



A Study On Analysis And Challenges Of Energy Sector In Asia

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Abstract

In India, demand for energy is increasing day by day at a rapid pace. We need a compelling and effective system for energy administration to overcome the financial and environmental consequences. To comprehend the progression of the energy strategy structure overseeing India's energy part, it is fundamental to fathom the strategy goals and setting in which they are put. Three primary energy approach targets are sought after by the Indian government:

To start with, access to energy is the preeminent objective in India's energy approach making, as about one-quarter of the populace needs access to power. This infers guaranteeing the supply of sufficient and dependable energy to the Indian populace in the midst of developing energy request, reinforced by monetary development. Second, energy security is driven by expanding reliance on imported fills, which is critical to meet the India's immense energy request. Expanded import reliance additionally uncovered the nation to more prominent geopolitical dangers and global value unpredictability. At last, India is committed to the alleviation of environmental change, despite the fact that beating energy destitution and guaranteeing monetary also, social improvement remains a best need.

Introduction

Rapidly increasing energy demand and growing concern about economic and environmental consequences call for effective and thorough energy governance in India. To understand the dynamics of the energy policy framework governing India's energy sector, it is essential to comprehend the policy objectives and context in which they are placed. Three main energy policy objectives are pursued by the Indian government:

First, access to energy is the foremost goal in India's energy policy making, as nearly one-quarter of the population lacks access to electricity. This implies ensuring the supply of adequate and reliable energy to the Indian population amid growing energy demand, bolstered by economic growth. Second, energy security is driven by increasing dependence on imported fuels, which is crucial to meet the India's huge energy demand. Increased import dependence also exposes the country to greater geopolitical risks and international price volatility. Finally, India is dedicated to the mitigation of climate change, although overcoming energy poverty and ensuring economic and social development remains a top priority.

Fulfilling all three objectives is not an easy task, as they can stand in conflict with one another. For example, supplying an affordable and considerable amount of energy using low-cost energy fuels, primarily coal, potentially undermines efforts to tackle climate change and local pollution. Pursuing the utilisation of domestic resources and promoting indigenous energy technologies could help enhance energy security in the long term, but does not solve India's energy problems in the short term.

This paper provides a comprehensive overview of India's energy sector and identifies challenges towards achieving the country's energy objectives. The paper is comprised of nine Chapters. Chapters 1, 2 and 3 provide the basic understanding of India's political economy, overarching energy policy framework and key features of India's energy sector as a whole. Chapters 4 to 8 focus on individual fuel sectors: power, coal, oil and gas, renewables and nuclear. These chapters describe how each fuel sector contributes to India's energy objectives and discusses pressing issues currently facing these objectives. The comparison of the IEA World Energy Outlook 2011 scenarios and the Indian government's projections in these chapters show how differently India's energy future can evolve based on different assumptions and circumstances. Finally, Chapter 9 discusses key energy challenges that are appearing across individual energy sectors and that are closely inter-linked with one another, pulling together the issues identified in previous chapters.

This Chapter especially aims to offer a strategic perspective into India's energy sector as a whole.

Analyses and data in this paper benefited from two IEA flagship publications: the World Energy Outlook (WEO) 2011 and Energy Technology Perspectives (ETP) 2010, as well as two India-specific

working papers: Technology Development Prospects for the Indian Power Sector and Energy Transition for Industry: India and the Global Context. IEA data is used as a basis for historical trends and current status, and for international comparison. This paper also used the latest official data and figures that were publicly available by the Indian government at the time this paper was written.¹

The impact and importance of India's energy policy in an integrated and interdependent global energy market is without question. A strong and sustainable energy sector in India is crucial to maintain the vibrancy of the Indian economy. This is also essential to the prosperity of the global economy.

Political system

The country, thus, has emerged as one of the most dynamic economic powers in the world. Yet there exist contradictions and complexities that posit considerable challenges to grasp the reality of India: a democratic political system co-existing with an economy with traces of socialism and a widening income gap between urban and rural areas as well as among states. This section presents a brief introduction of India's political-socio-economic landscape, aiming to provide insights into India's energy sector and the context of its energy issues.

Economic development

With nominal gross domestic product (GDP) of USD 1 847 billion, India was the tenth largest

economy in the world in 2011. In terms of purchasing power parity (PPP), with constant 2005 USD 3 976 billion, India ranked third after the United States and China in 2011. However, India's nominal per-capita income of USD 1 489 remained much lower than other large economies.

For example, it was less than one-third of China's per-capita income of USD 5 430 in 2011 (WDI, 2012).

The Indian economy is moving towards a free market economy, albeit with remaining traces of a socialist economic model. Inspired by the Soviet Union, after independence Indian policy makers infused many socialist elements into the Indian economy, including central planning, large public sectors, an import substitution approach and strict government regulations, which led to high inefficiency in the economy. Indian economic growth stagnated around 3.5% to 4% per year until major economic reforms commenced in 1991 (PC, 1995). The economy has increased at an average rate of approximately 7% since 2000. Amid the global economic recession in 2008, the Indian economy quickly rebounded and grew over 9% between 2009 and 2010.

In a series of economic reforms implemented throughout the 1990s and 2000s, the most significant is the industrial reform, or often-called New Economic Policy, effectuated in 1991. Amid India's balance of payment crisis and following intervention by the International Monetary Fund (IMF), the Indian government released a "Statement on Industrial Policy", which led to: the abolishment of industrial licensing for all industries (except those specified⁴); the approval of foreign direct investment up to 51% foreign equity in high priority industries; the automatic permission for technology agreements related to high priority industries; reform and disinvestment of public sector enterprises; and, the amendment of India's anti-competitive law – Monopolies and Restrictive Trade Practices Act (MOI, 1991). Consequently, throughout the 1990s, privatization and deregulation of major state-owned industries, including telecommunication and airlines were implemented as well as the liberalisation of trade under the World Trade Organization. Export of Indian products and services was encouraged and the Special Economic Zones (SEZs) policy was announced in 2000 and enacted in 2005 to attract larger foreign direct investments to India. As a result, India's export value multiplied by ten times from USD 18 billion in 1990 to USD 178 billion in fiscal year (FY) 2009/105

Social context

Although there has been significant progress in human development through economic growth, India still has a long way to go. It ranked 134 out of 187 countries in the 2011 United Nations Human Development Index (HDI) because of poor performance in the education and health indicators (UN HDI, 2012). Recent rapid economic growth reduced the absolute number of people living in poverty, but failed to achieve a balanced economic growth between rural and urban areas. For instance, 37.2% of the national population and 42% of the rural population live below the poverty line (BPL) of USD 1.25 PPP, whereas 26% of the urban population is considered

BPL (UNDP 2011). The average urban monthly expenditure is nearly twice that of the rural level. Considerable socio-economic imbalances exist among Indian states. For instance, state per-capita

income ranges from the richest state, Goa's INR (Indian rupees) 132 719 (≈USD 3 030), the richest large state Haryana's INR 78 781 (≈USD 1 670) to Bihar's INR 16 119 (≈USD 340) (PIB, 2010a).

Maharashtra with a population of 112 million and GDP of INR 8.1 trillion (≈USD 172 billion), accounts for 14.5% of India's total GDP. The state capital, Mumbai, is home to major banking, finance and insurance companies and the Bombay Stock Exchange is India's largest. Uttar Pradesh, located in the northern region, with 199 million population and GDP of INR 4.5 trillion (≈USD 96 billion) accounts for 8.3% of national GDP. It has large textile and shoe-manufacturing industries, although the majority of the population engages in agriculture. The six smallest states,

Meghalaya, Manipur, Nagaland, Arunachal Pradesh, Mizoram and Sikkim, are all located in the north-east region, and together contribute only 0.6% of national GDP.

2. Energy policy framework

The Indian government as a whole plays an indispensable role in the energy sector through state-owned enterprises, public policy and market regulation, indirect guidance and personal networks.

To grasp the intertwined dynamics in India's energy policy framework, comprehending not only the individual role of each ministry and government agency but also their interaction and coordination with other energy players is essential. Furthermore, some of the main ideas and themes that drive energy policy discourse in India should be taken into consideration. This section provides India's energy policy context, institutional arrangements and key overarching policies for better understanding of the country's energy sector.

Policy context

Understanding India's energy policy framework should begin by looking at policy contexts in which policy objectives and concepts are laid out. This will help to answer some of the questions about various decisions made by Indian policy makers. For instance, why has India adopted extensive subsidy programmes for energy products despite the fiscal burden? Why is India reluctant to actively participate in the international legal framework for climate change? How do Indian policy makers perceive rising dependence on imported energy and resulting greater exposure to geopolitical risks, and how do they try to address it? The policy objectives and concepts shed light on the rationales and motivations and eventually, energy policy making, which are to be discussed in the following chapters on the individual fuel sectors.

Nuclear sector

India has had a long commitment to nuclear energy since the establishment of the Atomic Energy Commission in 1948 and the Department of Atomic Energy in 1954. India was one of the few countries to achieve the complete fuel cycle – from uranium exploration, mining, fuel fabrication and electricity generation, to reprocessing and waste management – by the 1970s. (Sethna, 1979).

The country's nuclear industry is viewed with strong pride and considered an instrument to achieve “energy independence,” “fossil fuel free future” or “self-sufficiency” (Kalam, 2011;

Sethna, 1979). However, India's nuclear power capacity remains small despite continuous commitment and advances in indigenous technology. India's current nuclear generation capacity is 4.8 GW and ranks 13th in the world, which account for only 1.2% of global nuclear capacity (WNA, 2012). The share of nuclear was 1% in India's total energy mix in 2009 and 2% in electricity generation capacity in 2012 (Figure 31). This is the result of India's long isolation from the global nuclear energy regime and its emphasis on a thorium-based nuclear development programme.

Nuclear energy could play a critical role in addressing India's energy challenges, meeting massive energy demand potentials, mitigating carbon emissions and enhancing energy security through

the reduction of dependence on foreign energy sources. This is why India remains devoted to nuclear power even after the Fukushima-Daiichi accident in 2011 (PMO, 2012). This chapter discusses India's policy framework for the nuclear sector, provides an overview of nuclear capacity and prospects and key issues.

Conclusion

A serious energy shortage and growing pressure on imports have been seen in the Indian energy sector. In the middle of 2012, India's power shortage led to massive rolling power cuts across the nation. Industries and businesses shut down and public protests followed, demanding better power supply. That the current power crisis is not a temporary hiccup in the power system, but rather a symptom of the entire energy sector reaching the tipping point, is worrying. After a decade of unfinished liberalisation of the energy sector, India is now standing at the crossroads with a need for the next phase of energy sector reform. Strong political leadership is vital to address energy challenges.

Public perception should be shifted to accept that energy is not an entitlement, but a commodity. Energy supply cannot be taken for granted, and it requires sufficient resources to be delivered to consumers. India's policy objective of inclusive development and affordable energy should be maintained, but business viability cannot be sacrificed in the process.

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