

# Are we serious about our energy security?

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## 1 Introduction

In his New Year message, Prime Minister Manmohan Singh outlined energy security as one of the five key challenges facing the country. While this is indeed true, unfortunately, the Government response to this challenge has been very weak and inadequate. Fuel price reforms and enhancing nuclear capacity are the most discussed options to address the energy security challenge. Though merits and de-merits of these options could and should be debated, there are several other options which have been languishing for want of any firm actions. This short article first presents the magnitude and importance of the challenge, and then narrates how inadequately the Government has responded to it.

## 2 India's energy security

We expand the definition of energy security as given in India's Integrated Energy Policy (Planning Commission, 2006) to not only include the ability to reliably access requisite quantity of energy at a reasonable cost and provide clean, modern energy access to the entire population<sup>1</sup>, but also that the production and end-use of energy should have minimal health and safety hazards. In this paper, we focus on the threat to energy security from very high external dependence as it increases uncertainties of price and availability of energy, particularly in view of increasing resource nationalism around the world.

India's net<sup>2</sup> imports of energy (petroleum, coal and gas) increased from 129 mtoe (million tons oil equivalent) in 2006 to 191 mtoe in 2010 representing a growth of 10% p.a. This is likely to increase to about 227 mtoe in 2011-12. Supply and demand projections for the 12<sup>th</sup> five year plan indicate that imports will further grow to about 366 mtoe in 2016-17 (Figure 1). That is, the country's energy imports would nearly triple in just over a decade from 2006.

Such a rapid increase in imports also implies a significant financial burden on the economy. At current prices, the total energy import bill for 2011-12 is likely to be about Rs. 5.4 lakh crores (USD 108 billion) – approximately equal to the state GDP of Gujarat. In other words, India currently writes a cheque of about for Rs. 1,480 crores every day for its energy imports.

Real prices of petroleum, coal and LNG increased at 5% (in spite of the recession), 12% and 7% p.a. respectively between 2000 and 2010 and the reference scenario of IEA's international energy outlook assumes that real oil prices would increase at 5% per year until 2020 (BP, 2011; PPAC, 2012; IEA, 2011). Though IEA oil price projections are known to be conservative (Miller, 2011), even if one assumes that

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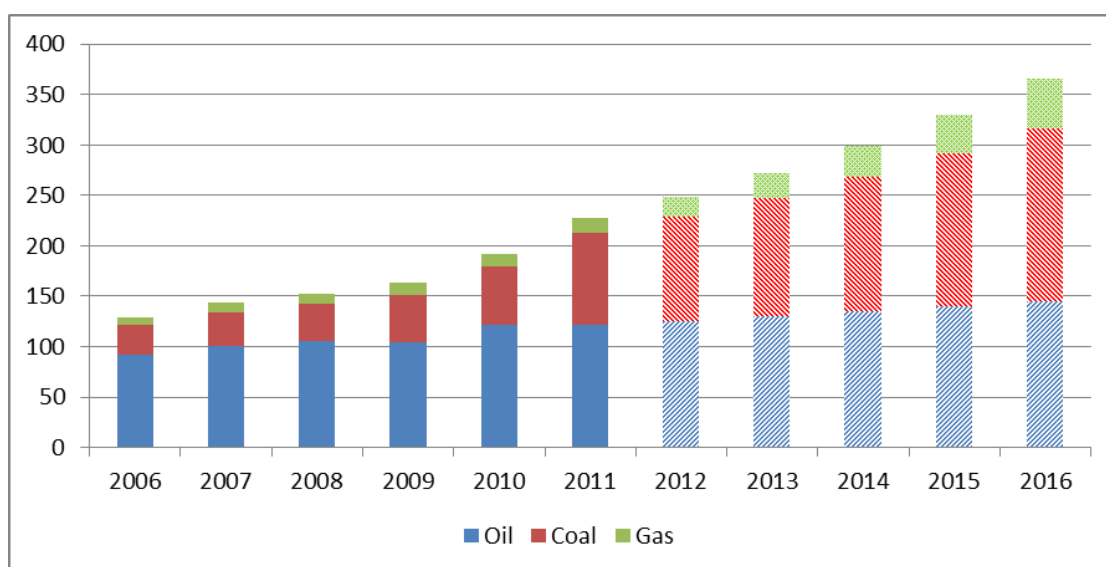
<sup>1</sup> This is particularly important in a country like India where about 300 million people still do not have access to electricity and over 50% of the population uses firewood and chips for cooking (NSSO, 2008).

<sup>2</sup> India and other countries are often both importers and exporters of fuels. Unless otherwise mentioned, all figures in this paper refer to net energy or fuel imports, i.e. after deducting exports from imports.

real prices of all fuels increase at only 5% per year during the 12<sup>th</sup> five year plan, the total import bill would increase from 108 billion USD to 196 billion (constant) USD by 2016-17 – an annual increase of 13% per year. This implies that energy imports would go up from about 6% of GDP in 2011-12 to about 7% in 2016-17, even if GDP grows at 9% per year (Figure 2)<sup>3</sup>.

**Figure 1: India's energy imports in million tons oil equivalent<sup>4</sup>**

**Source: (EIA, 2012; PPAC, 2012) and Prayas calculations**

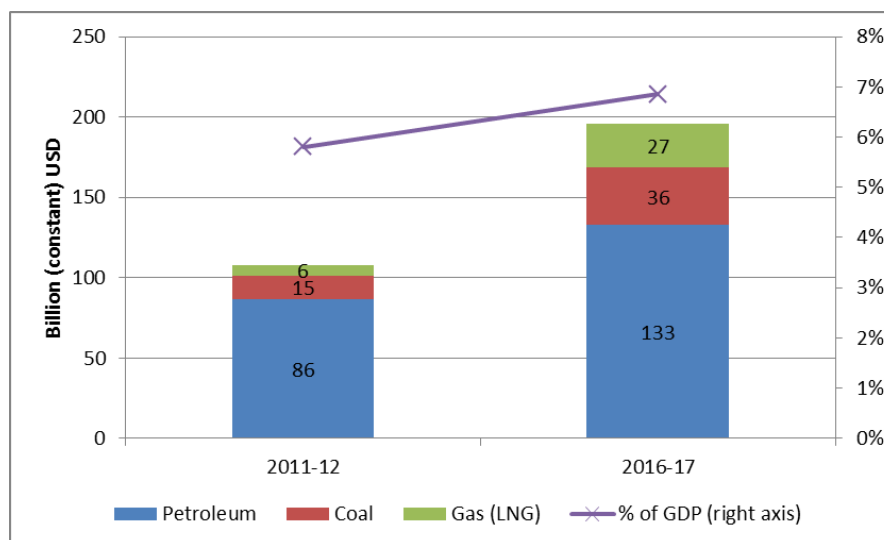


**Figure 2: Financial impact of projected energy imports**

**Source: (BP, 2011; PPAC, 2012) and Prayas calculations**

<sup>3</sup> Going beyond 2016-17, both import quantities and prices may move in either direction. For example, increasing climate change induced pressure and falling reserves may result in higher prices for fossil fuels, though falling prices of renewables may reduce demand for conventional fuels. Similarly, India's energy intensity may come down when its infrastructure building plateaus out – though that may be 15 or more years into the future.

<sup>4</sup> The shaded bars represent future projections. Though future projections are for financial years, they are shown as calendar years in the graph for simplicity.



### 3 International comparison

India's energy imports form a considerably higher proportion of its GDP compared to many other countries (Figure 3). In 2008, India spent 7.3% of its GDP on energy imports, while Germany and Japan – whose energy import dependence is about 75% and 95% respectively, as against only 33% for India – spent only 3.3% and 4.4% of their GDP respectively.

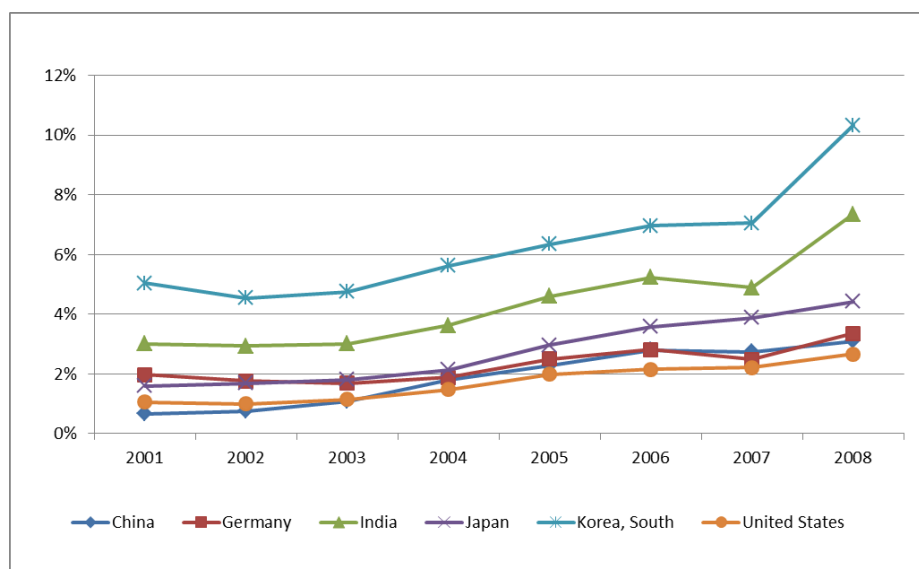
India's high level of energy imports also contributes significantly to its trade deficit: net energy imports are responsible for over 60% of the country's trade deficit, and gross energy imports contribute to about a third of the total import bill. All other countries studied, except USA, run trade surpluses and hence energy imports do not impact their trade balance too adversely, while they form only 40% of even USA's trade deficit (ITC, 2012).

**Figure 3: Net energy imports as share of GDP<sup>5,6</sup>**

**Source:**(EIA, 2012; WorldBank, 2012; BP, 2011)and Prayas calculations

<sup>5</sup> We use nominal GDP figures because imports are paid for at actual prevailing exchange rates and our focus is on macro-economic impacts such as growth and balance of payments.

<sup>6</sup> The import percentage for 2008 is higher than 2011-12 due to the steep spike in energy prices in 2008 which resulted in higher energy import cost for all countries.



## 4 Implications

Such high expenditure on energy imports has many negative implications on the country's development:

1. **Energy access to the poor:** High dependence on imports leads to higher energy costs. Higher costs, compounded by an inefficient subsidy delivery mechanism, make it hard to provide modern, clean energy access to the country's poor.
2. **Increased vulnerability:** India would be more vulnerable to geo-political tensions and domestic policy changes in exporting countries. Recent examples include oil price increases due to rising tensions around Iran and the intense debate surrounding the increase in imported coal prices due to regulatory changes in Indonesia and Australia.
3. **Lower GDP growth:** High imports are a drain on the country's foreign exchange and impact domestic growth. For example, if India could reduce energy imports to about 5% of GDP in 2016-17 and invest the 2% saved domestically, it could result in additional GDP growth of about 0.5%<sup>7</sup>.
4. **Exchange rate:** Fuel imports form the largest item in the country's import basket and contribute to more than half the country's trade deficit. This not only affects the country's balance of payments but also weakens the rupee against other currencies, making imports even more costly.

## 5 Government response

It is clear that energy security is a serious challenge faced by the country, with severe developmental and financial impacts. There could be many responses to this challenge, with demand side measures to improve end use efficiency and curb unproductive demand as the first priority followed by improving supply side efficiencies. Unfortunately, the Government's response has been weak on both these counts.

<sup>7</sup> Data from the Ministry of Finance for 2009-10 indicate that the Incremental Capital Output Ratio for India is over 4. So, approximately 4 units of investment lead to 1 unit of output.

1. **Weak institutional response:** The Prime Minister set up an Energy Coordination Committee to deal with energy security and other energy sector issues as far back as 2005 (PIB, 2005). Though this committee was constituted with good intentions such as formulating “a coordinated policy response cutting across ministries so as to improve the overall energy scenario in the country while addressing energy security concerns”, there has been no visible action from this committee even as the energy crisis has gradually worsened, as indicated by stagnating coal production, falling domestic production of gas, sharply rising imports and deterioration in the financial health of power distribution companies.

Robust and reliable data must be the bedrock of any policy formulation. However, there have been discrepancies in data from multiple official sources, such as discrepancy between oil usage and transport activity data, and about 15% discrepancy in coal usage data (Planning Commission, 2011). The lack of a responsible agency for basic tasks such as reliable data collection and reconciliation is another indicator of weak institutional response.

2. **Insufficient attention to burgeoning oil consumption:** Petroleum imports contribute to about 80% of the energy import bill (Rs. 4.3 lakh crores in 2011-12) and about half the petroleum consumption in the country is for transport. Therefore, demand side measures in transport should have been a key measure to tackle the country’s energy security. However, there has been very little proactive action on this, though automobile sales in the country have been increasing at a rate of about 12% p.a., and consumption of petrol and diesel have been increasing at a rate of about 8% p.a. (SIAM, 2012; PPAC, 2012).

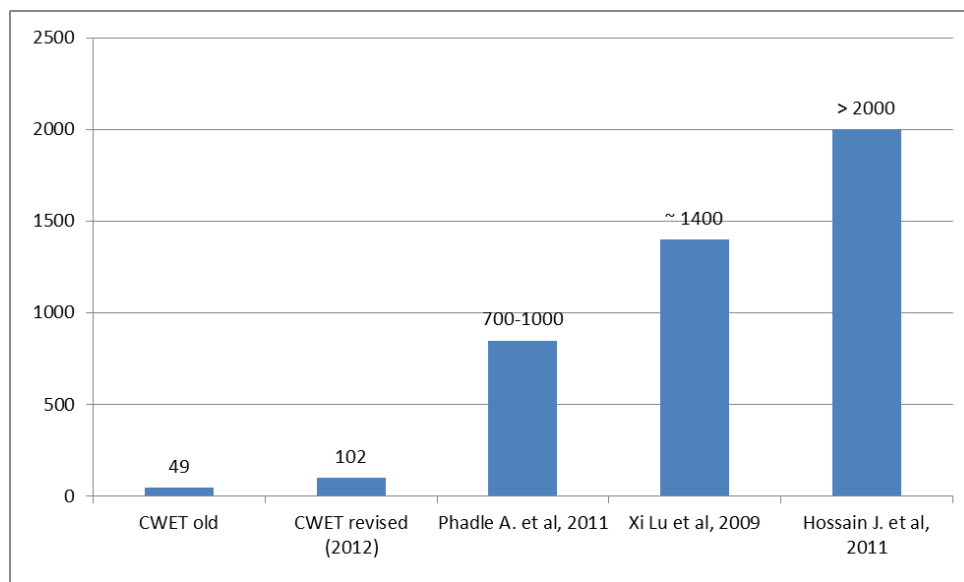
No norms have been notified for vehicle fuel efficiency though the issue has been debated and disputed for over four years now (Sethi, 2012). Though public and non-motorized transport are more efficient than private transport and the National Urban Transport Policy prioritizes them, the Government’s own JNNURM program has sanctioned about six times more projects for roads, flyovers etc. than public transport, though the former primarily benefit private transport (JNNURM, 2012)<sup>8</sup>. Similarly, though railways are considerably more energy efficient than road or air, the National Highway program has been aggressively pursued while railway programs such as the Dedicated Freight Corridor and high speed rail corridors languish.

3. **Inadequate assessment of wind energy potential:** Renewable energy sources will have to play a big role in securing India’s energy future, and an important step in this process is to obtain a realistic estimate of the potential from different sources. Though the Government set up the Centre for Wind Energy Technology (CWET), there has been no urgency or initiative to comprehensively assess and update the country’s wind energy potential. CWET’s original estimate of Indian wind energy potential was 45 GW, which was upgraded to about 100 GW only after three independent reports upgraded India’s wind energy potential by an order of magnitude (Figure 4).

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<sup>8</sup> This is without considering other demand side policies such as road pricing and limiting automobile licenses that have been implemented in cities such as Singapore, London and Shanghai.

**Figure 4: Different wind energy potential estimates for India**  
**Source: (Phadke, Bharvirkar, & Khangura, 2011; Lu, McElroy, & Kiviluoma, 2009; Hossain, Sinha, & Kishore, 2011)**



4. **Neglect of the coal sector:** More than five years ago, a Government appointed expert committee gave many recommendations to improve the coal sector such as detailed mapping of the country's reserves using latest techniques, restructuring Coal India Ltd., replacing loose linkages with formal contracts, and setting up a coal regulator (MinistryOfCoal, 2005; MinistryOfCoal, 2007). None of these recommendations have been implemented even as domestic production has stalled and coalimport dependence has reached 20% though the country is supposed to be rich in it. Instead, quick-fix solutions such as asking CIL to enter into legally binding contracts with power suppliers are suggested (PIB, 2012) without sufficient clarity about its implications (Krishnan, 2012; Chand, 2012).
  
5. **Inefficiencies in the gas sector:** The share of gas in the fuel basket is growing around the world and in India. However, many inefficiencies in the sector have remained unaddressed. The Government response to the controversies surrounding the KG D6 basin, such as falling gas production, adverse CAG report and alleged non-compliance of contractual obligations by the operator, has been indecisive. The gas utilization policy continues to focus on sectoral priorities rather than on efficiency of end use and promoting applications such as distributed Combined Heating and Power. On the supply side, progress of international pipelines such as the TAPI pipeline has been very slow, and roll-out of city gas distribution (CGD) networks is well behind schedule. Though over 100 CGD networks were to roll out by 2013, only 19 have been authorized thus far, and progress of even these is suspect (BusinessStandard, 2008; PNGRB, 2012).

## 6 Conclusions

The above discussion highlights the insufficient appreciation and understanding of the seriousness of the energy security problem and its impact on the country's development. It also shows how the Government response to the challenge has been highly inadequate with actions falling far short of intentions.

This has led to various crises in the energy sector, which in turn, prompt ad-hoc emergency responses without addressing the underlying fundamentals. In contrast, dealing with this problem requires a holistic and long-term approach backed by institutional and policy responses. It should also be a continuous and on-going process, rather than a one-time response. In the absence of such a systematic approach, the country's future may literally be dark.

## 7 Acknowledgements

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