

## Understanding the energy elephant

Modern energy such as electricity or petroleum products or any other plays a crucial role in enhancing quality of life and driving an industrial economy. People's lives are enriched through energy-based conveniences such as electric lighting, household appliances and motorized transport. Energy is an important input to most enterprises in the industrial and service sectors, and thus important from the economy's perspective.

However, energy also has a darker side to it. Deteriorating urban air quality, much of which can be attributed to motorized transport, has gained wide attention recently. There are also significant social and environmental concerns (such as air and water pollution, deforestation and displacement) around energy-related activities such as coal mining and power generation. Subsidies, particularly untargeted subsidies, on petroleum products and electricity are often criticized for their fiscal imprudence and promotion of inefficient consumption. Energy related emissions are the largest contributor to climate change and India is under increasing pressure to take action in this regard as the date for the Paris climate summit approaches.

Therefore, to truly understand the energy sector, it is necessary to have a method to objectively measure both the "Dr. Jekyll" and the "Mr. Hyde" aspects of it. As in the fable of the blind men and the elephant, it would be inappropriate to try to understand the energy sector by considering only one of these multiple positive and negative facets, as doing so will result in a distorted perception of the sector. On the other hand, measuring and tracking the various facets *together* can help to identify weaknesses and design policies that maximize the "good" and minimize the "bad".

A "dashboard" proposed in a recent paper by Prayas (<http://goo.gl/cJ3CFP>) is intended to help in such measurement. It accounts for the positives and negatives of the sector by considering five separate dimensions – consumption, supply, environmental impacts, social impacts and economic impacts. Each dimension consists of two indicators and most indicators require a single data point while few require two data points adding up to 13 data points totally. Most of the required data is available from public sources making it easy to compute the dashboard regularly. Examples of indicators include the share of population consuming a minimum threshold of modern energy, air pollution levels near energy projects, the share of those displaced by energy projects that have been satisfactorily rehabilitated and the country's energy import exposure and impact on trade balance.

An application of the dashboard to the Indian energy sector in three years, 2004-05, 2008-09 and 2012-13, reveals some interesting insights (see accompanying table – details of calculations available in the paper).

Firstly, though the scores for modern energy consumption have improved over the years, the scores are still quite poor – particularly when it comes to use of modern energy in cooking and rural enterprises. Secondly, India's energy import exposure is increasing rapidly with about a third of our energy being imported increasing the geo-political as well as price risks of our energy system. Thirdly, it is unfortunate that even though land is such a politically sensitive topic in India, there is no systematic data collected about the number of people displaced by various projects and subsequently rehabilitated. Finally and most damningly, India's environmental management systems are completely broken with average RSPM levels in the vicinity of energy projects consistently well above prescribed norms and levels of chemical pollution (NO<sub>x</sub> and SO<sub>x</sub>) also steadily getting worse.

These findings clearly indicate that there is a need to focus policy action on rapidly increasing access to electricity and modern cooking fuels, having a much more effective and functional environmental management system, reducing energy import exposure and instituting data collection systems for social impacts of energy projects.

Dimension	Indicator	Score (out of 100)		
		2004-05	2008-09	2012-13
<b>Consumption</b>		25	29	33
	Household modern energy consumption above threshold	29	36	44
	Modern energy use in rural enterprises	21	22	23
<b>Supply</b>		54	50	46
	Net energy import exposure	78	73	67
	Sustainability of energy supply	31	27	24
<b>Social</b>		27	33	38
	Rehabilitation of those displaced	NA	NA	NA
	Inequality in modern energy consumption	27	33	38
<b>Environment</b>		36	32	29
	Chemical pollution	71	65	57
	RSPM concentration	0	0	0
<b>Economic</b>		35	44	46
	Impact on trade balance	26	38	36
	Primary energy intensity	44	50	56

The Government has ambitious plans for the energy sector. These include drafting a new National Energy Policy, providing 24x7 electricity supply by generating 2 trillion units of electricity by 2019, producing 1.6 billion tonnes of coal by 2020 and installing 175 GW of renewables-based power capacity by 2022. It is imperative to adopt measurement frameworks such as the proposed dashboard to track and understand the sector given the scale and likely impact of such plans. Otherwise, there is a real danger of stumbling along haphazardly without being entirely sure of the direction taken by the energy sector.

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