



Viewpoint

Fossil fuel subsidy removal and inadequate public power supply: Implications for businesses

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ABSTRACT

We briefly consider the impact of fossil fuel subsidy removal policies in the context of inadequate power supply, with a focus on the implications for businesses. In doing so, we utilize the case of the early 2012 fuel subsidy removal in Nigeria. The rationale for such subsidy-removal policies is typically informed by analysis showing that they lead to an economically inefficient allocation of resources and market distortions, while often failing to meet intended objectives. However, often the realities of infrastructural and institutional deficiencies are not appropriately factored into the decision-making process. Businesses in many developing countries, already impaired by the high cost of power supply deficiencies, become even less competitive on an unsubsidized basis. We find that justifications for removal often do not adequately reflect the specific environments of developing country economies, resulting in poor recommendations – or ineffective policy.

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1. Happy new year

On January 1st 2012 Nigerians woke to discover that the Petroleum Products Pricing Regulatory Agency (PPPRA), the price regulatory body under the Nigerian National Petroleum Corporation (NNPC), had overnight, and with little signal, more than doubled the price of gasoline, completing the liberalization of the downstream sector of the oil industry that commenced on January 1st 2002. President Goodluck Jonathan has since revised his decision by reducing gasoline prices by 30 percent, which led to the end of a week-long nationwide strike led by trade and labor unions.

The government had lamented the enormous financial burden of the subsidy, valuing it at about 30 percent of total federal government expenditure and 4 percent of national income. It estimated that removing the subsidy would save it \$8bn annually. This case starkly illustrates the complex interactions between issues such as: social development, labor unions, public infrastructure development, governance, the use of fossil fuel revenues, the role of national oil companies and private sector oil majors, impacts on the health of the manufacturing sector, business development, energy security, and energy poverty. Nigeria has long been a focus of this broad nexus in West Africa – and globally.

To a large extent, many agree that such a subsidy removal is a 'good' policy poorly executed. In the long-run it is economically

unsound for an oil producing country to export raw petroleum to countries that refine it and then subsidize re-importation of the refined product – as this loosely translates into creating production facilities and creating jobs abroad while 'importing' unemployment. The government has equally emphasized the reluctance of private foreign investors to invest in local refineries as the controlled price is not attractive enough, arguing that the deregulation of the gasoline market will therefore attract private investors into the sector, and in the process lead to a reduction of petrol prices as raw petroleum will be domestically refined.

Still, some accolades from the international community applauding the belief that the funds from the removal of the subsidy would contribute to rapid infrastructure development do not appear to be completely in line with the realities of government budget negotiations and revenue hypothecation, or with the governance record of the Nigerian government¹.

2. Context

Fossil fuel subsidies for consumers have been used by developing country governments principally as a means of achieving certain social, economic, and environmental objectives. They

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¹ Over the past few years Nigeria has scored around 2.4 out of 10 of Transparency International's Corruption Perception Index (CPI), ranking 143rd out of 182 in 2011. The World Bank Governance Indicators paint a similar picture, with Nigeria scoring – 1.2 on a scale of – 2.5 (weak) to 2.5 (strong) in the category Control of Corruption.

include: alleviating energy poverty and improving equity, increasing domestic supply, redistributing national resource wealth, protecting domestic production and associated employment, correcting externalities, and controlling inflation. In recent years, there has been a wave of subsidy-removal efforts. Many countries already have, or are currently preparing to, phase out fossil-fuel subsidies. As an example, in 2009, and 2010, G-20 and APEC leaders committed to, “rationalize and phase out over the medium term inefficient fossil fuel subsidies that encourage wasteful consumption” to both producers and consumers (IEA, 2011; Koplow, 2010). Iran implemented reforms to energy subsidies in December 2010, increasing the price of petroleum products by between 230 percent and 840 percent. In 2011, El Salvador raised the price of previously subsidized LPG cylinders. Indonesia is planning to curb spending on energy subsidies by 40 percent in 2013 and eliminate them by 2014². The burden of fossil-fuel subsidies on public finances, the inequitable distribution of subsidies, and the encouragement of wasteful consumption in many countries has been a strong motivation for such reforms, but there is still uncertainty as to the progress towards a complete phase-out – or the ultimate results of such an ambition.

The case of the recent (Q1, 2012) Nigeria fuel subsidy removal clearly demonstrated how difficult such an aspiration is to implement in practice. It highlighted how subsidies create deeply-rooted interests among domestic industries advantaged by cheap energy inputs (and those income groups that are accustomed to receiving this form of economic support) (Victor, 2009; IEA, 2011). As even maintaining current levels of access to modern energy services crucially depends upon cheap fuel prices in many developing countries, such moves have previously been met by strong opposition in the form of nation-wide strikes and protests³. While most public discourse about fuel subsidies has focused on the impact on the poor (e.g., Gangopadhyay et al., 2005; Narasimha, in press; Dube, 2003; World Bank, 2010; IEA, 2010, 2011; IEA et al., 2010; Adam and Lestari, 2008; Mourougane, 2010), we consider the impact on businesses.

A firm's decision on how much energy to consume is strongly linked to energy prices. Therefore, fossil-fuel consumption subsidies (resulting in artificially low fuel prices) can encourage the development of energy-intensive industries that become uncompetitive globally on an unsubsidized basis (IEA, 2011). In fact, as illustrated in a study by Clements et al. (2007) on effects of oil-subsidy reform in Indonesia, the increase in petroleum prices has ripple effects on production costs and incomes in the economy⁴. The impact of phasing out energy subsidies on a firm's output depends, at least partly, on energy cost shares of production. While one might argue that, with the exception of energy-intensive activities (metal and non-metallic products, pulp and paper, etc.), energy costs in most industries are relatively low (IEA et al., 2010; UNIDO, 2011)⁵ – according to UNIDO, average energy cost ratios range from 1.4 to 5.6 percent for discrete product sectors in developing countries – this premise becomes less compelling in the context of an electricity-constrained economy where firms bear the heavy financial burden of public power supply deficiencies. According to some estimates, for example, the cost of private power supply amounts to 36 percent of production costs in Nigeria (Okafor, 2008). The results of a survey conducted

by Eifert et al. (2008) provide some detail by country in terms of a breakdown of indirect costs of doing business, with energy consistently representing the largest component. Energy costs range from 10 percent in Eritrea to 59 percent in India. This emphasizes the need to take into consideration the context in which subsidy reforms are undertaken, with particular regard to infrastructural facilities and the importance of choosing adequate accompanying policies to avert adverse impacts.

The principal motivation for the expansion of access to electricity to businesses (and households alike) in an energy-constrained environment is to create wealth (or the necessary conditions for it to expand). Improving infrastructure endowments has large benefits to firms' transaction costs and marginal rate of return to capital investment (Lin, 2009). Thus, restricting the ability to access these very services by increasing already high costs (through subsidy removal) without providing any increase in quality of supply or other services acts to the detriment of local businesses. In order to shield the business community (or other 'productive sectors') from adverse impacts of fuel subsidy removals, it is imperative that such steps go hand in hand with power sector reforms. We argue that expanding energy infrastructure should be one of the chief elements in fuel subsidy reform in affected countries; and is a clear area in which to hypothecate funds due to the catalytic role it plays in an economy.

Given that the question of fuel subsidy removal/reform is being faced by countries across the globe, an improvement of reform regulation and policy is essential. The suitable combination of policies accompanying the subsidy removal is context-specific and will vary from country to country; still some principles will remain nearly universal.

3. International perspectives

The International Energy Agency (IEA) estimates that fossil-fuel subsidies to consumers worldwide amounted to \$312 and \$409 billion in 2009 and 2010, respectively (IEA, 2010, 2011). Consumption fuel subsidies benefit consumers because they artificially reduce end-user prices for fossil fuels, thereby helping to alleviate poverty, redistributing national (resource) wealth, or promoting economic development by supporting energy-consuming industries. In fact, the primary objective behind fuel subsidy policies in many emerging economies has been the promotion of industrialization. Examples are Nigeria (Adenikinju, 1998) or Brazil (De Oliveira and Laan, 2010), who's key objective in maintaining low energy prices was the desire to facilitate industrialization as energy was expected to be cheap and abundant to confer an advantage on domestic energy-consuming industries.

However, while these objectives are well-intentioned, it is widely acknowledged that fuel subsidies tend to engender excessive energy use, resulting in an inefficient allocation of (public) resources. The call for the removal of fuel consumption subsidies among both developed and developing country governments has become increasingly louder in recent years for several reasons. On a global level, artificially low fuel prices in key markets have led to low demand response to international oil price changes. Domestically, soaring oil prices have turned fuel subsidies into an unsustainable financial burden to governments. In addition, fuel subsidies for consumers adversely impact investment sources as low consumer prices render investments in the energy sector unviable. Other unintended consequences include the encouragement of fuel adulteration and smuggling, harmful environmental effects of over-consumption, and a disproportionate benefit to higher-income/larger consumers compared to the low-income consumers they were intended to target (Victor, 2009; IEA, 2010).

² For more details see IEA, 2011.

³ For more examples of civil unrest in connection with subsidy reform see World Bank, 2012.

⁴ Clements et al. (2007) use a computable general equilibrium (CGE) model to assess how increases in petroleum prices and incomes throughout impact different sectors of the Indonesian economy.

⁵ Refer to (UNIDO, 2011) for an overview of share of energy costs in total industry input costs across country groups and by sector.

Consequently many governments have moved to phase out fuel subsidies and have vowed to use the freed-up resources in a more efficient way. In Nigeria, for example, the savings to be accrued through the subsidy removal would be invested in such areas as infrastructure, health and education via the newly conceived Subsidy Reinvestment and Empowerment Program (SURE). In Iran, the government had started making cash payments to its citizens prior to the removal; about 90 percent of the population continue to receive monthly payments (bank accounts were opened for heads of households to receive government compensation payments)⁶.

At the same time subsidy phase-out programmes are expected to lead to a reduction in energy demand that should result in less volatile energy prices on global markets and have positive implications for energy security (IEA, 2011) – although the causality here is difficult to establish. The question is whether a reduction in energy demand is desirable in the context of a particular country. A developing economy crippled by erratic power supply, for instance, is more exposed to the negative impact of subsidy removals simply because they would aggravate the already substantial cost-burden of public power supply deficiencies at a time when it needs to dramatically build-up its economy.

4. Industrialization is not a dirty word

There is a general consensus that adequate infrastructure services supply is essential for growth and economic development⁷. Electricity supply plays a leading role in this effort considering the historical pattern, which has been for economies to develop through a path of industrialization, thus shifting from a subsistence economy to a manufacturing economy, (and to become more services oriented once a certain level of income is reached). Hence, for a subsistence economy to be able to 'take off' into the phase of industrialization, or to move to the *investment-driven* stage, it requires basic infrastructural facilities, such as electricity supply, to be in place (Önsel et al., 2008; Lin, 2009; Rodrik, 2004). As explained by Rosenberg (1998), it was electricity that made possible the transition from small scale batch production to continuous processing in the refining of petroleum products or in the paper industry, during the United States' 'Second Industrial Revolution'⁸. Eventually, those continuous processing technologies became standard technologies in a large number of industries committed to bulk material manufacturing.

Firms in countries with severe public power supply deficiencies are forced to install their own generating equipment to shield themselves from the effects of power outages, which inevitably increases production costs. This is why the quality of electricity supply is an important determinant of the business environment. In fact, power supply irregularities constitute a major burden to business activities across developed and developing countries (see Dethier et al., 2008; Iimi, 2008). Firm costs rise significantly with the frequency and average duration of electricity outages due to the high cost of private power provision, which is aggravated by fuel subsidy removals. The establishment,

operation and maintenance of private generating facilities is expensive; they dissipate capital that could be used for more productive investments (Okafor, 2008; Steinbuks and Foster, 2010). According to Steinbuks and Foster (2010) companies' own power generation accounts for up to 20 percent of installed capacity in Nigeria and 6 percent across sub-Saharan Africa. This makes it important to study the impact of subsidy removal on capabilities on the micro level.

Consider the serious operational difficulties businesses in the Nigerian economy have been facing in light of its ailing power sector. The dominant fuel consumed in the power-intensive manufacturing sector is Automotive Gas Oil (AGO), i.e., diesel⁹, whose market has already been deregulated in Nigeria. Private costs of infrastructure deficiencies are substantial¹⁰ and have constantly been on the rise over the past couple of years especially due to the removal of the diesel subsidy, which led to a dramatic increase of the pump price for diesel from \$0.19/l in 2002 to \$1.13/l in 2008 (Adenikinju, n.d.). The cost of buying generators, maintaining them and buying diesel to run them in response to the epileptic power supply from the state-owned Power Holding Company of Nigeria (PHCN) has simply become unsustainable in a country where, according to the World Bank, firms experience an average of 27 power outages with an average duration of 8.2 h in a typical month (World Bank, 2012). According to Okafor (2008) some industries receive as little as 4.5 h of power a day, and the highest daily level in any region is 12.5 h.

Not surprisingly, a recent survey of manufacturing firms in Nigeria showed 82.7 percent of respondents identifying electricity as their number one problem¹¹. Figures released by the Manufacturing Association of Nigeria (MAN) indicate that the cost of generating power supply with diesel generator-sets for firms in Nigeria accounts for about 36 percent of production. Due to substantial losses incurred as a result of power supply constraints, roughly 30 percent of all manufacturing industries had shut down as of May 2007 and 60 percent were ailing; only 10 percent were operating at a sustainable level (Okafor, 2008).

It is gasoline, though, that provides the bulk of total demand of petroleum products in the country. Its share has increased from 36 percent in 1977 to 71 percent in 2006. A recent study on Nigeria's energy demand function reveals the significance of price in the demand for petroleum products in Nigeria and shows that demand for gasoline is least responsive to price increase among them (Iwayemi et al., 2010). A 10 percent increase in gasoline price in Nigeria would lead to a reduction in demand for gasoline by only about 2.5 percent. Consequently, the price hike would lead to an increase of aggregate expenditure on petrol while shrinking potential domestic consumption, implying a reduction in sales for businesses.

Gasoline is used in Nigeria particularly by small enterprises for transportation services and for fueling (smaller) private generator sets. Thus, a significant gasoline price rise will have negative implications for the birth and growth of small firms. As in most emerging economies, small (and medium) enterprises in Nigeria serve as major employers of labor and contribute significantly to economic growth and development (98 percent of all enterprises are SMEs, employing about 60 percent of the working population (ECA, 2010; CBA, 2003). In addition, Nigeria does not have a fully functioning mass transit system and people rely on a system of minibuses, taxis and motorbikes, all run as private businesses, all of which pass the additional costs of the sharp increase in petrol

⁶ For more detail see IEA (2011).

⁷ Lin (2009) explains that countries at different stages of development tend to differ in terms of economic structures due to differences in their endowments. Similarly, Isaksson (2009) finds that energy infrastructure helps explain both varied stages of industrialization and differing industrial growth rates across countries in an economically meaningful way. This strongly underlines the importance of the electricity infrastructure for the process of industrialization in developing countries.

⁸ Electric power is considered as a key player of the so-called 'Second Industrial Revolution', which took place between around the last quarter of the 19th century and the beginning of the 20th (Rosenberg, 1998).

⁹ Diesel is primarily used to fire industrial plants and to transport heavy goods and commodities (Adenikinju, 1998).

¹⁰ According the MAN, its members spend about \$303 million for both maintenance of generators and purchase of diesel annually.

¹¹ See <http://www.manufacturersnigeria.org/>.

prices on to consumers, including owners of mainly small businesses.

This situation reduces cost competitiveness of local production, in countries least equipped to deal with such a disadvantage. Due to major deficiencies of publicly-provided power in Nigeria, for example, firms face most competition from suppliers in South and South-East Asia. Take as an example the cost of production of a box of 96 *Paracetamol* tablets. A firm interview conducted in the course of Nigeria Firm Survey by the World Bank revealed that production of *Paracetamol* tablets had to be stopped when the cost of production at N45 was N7 higher than in India (N38). Estimations showed that if the firm enjoyed the standard of Indian electricity supply, its production costs at N36 would be even N2 lower than in India (Tyler, 2002). This case gives an idea of how the sudden removal of fuel subsidies can aggravate the impact on local businesses of poor public power infrastructure in the absence of alternative remedies.

5. The rapture of decreasing demand

Many commentators cite the energy security benefits that accrue from the reduction in energy consumption through subsidy removal programs. The IEA stipulates that removal of fossil-fuel subsidies will incentivise consumers to use energy efficiently, resulting in a reduction of energy consumption and energy-related GHG emissions (IEA, 2011). Lower demand, in this line of reasoning, would lead to less important dependence and expenditure in net-importing countries and would boost export availability and earnings in net-exporting countries (IEA, 2011; Birol et al., 1995). However, as discussed briefly, the reduction in demand in response to higher prices is likely to shrink firms' cost competitiveness, particularly in power-constrained economies. Can affected businesses then be expected to resort to a more efficient use of energy?

In fact, there is reason to believe that it is rather unlikely for businesses in electricity-constrained environments to use energy more efficiently in response to subsidy removal. The results of a survey recently conducted by UNIDO found that one key barrier to improving industrial energy efficiency in developing countries is unreliable energy supply since it encourages firms to invest in expensive and inefficient standby power systems (UNIDO, 2011). Overall, the study found that many developing country governments regard energy conservation as a sort of luxury, and therefore have shown little interest in the topic.

This implies that industrial energy-efficiency measures are not regarded as a 'first-stop' means of reducing production costs; one possible interpretation being that any potential savings realized through industrial energy-efficiency projects would hardly compensate for the massive losses incurred as a consequence of inadequate power supply (UNIDO, 2011). In light of these findings and given that the cost of power supply deficiencies would significantly increase in case of subsidy removal, it remains doubtful whether a reduction of fuel demand is all that beneficial to economies already crippled by power-supply deficiencies.

6. Conclusion and policy implications

International calls for the removal of fossil fuel subsidies for reasons ranging from market distortions to impacts on climate change and clean energy development have been common and increasing over the last two years. But simplistic rhetoric that assumes that the vast quantities of money used for these subsidies can quickly and effectively be diverted to internationally-determined priority areas are not useful. History has

repeatedly shown the complex political terrain associated with increasing the price of fuels – from Venezuela to Bolivia to Jordan, Indonesia and the USA.

One benefit of subsidy removal is believed to be its influence on reducing energy demand and more efficient use of energy. However, a reduction in energy demand in response to higher prices is likely to shrink firms' cost competitiveness in severely power-constrained economies. In addition, research shows that the more efficient use of energy by businesses is less likely to occur in response to price hikes in those economies.

Nevertheless, the point made here is not that fuel subsidies should be maintained indefinitely in an effort to sustain/improve cost-competitiveness in (power-constrained) developing countries. Rather, we emphasized the importance of taking into consideration structural features peculiar to developing countries when analyzing the question of fuel subsidies. Any country seeking to explore the removal (or decrease) in its fossil fuel subsidies needs to put key building blocks in place prior to such measures, and carefully measure the tempo of such changes, in order to ensure that increasing access to high-quality energy services is not impeded by means of reducing its affordability. This is in line with Victor (2009) who argues that serious reforms involve not only reducing subsidy demand but also augmenting the government's ability to put in place alternative policies that would be more cost-effective. Measures such as improving and expanding power (and refinery) infrastructure and improving governance in the functioning of government would support such a transition. Alternatively, subsidizing certain special industries¹² may be another viable option. There are means by which subsidy removal policies might be enhanced so as to avert adverse impacts on the business community – but they are country and issue specific, require careful analysis, and have to be undertaken with well-formulated goals in mind.

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¹² E.g., India has subsidized electricity and diesel used for pumping and tractors sold to farmers for food security (World Bank, 2010).

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