Quenching India's thirst for energy

by Costanza Caputi

India's impressive economic growth and rapidly expanding population are fuelling the country's demand for energy, and increasingly, shaping India's external relations and foreign policy. In addition to altering regional dynamics in South Asia, this shift will have significant implications for global energy governance, as well as for climate change discussions.

India's burgeoning energy needs

India today struggles to meet its energy supply needs, as signalled by the massive blackouts witnessed in 2012 and the chronic power shortages that continue to plague the country. With a quarter of its population lacking access to electricity, India's struggles to satisfy its domestic energy demand – which, according to the International Energy Agency (IEA), is projected to grow at a compound annual growth rate (CAGR) of 3.2% until 2035, more than double than the expected world average.

The rise in India's demand for energy is outpacing *domestic* production for virtually every type of fuel. Local oil and gas resources are negligible: despite being the fourth largest consumer of oil in 2011, India possesses only 0.3% of the world's oil reserves. Gas reserves are slightly more abundant (1,074 billion cubic metres – bcm), but are nevertheless insufficient. The bulk of India's energy comes from coal, which accounted for 44% of the energy supply mix in 2011. Biofuels and waste – wood and dung – were the second largest source of energy in the same year, providing 25% of total primary energy supply. Nuclear, hydropower and renewables, although present, have only a small share in the country's total fuel mix.

As a result of these shortages, much of India's rising energy demand will have to be met by imports – already accounting for 35% of India's energy consumption in 2009. As a result, energy dependency will inevitably grow further. According to the International Energy Agency (IEA), India's import dependency on oil, already at 75%, is expected to reach 92% by 2035. Furthermore, India is also predicted to be importing about two-thirds of its natural gas by 2017.

Although India is one of the largest coal producers in the world, the gap between demand and domestic supply is widening here, too. India currently imports about one-tenth of the coal it consumes, and this figure is likely to increase. The coal shortage also results from production slowdowns of the poorly run state-monopoly Coal India Limited

(CIL), which supplies more than 80% of domestic coal. If current trends continue, India is set to be importing one-third of its coal by 2035 due to a combination of gross inefficiencies in the mining sector and a continuing demographic boom.

Securing energy supplies will be vital for the country in order to sustain its projected economic growth and further reduce poverty. India is thus under pressure to develop its energy sector across the board. Recognising the scale of this daunting task, the government devised an Integrated Energy Policy (IEP) in 2008. The IEP sets long-term goals for all energy sectors, and calls for the maximum exploitation of available domestic energy resources, setting ambitious targets for all fuel types. Furthermore, the IEP identifies the need for private sector participation in the heavily state-controlled energy sector in order to improve its efficiency.

So far, the Indian government has a poor track record in meeting its declared goals in certain energy sectors. For instance, although it has long been committed to the development of the nuclear sector, nuclear energy only accounts for 1% of the country's energy mix. The difficulties of nuclear development in India are related to the high costs and technological challenges associated with nuclear power, the country's scarce uranium reserves (which could potentially be replaced by more readily available thorium), and rising anti-nuclear public sentiment.

Notwithstanding these setbacks, the implementation of renewable energy projects has been relatively successful to date. The goal of generating 10% of electricity through renewables – enshrined in India's 11th Five Year Plan (2007-12) – was met ahead of schedule. Targets remain ambitious, and the 12th Five Year Plan (2012-17) aims to achieve a 16% share of renewables in total installed capacity by 2017. However, future prospects for development hinge on ensuring that related infrastructure (such as grids) is built or improved, and that the projects remain financially viable in order to attract investors.

Regional cooperation and dam politics

In addition to its considerable efforts to expand the domestic energy sector, India is increasingly looking abroad in order to satisfy its energy needs. Its immediate neighbourhood has been the first port of call. Regional cooperation in energy matters is often hailed as the solution to combat the relative resource scarcity of the South Asia region, as well as a means to foster greater political cooperation. The region could indeed make more of the resources with which it is endowed: Bhutan and Nepal are rich in hydropower, while India, Bangladesh, and Pakistan could boost the exchange of fossil fuels and refined products. Yet, thus far, opportunities for promoting greater intra-regional energy trade have largely been missed. The benefits of an integrated energy market are clear: power surpluses could be used to plug energy gaps, a larger market would benefit from improved levels of efficiency and allow for economies of scale; and, on a political level, further integration would result in greater regional stability.

In this respect, the development of a power transfer capacity between Bhutan and India of around 2,500 megawatts (MW) has proven to be a major success story. Since 2006, cooperation between the two countries has been enhanced through agreements over long-term purchases and Indian financial support for Bhutanese infrastructure projects. Today, hydropower exports account for over 19% of Bhutanese GDP and contribute significantly to the Himalayan country's poverty alleviation efforts.

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By contrast, the electricity trade between Nepal and India remains limited to about 60-100 MW – despite the realistic potential of achieving a level nearly 23,000 MW. Other projects – including a 500 MW interconnection facility between India and Bangladesh (under construction) and a 500 MW transmission line from India to Pakistan (under discussion) – also face serious difficulties. Most obstacles to progress are political, and there is still a great deal of general mistrust between the actors involved, most notably between Pakistan and India.

In addtion, India – as the dominant player in the region – has not been keen on making concessions to its smaller neighbours such as offering compensation for the costs of upgrading their energy export capabilities. India's partners also seek guarantees for their exports, and demand off-take market assurance. These difficulties are compounded by the fact that respective public opinions in the countries in question is often opposed to enhanced cooperation.

India's main suppliers of oil (2012)	Million tons
Saudi Arabia	24.8
Iraq	17.2
Venezuela	15.1
Kuwait	13.2
United Arab Emirates	11.4
Nigeria	9.9
Iran	9.7

Source: Indian government/Wall Street Journal

And financial problems play a role too: the creditworthiness of the main electricity buyer is an important factor to be considered before entering into any commercial deal. Selling to near-bankrupt Indian state electricity boards (SEBs), therefore, represents a significant risk.

The main rivers of the subcontinent – the Indus and the Ganges-Brahmaputra-Meghna basins – traverse two or more countries, thus making them natural sources of friction in the context of reduced water availability. India's plan to generate hydropower at home by damming the Himalayan rivers is riling its neighbours, in particular Pakistan, with Islamabad fearful of the prospect that Delhi could control vital water flows. The building of dams in Nepal is another case in point: while many (mainly poorer) Nepalis would have to be displaced, India stands benefit from increased irrigation and flood control.

The politics of dam-building in South Asia is further complicated by water scarcity. According to the Asian Development Bank (ADB), the average availability of water per capita has already decreased by 70% since the 1950s due to population growth, water waste, and industrialisation. Exacerbated by climate change, problems regarding water supply are only set to worsen.

Gas pipelines and geopolitics

In order to enhance its gas supplies, India has been contemplating two major projects: the Turkmenistan-Afghanistan-Pakistan-India (TAPI) and the Iran-Pakistan-India (IPI) pipelines.

In 2012, the four TAPI countries signed the Gas Sale and Purchase Agreement, which will allow India and Pakistan to access the vast Turkmen gas reserves via a new pipeline. The proposed pipeline is expected to transport 33 bcm/y of gas via Afghanistan to Pakistan and India (14 bcm/y will be supplied to India). The United States supports this project as part of its 'New Silk Road' strategy, i.e. the effort to promote Afghanistan as a trade and transit hub. But the increasingly energy-hungry geopolitical rival to India, China, is suspicious of such initiatives, as it also has a growing stake in the exploitation of energy resources of Central Asia. For example, according to IEA estimates, Chinese natural gas imports from Central Asia (predominantly from Turkmenistan) will account for 60% of China's gas imports by 2017-18. Apart from this potential scramble for resources, worries regarding the security situation in Afghanistan, as well as technical challenges and related financial risks continue to cast doubts over the feasibility of the TAPI project.

The IPI project – also dubbed the 'peace pipeline' – is a proposed 42-inch pipeline which aims to connect Iran and Pakistan (and potentially India). Despite encountering fierce opposition from the US – as it would counter some of the effects of sanctions on Iran's energy exports – Islamabad recently signed a deal with Tehran and announced the start of construction works. Delhi, on the other hand, backed out of the project in 2008 in exchange for a civil nuclear agreement with the US. Moreover, its reluctance to pay large amounts in transit fees to Pakistan also likely played a role in its decision to withdraw. Once again, China looms large in the region: it is providing Pakistan with a $500 million loan to help with infrastructure development, and has expressed interest in extending the pipeline all the way to China.

Progress on both projects has, however, remained slow. And even if concrete steps towards the implementation of these schemes are finally taken, geopolitical realities still exist as potential spoilers to the delivery of gas to the Indian subcontinent.

India's oil diplomacy

In a similar manner to China, India has recently entered the games of overseas asset acquisition and oil diplomacy as a means to secure energy supplies. The government has encouraged public and private sector companies to actively pursue acquisition strategies, which it has subsequently backed up with diplomatic action. The successful acquisition of a 20% stake in the Russian Sakhalin-I field concluded by ONG Videsh Limited (OVL), a subsidiary of India's flagship oil company ONGC, received political support from the highest levels. Indian companies have also managed to establish a strong presence in the Middle East and Africa: OVL

has acquired a 25% stake in the Greater Nile Oil Project (GNOP) in Sudan – which produced 1.324 million metric tons (MMT) of oil over the course of 2011-2012 – and has obtained exclusive rights to explore a site known as 'block 8' in eastern Iraq.

India's strategy has yielded moderate success, although doubts remain whether the overseas acquisitions by state-owned enterprises (SOEs) actually enhance energy security. Indian firms lack financial autonomy, and their initiatives are subject to lengthy government approval procedures, especially when compared to their Chinese rivals.

Beyond sending companies abroad, the Indian diplomatic apparatus is actively engaged in outright energy diplomacy. It has been reaching out to a number of energy-rich countries, offering help with infrastructure, loans and – most controversially – military assistance. For instance, Delhi has pledged to help modernise Nigeria's army, and Nigerian military officials have received training at India's Counter Insurgency and Jungle Warfare School in 2007. Even more striking, bilateral defence cooperation with Burma/Myanmar has been strengthened since 2006. Arguably, the 'search for equity oil' is the most important new element of Indian diplomacy in recent years, and one that will doubtless have future repercussions that remain difficult to predict.

The climate agenda

India's contribution to climate change is increasingly becoming the overriding issue in terms of the global impact of its energy policy. In order to fully understand India's position, both its domestic and international situations need to be considered. With coal the main (and cheapest) source of energy, India's CO2 emissions have continued to rise, almost tripling between 1990 and 2009, and accounting for 5.4% of global emissions. Given that fossil fuels will continue to dominate India's energy mix, the country's emissions will likely stick to a similar trajectory. Yet concepts of 'clean energy' and 'climate change' are increasingly entering Indian domestic political discourse and generating policy responses. For example, the government has put forward a National Action Plan on Climate Change (NAPCC) of 2008, which presents a 'vision of sustainable development'.

In international climate negotiations, India is firmly opposed to the introduction of binding emissions targets without adequate compensation and advocates a 'development first' approach. Although India pledges to maintain per-capita CO2 emissions lower than those of the developed world, this is an easy promise when considering its burgeoning population. Despite substantial increases, the IEA estimates that India's 2035 emissions per capita could, at 2.34 tons of CO2 per head (tCO2/capita), be considerably lower than the world average (4.25 tCO2/capita). The potential contradiction between domestic efforts to tackle climate change and the international negotiating position has been reconciled with the introduction of 'co-benefits', whereby domestic policies are aimed at benefiting both socio-economic development and contributing to climate change mitigation. It should be remembered, however, that in case of a conflict of interest between these two goals, development will prevail.

Opportunities for the EU

India and the EU have already agreed to form a 'strategic partnership', primarily on trade and security, but also on development cooperation and technological exchange. The EU also engages actively in energy cooperation with India: the main areas of work include development of clean energy technologies, in particular in the field of cleaner coal technologies, as well as energy efficiency and infrastructure (smart grids).

Given the EU's global ambitions and foreign policy priorities, climate change and global energy governance stand out as two main areas in which cooperation with Delhi can be enhanced. India is receptive to notions of 'clean energy' and, in fact, actively promotes the use of renewables. There is ample room for technological and private-sector cooperation in order to achieve sustainable answers to India's energy demands. In addition to the already established initiatives, European companies could also exploit the potential of off-grid renewables in order to provide rural areas with access to electricity.

On the political level, the EU could consider supporting India's further integration into global energy governance structures. The current institutional architecture does not reflect the effective weight of emerging global actors such as India and China: both are denied membership of the IEA – as OECD membership is a prerequisite – and thus miss out on energy-related technology transfers. The EU could now aim to have India not only as a 'strategic partner', but also as a committed ally in tackling global energy challenges.

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