in a concentration of profits in owners' hands and an overinvestment in relatively less efficient sectors of the economy. Providing fuel subsidies to producers in order to control increases in consumer prices is also unlikely to work, because cost reductions are not necessarily fully passed on to consumers. Whether these savings will be passed on to consumers depends on the market structure, the degree of competition, and in case of monopoly, the effectiveness of the regulator. Evidence from Egypt suggests that removing fuel subsidies to industries is much less controversial than removing subsidies to households.[111] This is particularly the case where the profit margins for these industries are quite high and they are hence in a good position to absorb the rise in fuel prices.

Targeted Cash Transfers. The most ambitious reform is to eliminate all fuel subsidies and use budgetary savings to finance targeted transfer programmes directed towards the poor. Targeted transfers are typically based on two types of targeting mechanisms: *administrative targeting* in which the government or the programme administrators determine who will be eligible to participate or receive the benefit, on the basis of a set of criteria. In most cases, criteria involve either a form of income-testing, or specific contingencies such as unemployment, or a combination of both. *Self-targeting mechanisms*, by contrast, entail a transfer coupled to the subsidy for all, which is designed in such a way, however, that only low income groups have an incentive to use it.

Targeted transfers have many advantages over other distributive schemes: unlike targeted subsidies on energy prices, cash transfers do not link benefits to fuel consumption, and hence avoid gaps typically associated with pro-poor fuel subsidies; nor do they result in the kind of economic distortions associated with general fuel subsidies, such as wasteful energy consumption behaviour and lack of efficiency. By being income- or contingency-based, targeted transfers also minimize leakages to unintended groups, in comparison with universal subsidy or transfer programmes. Cash transfers are by nature transparent, because they appear as budgeted government spending on public accounts. Revising cash transfer programmes at a later stage is typically more accepted by the public than are multiple, large price revisions for fuels and electricity. Households also tend

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108 Besley and Kanbur (1993); van de Walle (1998); Ravallion (2003).
109 Ravallion (2003).
110 See Section 3.2. for a detailed analysis of the Egyptian case.
111 e.g. Abouleinein et al (2009).

to prefer cash transfers to direct subsidies, given that they do not link benefits to energy consumption, and enable households to have a choice over how to spend their benefits.

The Syrian case illustrates experience with fuel price rises in combination with targeted transfers. Largely unnoticed by the international press, Syria considerably reformed its fuel prices in 2008, more than tripling the price for diesel (through part of this increase was taken back in 2009), and raising prices for fuel oil, kerosene, and gasoline by more than a third. Price rises were accompanied by public sector wage rises, and an additional rationing coupon system by which each household was allowed to buy up to 1,000 litres of diesel at a subsidized price. The coupon system was replaced in 2009 by targeted cash transfers. Targeting criteria included a combination of factors such as income, asset ownership, and the size of households' utility bills. The IMF estimates that approximately half of all Syrian households qualify for the transfer.[112] Since 2008, the Syrian government has increased prices for some fuels further, coupled to renewed heating oil allowances for public sector employees and pensioners. In January 2011, prior to the breakout of political protest in Syria, the government announced the creation of a National Welfare Fund,[113] designed to compensate low income households for future fuel price rises, although its implementation has been held up at the time of writing owing to the outbreak of political protest in March 2011.

Like targeted subsidies, targeted transfers can suffer from systematic shortcomings such as administrative and private costs, problems in assessing income levels, and identifying beneficiaries, leading to incomplete coverage, as well as social stigma. Unsuccessful targeted programmes can cause of loss of political support for the scheme and hence reduce the allocation of resources devoted to it.[114] For this reason, Van de Walle also notes that 'narrow targeting often has hidden costs, and once these costs are considered, the most finely targeted policy may not have any more effect on poverty than a broadly targeted one'.[115]

The Use of Existing Social Safety Nets. A fast and cost-effective way of reforming energy prices is to mitigate the effects by using available safety nets. Where a social safety net already exists, the budgetary savings from eliminating subsidies can be used to expand the size of the programme. Jordan, following its reform of fuel prices in 2005 and 2008, stepped up, reformed, and expanded its social safety networks, for instance through special budgetary allocations to the country's National Aid Fund. The country also raised public sector workers' wages (an example of public employment functioning as a de facto social safety network), introduced a separate compensation scheme for private sector employees, and upgraded its existing food subsidy programme (see also Section 4.3. for a more detailed discussion).[116] As part of the Jordanian social security programme, more than 50 per cent of the workforce is now covered by social insurance against unemployment and illness. The country also introduced statutory retirement and early retirement ages for men and women, and considerably enhanced pensions protection.[117] Syria similarly coupled its 2008

112 IMF (2010a, 10).
113 Syria Today (2011).
114 Coady, Grosh, and Hoddinott (2004).
115 Van de Walle (1998, 231).
116 World Bank (2010, 90); Arabian Business (2008).
117 Social Security Corporation (2009).

fuel price rises to a 25 per cent increase in public sector wages, in addition to other compensatory schemes.[118]

Egypt, on the other hand, illustrates that the use of existing safety nets is not always the best option. The country has three main safety nets: a consumer food subsidy programme; a cash transfer programme to the unemployable poor; and a social fund programme. The food programme provides subsidized bread and flour to all Egyptians, in unlimited quantities. In addition, holders of ration cards can benefit from rationed goods such as sugar, cooking oil, rice, and tea which are available in limited quantities. There are two types of ration cards: a low-subsidy ration card which is theoretically available to all Egyptians (except those who let their card expire by not using it for three months) and a high-ration card which is intended to target individuals meeting certain criteria. One could suggest that these existing ration cards could be used to distribute fuel subsidies. However, this assumes that existing safety nets are efficient at targeting the poor. This is not the case in Egypt, where evidence suggests that existing safety nets are ineffective in reaching the poor and are unable to raise them above poverty levels. For instance, in the case of ration cards, the World Bank found that poor Egyptians are less eligible for a high-subsidy ration card than non-poor Egyptians, as the eligibility criteria (for instance being a pensioner or a public sector employee) are not pro-poor.[119] Similar conclusions probably apply to the Syrian model, which similarly links some compensation schemes for higher fuel prices to the same criteria. In the case of Egypt, these regressive eligibility criteria are also not well enforced – more than two-thirds of those holding high-subsidy ration cards do not meet the relevant criteria. As a result of these inefficiencies, households in the top quintile receive around 20 per cent of subsidies of the rationed products, compared with less than 16 per cent for the lowest quintile. In terms of coverage, a third of the poor are excluded from the benefits of ration card subsidies because they do not have cards.

Universal Programmes. An alternative mitigation measure – given the limitations of alternatives such as implementing a narrowly targeted programme, some form of categorical targeting, or the use of existing social safety nets – could be the elimination of energy subsidies in favour of a system of universal, unqualified cash transfers. There are indeed many arguments in favour of untargeted transfers. First, they minimize errors of exclusion. In a survey of nine developing countries, Cornia and Stewart found that universal food subsidies are associated with significantly lower errors of exclusion than targeted programmes.[120] Second, developing targeted transfer programmes requires administrative capabilities which are often not readily available, are very costly to develop, and may be more open to corruption. Third, untargeted transfer programmes are more likely to succeed and survive, since these programmes receive wider political support than targeted transfer programmes.[121] Finally, making transfers conditional on certain criteria – such as the level of income of the household – can induce behavioural responses that reinforce poverty. For instance, households may be reluctant to increase their income above a certain level, or to report such an increase, in order to avoid losing generous transfer entitlements, or they may decide to reduce

118 IMF (2010a, 10).
119 World Bank (2005c).
120 Cornia and Stewart (1993)
121 Cornia and Stewart (1993); Skocpol (1991); Gelbach and Pritchett (2002).

their labour supply. Universal subsidies, on the other hand, generate only an income effect but no substitution effect and thus are expected to have a less significant impact on work incentives.

The Arab's world close neighbour Iran began to eliminate fuel subsidies with effect from December 2010. The country now distributes its oil and natural gas revenues via a universal cash programme, illustrating how universal schemes could be an attractive policy solution, particularly for the Arab world's energy producers and exporters (see Box 2 below).[122]

BOX 2: THE IRANIAN ENERGY SUBSIDY REFORM OF JANUARY 2010

In January 2010 the Iranian government began what was perhaps the most comprehensive energy pricing reform seen so far among major energy producing and exporting countries in the Middle East. The reform came in response to years of rising costs to its budget of fuel and electricity subsidies, in a country with among the world's lowest prices of liquid fuels and natural gas. The total value of subsidies as part of public expenditure had reached US$100 billion by 2010 – some 30% of GDP – 90% of which were energy subsidies. The Iranian subsidy system has been widely criticized as being highly inequitable, leading to excessive levels of energy consumption, environmental pollution, and smuggling to neighbouring countries.[123] With the reform taking effect in December 2010, Iran increased gasoline prices by 400%, natural gas (>700%), diesel (1,000%), electricity (<300%), and water prices virtually overnight.

Iran's reform of energy prices was, from the beginning, coupled to an overhaul of the country's existing social security system, and to the introduction of a large-scale compensatory cash transfer programme, that would benefit large parts of the population. The original plan of June 2008 had been the elimination of energy subsidies, in combination with targeted, direct cash grants to the population, which would contain an element of redistribution in favour of low income households. Problems with the design of the initially means-tested transfer scheme, and parliamentary opposition to initial plans for the pace of the reform package, led to the revised January 2010 law, which contained a more gradual reform pace and a revised transfer scheme. The eventual transfer scheme is universal, includes both adults and children as recipients, and is unconditional, requiring only nationality and registration (despite government reference up until now to a 'targeted' cash grant).[124]

First reactions to the programme from international financial organizations have been overwhelmingly positive. By December 2011, subsidies worth an estimated $60 billion dollars (15% of GDP) will have been removed from the public budget over a period of a mere 12 months. A figure of $30 billion was thus available for cash transfers, and a further sum of $10–15 billion has been used to help industry (particularly in energy-intensive sectors) to restructure and reduce its energy intensity.[125] In a recent statement following a visit to Iran, the IMF concluded that 'the energy price increases are already leading to a decline in excessive domestic energy consumption and related energy waste. While the subsidy reform is expected to result in a transitory slowdown in economic growth and temporary increase in the inflation rate, it should considerably improve Iran's medium-term outlook by rationalizing domestic energy use, increasing export revenues, strengthening overall competitiveness, and bringing economic activity in Iran closer to its full potential.'[126] The IMF estimated inflation in Iran at 10.1% in December 2010, with an increase to 14.2% by May 2011. This was less than had been initially expected following and energy price increase of over 20 times in the second half of 2010.[127]

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122 For a detailed discussion of the Iranian experience so far, see Tabatabai (2011, 1–24); Tabatabai (2012 forthcoming); Guillaume, Zytek, and Farzin (2011).

123 Tabatabai (2011,4).

124 Tabatabai (2011, 10–11).

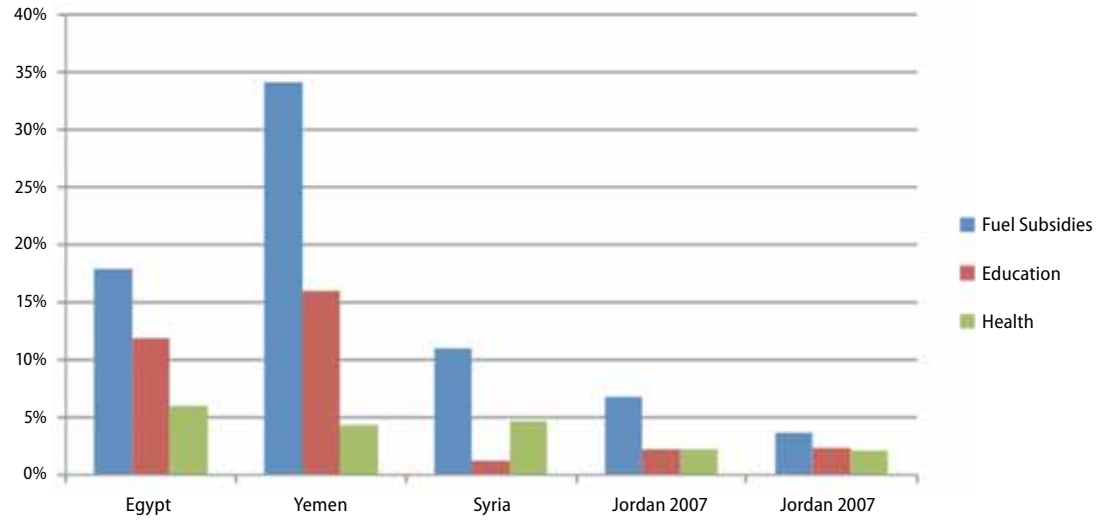
125 Guillaume, Zytek, and Farzin (2011, 3)

126 IMF (2011d).

127 IMF (2011d); See also Guillaume, Zytek and Farzin (2011).

Reprioritizing Public Expenditure. Governments also have an option to use part of the proceeds of pricing reform to invest more actively in specific priority sectors. In many cases, the share of government expenditure on fuel subsidies exceeds social spending on pro-poor sectors such as health and education; in Egypt, for instance, total government expenditure on energy subsidies in 2008 equalled the country's combined expenditure on health and education, as did fuel subsidies in Jordan prior to the country's 2008 reform of fuel prices.[128] Yemen's budgeted expenditure on fuel subsidies in 2008 amounted to more than 34 per cent of total government expenditure – more than one and a half times its expenditure on education and health combined (see Figure 11).[129] Syria's expenditure on fuel subsidies in 2008 as a share of total government expenditure greatly exceeded health and education spending (a total of S£66.3 billion). In October 2008, Syrian Minister of Petroleum and Mineral Resources Sufian 'Alaw put the figure for Syria's total fuel subsidies in 2008 at S£340 billion, more than five times this amount, owing to higher than expected international prices. 'Alaw is cited by MEES, commenting at the time, that by liberalizing the prices of fuel oil and diesel oil, the Syrian government could double public sector salaries and still have some surplus left.[130]

FIGURE 11: SHARE OF GOVERNMENTAL EXPENDITURE ON FUEL SUBSIDIES, EDUCATION, AND HEALTH IN SELECTED ARAB COUNTRIES, 2008



Source: Egypt: World Bank (2011); Yemen: Breisinger et al (2011), Authors' own calculations; Syria: IMF (2010a), MEES, World Bank (2011); Jordan: IMF (2010b), World Bank (2011).

128 In 2008 Egypt spent 11.93% of gross annual expenditure on education, 5.94% on health, and an estimated 17.85% on fuel subsidies. World Bank (2011); IEA; Subsidy estimates based on IEA and World Bank (2011);

129 Breisinger et al. (2011).

130 Syria's 2008 'subsidy' item includes 'other subsidies' which are combined in the IMF published revised budget numbers for 2008 (a total of S£66.3 billion). In October 2008, Syria's Minister of Petroleum and Mineral Resources Sufian 'Alaw stated that Syria's total fuel subsidies in 2008 stood instead at S£340 billion, more than five times this amount, owing to higher than expected international prices. 'Alaw is cited by MEES commenting at the time that by liberalizing the prices of fuel oil and diesel oil, the Syrian government could double public sector salaries and still have some surplus left. MEES (2008); IMF (2010a, 18).

One set of priorities could involve a shift of investment from fuel subsidies to other sectors, particularly pro-poor sectors including education and health, as well as social protection and, where feasible, public sector wages. The expansion of schools and universal health care remains a challenge in many parts of the Arab world, but one likely to bring benefits to the economy in the long term. Governments can also reprioritize expenditure in areas that generate more business and profitability, for instance via funding channelled into industry-oriented programmes aimed at increasing productivity and energy efficiency rates, for instance via loan schemes and company auditing; tax credits on certain industries; or more direct industry-based subsidies.

Connection Subsidies. Evidence from individual countries suggests that fuel subsidies can play a very limited role in raising access to modern forms of energy such as electricity. The case of Yemen illustrates that fuel subsidies may have had the opposite effect. Fuel subsidies which result in large losses for national oil companies or local distributors undermine incentives for suppliers or distributors to extend energy infrastructure to local populations. In countries that have witnessed dramatic improvements in access, it was achieved through public investment in infrastructure rather than through the granting of fuel subsidies. One of the main obstacles to accessing modern forms of energy such as LPG, natural gas, and electricity is the high initial costs of connecting to these sources. Thus, rather than opting for *fuel* subsidies, there might be a case for energy *connection* subsidies, especially in low coverage areas such as in rural Yemen or urban Egypt.

However, the success of such a policy would depend on a number of factors, such as the willingness and ability of distributors to extend the network access to poor households. For instance, in Egypt's case, natural gas distributors have no incentive to provide access to poor areas because poor households have a low volume of gas uptake and are reluctant to enter into long-term contracts. In Yemen, the cost of grid provision does not favour any extension of access to populations living in dispersed settlements, divided by difficult terrain, and with low consumption. Thus, there has been an increasing emphasis on off-grid alternatives.[131] The effectiveness of connection subsidies also depends on whether poor households are willing or able to pay for a connection. In Egypt, poor households were not encouraged to take on gas connection, despite the government requiring or charging only a fraction of the cost of the connection.[132]

Long-term Fuel Price Adjustment

A potentially important long-term determinant of energy subsidy reform success can be the way in which energy prices adapt to market fluctuations on a permanent basis. Once domestic prices have been adjusted, regulated markets imply that future fluctuations in international prices will reopen a disparity between domestic price levels and shadow price levels. In the absence of fully deregulated energy markets, the reform of energy prices without a long-term adjustment mechanism will hence be likely to result in the re-emergence of energy subsidies. Discretionary or ad hoc price adjustments may be used by governments to close the gap, but they render price adjustments

131 See, for instance, a UN ESCWA sponsored electrification project in Yemen: Deghaili, W. (2009).
132 Gerner and Sinclair (2006).

contingent on governments' willingness to adjust prices in the first place. With mounting political pressure on governments to refrain from further price increases, the reform of subsidies may be jeopardized; and potential future price adjustments may result in irregular, sudden, and comparably large price rises contingent on considerable new fiscal pressure.

An alternative can be the introduction of an automated, rules-based price adjustment mechanism for domestically consumed fuels, which updates domestic prices at regular intervals. The advantages of automated price adjustments are various: they ensure regular price revisions, and thus limit the chance for new build-ups of energy subsidies; by involving regular price revisions, automated adjustment mechanisms reduce one-time price rises and also pass through declines in international prices; by linking the revision of prices to automatic rules, energy price decisions are to a greater extent de-politicized than under discretionary, ad hoc government-induced adjustments. Finally, automated price adjustment mechanisms can help smooth the effect of future fuel price volatility on international markets, for instance by basing monthly prices on an average of the previous month's prices on international markets. One downside of automated price adjustment mechanisms is a certain potential for fuel hoarding prior to expected fuel price rises, which needs to be addressed separately, for instance by limiting the time between price adjustments.

Communication and Transparency

Effective communication of reforms, together with transparency, can be a critical tool for the success of pricing reform. Ensuring that the reform and its potential benefits for the economy are widely understood is likely to increase popular acceptance and limit protest and opposition (the Jordanian case, discussed in greater detail below, is a case in point). Communicating the reform's rationale and objectives can involve publicizing the rationale for price reforms, including the economic, social, and environmental costs of low energy prices and how these are being paid for; and the objectives for reform, such as the consolidation of government finances and greater availability of funds for other social expenditure. Information about compensatory schemes, such as cash transfer programmes or targeted subsidies, should be included in any discussion of the reform. A recent IMF review of 40 country experiences between 2002 and 2006 revealed that the likelihood of subsidy reforms almost tripled in the presence of strong political support and proactive public communications.[133]

4.3. *Case Study:* The Jordanian Energy Price Reform

Starting in 2005, Jordan implemented a relatively successful reform programme which resulted in the gradual elimination of energy subsidies over a three year period. This success follows previously unsuccessful reform efforts in the late 1980s and early 2000, when large-scale demonstrations had forced the Jordanian government to reverse its reform plans.[134] Before this programme,

[133] IMF (2011b, 47).
[134] Arabian Business (2008).

Jordan used to import crude oil, some of which was at concessional prices (from Iraq until 2003 and Saudi Arabia until 2004), refine it at the Jordan Petroleum Refinery Company, and then sell the refined products at controlled prices. The losses incurred by the refinery were reimbursed by the government directly from its budget, increasing pressures on public finances. Higher import prices for crude oil since 2004 led to a rise in the cost of fuel subsidies in the Kingdom that became increasingly unsustainable.

In July 2005, the government increased the price of petroleum products as a first step in a three-stage plan to eliminate subsidies and liberalize the energy sector. The price increases were dramatic and saw gasoline prices increase by around 10 per cent, while fuel oil for power and industry increased by 33 per cent and 59 per cent respectively. These domestic price increases, however, did not prevent the size of energy subsidies from increasing as oil prices in international markets continued to rise. Consequently, the government decided to raise fuel prices again in 2005 to prevent further deterioration in the budget deficit. The second stage of the subsidy plan was put in effect in 2006 when the Jordanian government increased energy prices in April of that year. As in the first stage, the price increases were dramatic, ranging from 1.3 per cent for jet fuel to 65 per cent for fuel oil to the power sector. In 2007, the government resisted passing the increase in oil prices on international markets to the domestic market. This decision was, however, overturned and in 2008 the government decided to remove most energy subsidies, resulting in large price increases which ranged from 16 per cent for gasoline to 76.5 per cent for LPG. To ensure that domestic prices are aligned with those in international markets, the government set up a committee in 2008– comprising members from the Ministry of Energy and Mineral Resources, the Finance Ministry, and the Jordan Petroleum Refining Company – to set the price on a monthly basis based on a formula which reflects international prices and freight allowance. The implementation of this price adjustment mechanism helped reduce the risk of policy reversal.

As a result of these reform efforts, the size of energy subsidies declined from 5.8 per cent of GDP in 2005, to 2.6 per cent in 2006, and 0.4 per cent in 2010.[135] This helped the government improve its public finances, but not without having adverse consequences on households and industry. Estimates of the impact of price energy increases on households' income are substantial. Coady et al estimated that energy price increases generate a direct income effect of 2 per cent, and an indirect income effect of 2.4 per cent, i.e. a total decline in a household's income of 4.4 per cent.[136] They also find that the impact on households in low income brackets is likely to be higher than that on households in high income brackets.

To mitigate the impact of energy prices rises, the Jordanian government has, more recently, invested considerably in measures aimed at protecting poor- and medium-income households. Public sector wages and pensions were raised with an average wage increase of between $63 to $70 per month, and $150 to $220 for families with a monthly income of $1000 or less. Low income earners in the private sector received a separate compensation scheme. An estimated 60 per cent of Jordan's population of some 5.8 million benefited from these wage increases. In addition, Jordan reformed

135 IMF (2010b); Coady et al.(2006).
136 Coady et al. (2006).

and expanded its existing social safety networks. The country's National Aid Fund, the country's main body through which targeted cash transfers are distributed, was stocked up with funding and its targeting scheme improved. In addition, lifeline tariff schemes for electricity and an upgraded food subsidy programme targeted poor and low income households to offset the negative consequences of energy price rises.[137] The initial mitigation programme was estimated to be equivalent to 7 per cent of GDP – it was advertised widely to gather acceptance for the subsidy reform. In 2010, the government further reformed its social system by introducing a new social security law, aimed at further improving social protection while lending further credibility to the government's reform efforts.

The Jordanian fuel subsidy phasing-out is now considered initially successful, 'in part because it was well designed and the public understood that it was needed.'[138] However, in January 2011 Jordan reversed some of its earlier steps towards reform, at least for the time being. Following popular protests against rising living costs and unemployment in parallel to the Tunisian uprisings, the government approved a US$230 million package to reduce food and fuel prices, and temporarily suspended its automated fuel adjustment mechanism in an effort to curb further fuel price rises.[139]

Unlike the case in some other countries, Jordan pursued a separate reform strategy for its electricity sector. In 1999, Jordan unbundled its power sector and created an independent regulator to oversee it. Jordan's power stations were merged into a newly created company, the Central Electricity Generating Company (CEGCO). CEGCO sells its output to the National Electric Power Company (NEPCO), which owns the transmission network and is the system operator. It is also responsible for procuring the fuel inputs for power generators. NEPCO in turn sells electricity to distribution companies at regulated prices, who in turn sell it to end users also at regulated prices. Electricity tariffs are often revised by the Electricity Regulatory Commission to ensure that prices charged by electric companies are sufficient to recover costs and allow them to earn a reasonable return on its investment.

However, in the last two years, NEPCO has been incurring some serious losses. The interruption of gas supplies from Egypt meant that NEPCO had to resort to purchasing oil product fuels at prices linked to international prices. On the other hand, it has to sell the resulting power production at regulated prices that did not rise in line with increasing fuel costs. In August 2011, the Jordanian finance minister announced that NEPCO had incurred losses of $1.128 billion up to that point in 2011, which have to be financed by the government.[140] However, energy subsidies to the electricity sector are projected to end by 2012. More generally, the Jordanian case shows the importance of revising fuel prices within a broader context of energy pricing reform, and liberalization of the entire energy sector including the power sector.

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137 World Bank (2010), Subsidies in the Energy Sector: An Overview, 90; 'Fuel prices skyrocket as Jordan cuts subsidies', Arabian Business, 9 February 2008

138 World Bank (2010, 90)

139 IMF (2011b, 47); Al Arabiya News (2011).

140 'Jordan's Subsidies For 2011 Estimated At $2bn', MEES (2011b).

5. Conclusions

Much of the literature studies energy subsidies from particular perspectives, for instance from the environmental perspective (through their contribution to emissions); from a public health perspective (through their impact on access to cleaner cooking fuels); or from an energy security perspective (with lessened energy subsidies making more oil available to the market, which will reduce its price). This paper provides an analysis of energy subsidies as an economic and social policy issue. It emphasizes the need to study energy subsidies more in terms of their contributions and unintended consequences on social and economic development goals. This paper also focuses on one of the world's most diverse regions in terms of energy resource endowment and levels of economic development – the Arab world which includes energy net importers as well as major energy-exporting economies.

Energy subsidies in the Arab world are characterized by a wide variation in terms of socio-economic policy objectives, and in terms of government approaches towards financing them. Poverty alleviation and the protection of households' incomes remains one of the most fundamental goals behind energy subsidies, having particular relevance for Arab states which are importers of energy and which also experience relatively high levels of poverty. In the absence of alternative welfare systems, energy subsidies often remain de facto an important social safety net, helping to increase access to energy as well as contributing to lower prices for other goods in the economy. For many of the Arab energy producers, on the other hand, the provision of low-cost energy remains a critical tool to diversify their economies and to distribute wealth, much of which is generated from oil and natural gas exports. Many of these countries would not consider their energy prices subsidized, arguing their domestic prices reflect in most cases the cost advantage of producing different fuels domestically.

Irrespective of questions of definition, low energy prices have resulted in real economic costs, both in energy importing and exporting countries. These include an inefficient allocation of resources; exceptionally low levels of energy efficiency; high and rapidly rising levels of fuel and electricity consumption both in absolute and per capita terms; and in some cases decade-long underinvestment in domestic energy sectors. In terms of their impact on poverty alleviation, a high share of energy subsidies has been shown to be captured by higher income groups and industries. While energy subsidies do hence benefit low income households, they must be seen as a costly and inefficient tool to protect the poor in the Arab world. The financial resources committed to energy subsidies are funds which could have been spent on other pro-poor expenditure items such as education and health services, or targeted social security programmes.

Nevertheless, the reform of domestic energy pricing frameworks remains an economically and politically challenging task. The social and economic costs of unmitigated subsidy reforms can be large, not last in view of making poverty levels more severe, and lessening social protection for the poorest parts of society. Politically, rising energy prices, alongside increased prices for food and other essential goods, are sensitive and can provoke large-scale protests. The most recent wave of political uprisings in different parts of the Arab world has already impacted the pace and direction of some of the tentative price reforms that have taken place in the region in the past few years. Both Jordan and Lebanon revised their energy prices downward in the response to popular pressure in the first half of 2011, contrary to both countries' original plans. Syria, at the time of writing, is engaged in political domestic conflict, with its original plans to further the country's pricing reform seemingly abandoned for the time being. In Egypt, the November 2011 parliamentary elections have, at the time of writing, not resulted in political stability, raising questions over the relevance of revising energy pricing policy as an immediate policy priority.

It is most probable that the political climate resulting from the 2011 Arab uprisings will increase the political adversity facing many Arab governments pursuing painful economic reforms, including the reform of domestic energy prices. This expectation has perhaps been expressed most clearly in a recent, unusually emphatic statement by Moroccan authorities in a recent IMF consultation paper, that 'subsidy reform will be politically difficult.'[141] Consequently, making policy recommendations becomes an increasingly difficult task in the context of the current political turmoil in the region.

Even so, some limited reform success in parts of the region in recent years shows that the reform of energy subsidies can be feasible in the Arab world. Countries such as Jordan, Lebanon, Syria, and Tunisia raised energy prices in response to the 2008 oil price hike, with Jordan, Lebanon, and Tunisia cementing the reform, at least temporarily, into automated price adjustment mechanisms. Both Jordan and Syria combined their price revisions with the reform of their social security systems to compensate for, and partially replace, benefits previously distributed in energy subsidies. Perhaps as an important precedent for the region's energy exporters Iran, the Arab world's close neighbour, recently reformed its own domestic pricing regime to an extent unseen so far in the region. This reform, which couples reductions in fuel and electricity subsidies to the distribution of universal cash transfers, has so far been received largely positively, both domestically and by international institutions; and it suggests that the reform of subsidies coupled to effective compensatory schemes can proceed with little political protest, and with manageable macroeconomic consequences.

[141] IMF (2011a, 9).

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