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# CARBON*first*

## Climate policy and market insights

***In the India issue:***



***Nitin Desai, Member of the Indian PM Council on Climate Change***

- India's National Action Plan on Climate Change, attempts to demonstrate that tackling climate change can be concomitant with development objectives.
- India aims to increase its reliance on solar power dramatically, driving solar to the forefront of India's low-carbon industry.
- Investment will continue to flow into India's CDM and voluntary markets, with a move towards programmatic CDM and possibly non–UNFCCC offset standards.
- India's flagship policy, the PAT scheme, could create a US$15bn market by 2020, although it still faces many teething problems.
- With the introduction of the PAT scheme, the outlook for market-based regulation of energy efficiency in India is very encouraging. While the outlook for market-based carbon emissions cuts and international linking is less positive in the short-term, the PAT scheme offers a long-term hint of more to come.

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## Inside Policy Track

### *India's Take on Climate Policy*

*Nitin Desai, Member of the Indian PM Climate Change Council*

- India's National Action Plan on Climate Change (NAPCC) is a wide-ranging, ambitious plan to tackle climate change whilst promoting economic growth.
- The NAPCC will focus on promoting energy efficiency and solar power, in addition to ecosystem conservation.
- The flagship policy of the NAPCC is the PAT scheme – an energy efficiency certificate trading scheme.

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India's position on climate change has changed drastically over the past couple of years, with the government introducing a series of aggressive domestic policies to develop their low carbon economy. The stimulus for this came partly from the changing environment in the global negotiations, India's desire to be a player at the high tables of diplomacy and the growing involvement of the Indian corporates in CDM, renewables and energy efficient appliances.

India has steadily argued against a post–Kyoto agreement that places legally-binding emission reduction targets on developing countries. Based on the position that an international climate regime needs to grapple with issues of historical responsibility and human equity, India has traditionally focused its national resources on improving its own energy security, economic competitiveness and poverty, rather than addressing climate mitigation.

Throughout the last decade, energy security and economic competitiveness have become an increasing problem for India. The issue is not just oil prices and availability. According to Coal India Limited, the nation's largest coal provider, if coal consumption continues to grow, India is likely to run out of coal reserves by 2040–41, if demand continues to grow. This presents a fundamental challenge to India's energy security, as coal comprises over 50% of the country's energy mix.

India has reframed climate policy by implementing a framework that matches its national priorities of improving energy security, economic competitiveness and poverty. This wide-ranging approach is outlined in the National Action Plan on Climate Change (NAPCC). Eight missions flesh out the core goals of the NAPCC framework, each one promoting vital development priorities, whilst also yielding cost-effective co-benefits for addressing climate change. They are:

1. The Jawaharlal Nehru National Solar Mission (JNNSM)
2. The National Mission on Sustainable Habitat (NMSH)
3. The National Mission on Enhanced Energy Efficiency (NMEEE)
4. The National Water Mission (NWM)
5. The National Mission on Strategic Knowledge for Climate Change (NMSKCC)
6. The Green India Mission (GIM)
7. The National Mission on Sustainable Agriculture (NMSA)
8. The National Mission for Sustaining the Himalayan Ecosystem (NMSHE)

Apart from the last three, all missions have been ratified.

The issues addressed by these missions, which include energy and food security, access to water, sustainable industrialisation and growth, forest conservation and livelihoods, protection of ecosystems, and transition to a knowledge based economy, are delivered at a regional level. State governments are at different stages of preparing State Action Plans on Climate Change – the legislation that outlines how states will comply with the eight missions under the NAPCC.

Driven by the ambition of new solar energy companies such as Moser Baer, the JNNSM has a dual target of building 20GW of grid-connected generation and 2GW of off-grid generation by

2020. To deliver this target, the mission promotes an incentive scheme, similar to a feed-in-tariff, which fills the gap between the base price of grid connected power and the unit cost of power generation from solar technologies. In order to fund the JNNSM, a levy on coal (US$1 per ton of coal) has been introduced, with hypothecated revenues going to the National Clean Energy Fund; a fund dedicated to renewable energy projects.

According to the Indian government, US$500m is expected to be generated in 2010. The JNNSM is also providing financial assistance to the Solar Cities and Remote Village programs, and championing tax breaks and soft loans to support solar projects. The regulatory aspect of the JNNSM falls on State governments, requiring them to buy up to 3% of their energy by 2022 through solar power purchase agreements. *(See page 6, where Ameet Shah, explains the financial opportunities and challenges of exploiting the burgeoning JNNSM market.)*

Announced on the eve of the Copenhagen climate negotiations, the NMEEE is responsible for delivering the voluntary commitment to reduce India's emissions intensity by 20–25% by 2020. The NMEEE utilises a combination of carrot and stick approaches. Mandatory energy efficiency ratings are placed on four key appliances – refrigerators, air conditioners, tubelights and transformers – with more appliances to be included later. The NMEEE also places significant emphasis on urban planning, improved management of urban waste, the promotion of public transport and low carbon infrastructure.

Top Indian business executives have long called for policy to drive costs–savings associated with energy efficiency and conservation. The flagship policy under the auspices of NMEEE is the highly-anticipated Perform, Achieve and Trade (PAT) scheme. The PAT scheme is a market-based trading system that assigns energy savings to more than 750 facilities, which account for more than 50% of fossil fuel usage in India. According to the Indian government, the scheme will generate a US$15 billion market by 2015. *(See page 15, where Matthew Gray, explains the issues facing the PAT scheme and how it could interact with the international markets.)*

Although still being finalized, the unapproved NMSH and NMSA also place significant emphasis on energy efficiency. The NWM operates under the authority of the National Water Policy (2002) and increases the emphasis placed on the efficiency of utilisation and management of river basins, capacity building and innovation. The as-yet unratified GIM aims to achieve a total of 20 million hectares to be afforested or eco-restored in the next 10 years, thereby increasing carbon sequestration by 43 million tons $CO_2e$ annually. The NMSHE and NMSKCC set a longer term target of building a comprehensive knowledge base necessary to understand and address climate change threats. A particular emphasis is given to enhanced regional cooperation with neighbouring countries.

There are also a number of other 'non-climate' policies and regulations that constitute a significant part of India's response to climate change. These include: The Energy Conservation Act (2001), The Electricity Act (2003), The National Electricity Policy (2005); The Jawaharlal Nehru Nation Urban Renewal Mission (JNNURM, 2005); The Integrated Energy Policy (2006);

The New Environment Policy (2006) and The National Urban Transport Policy (2006). These policies have a strong emphasis on the accelerated deployment of energy efficient and low-carbon technologies, such as the Electricity Act, which requires the State governments to set Renewable Portfolio Standards for electricity production.

India has no shortage of creditable emission reductions, particularly in biomass, fuel switching and wind energy, which are becoming increasingly attractive ventures for Indian industrialists. Despite the increasing influence of offset projects on industry leaders, India's exposure to the carbon markets to date has been minimal and occurs mainly through the CDM market and to a much lesser extent, the voluntary markets. The problems plaguing the global CDM market have triggered interest in non-UNFCCC standards and could have contributed to the growth in programmatic CDM. *(See page 10, where Nick Oakes and Alessandro Vitelli, offers foresight on the future of India's carbon markets.)*

Technical groups on Reduced Emissions from Deforestation and Degradation plus (REDD+) methodological and monitoring issues and a National REDD+ Coordinating Agency have both been approved in order to assess and enhance India's preparedness to participate in the proposed REDD+ mechanism. The development of methodologies for National Forest Carbon Accounting is also underway.

The commitments outlined in the NAPCC also have the potential to bolster the stagnating international offset markets. The PAT scheme, in particular, offers considerable potential and should become a truly deep and liquid market over time. The JNNSM will also have a profound impact on the solar industry, bringing traditionally unfeasible solar projects into regulatory and voluntary offsetting regimes. However, despite the enthusiasm from the global North to link NAPCC policies to the EU ETS and the CDM, all current evidence suggests that India is repackaging climate policy as a means to improve its own economic competitiveness and energy security – and is hesitant to synchronise these measures to the international markets. *(See page 21, where Matthew Gray and Nick Oakes analyse the potential interface between Indian climate policy and the international carbon markets.)*

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## *Solar Mission – Powering India*

*By Ameet Shah, Co-Chairman of Astonfield Renewable Resources*

- Domestic solar power is bound to become a major energy source for India.
- The potential to scale-up solar power generation is huge, although a number of financial barriers dampen this optimism.
- The key market for solar energy in India will be the installation and maintenance of solar power generation.

***India's private sector has a growing interest in low-carbon technology and is pushing for ambitious solar programmes. In this article Ameet Shah, a leading proponent of solar energy in India, sets out his vision for the sector.***

***Introduction***

With the Prime Minister's announcement in November 2009 of a ten-year, 20,000-MW vision for solar power in India, the nation has officially embarked on one of the most ambitious solar initiatives in the world.

No solar program among the dozens globally is more important to successfully execute than India's. While developed countries are increasing their solar power deployments and other mediums of renewable energy in an effort to combat climate change and reduce their carbon footprint, solar power has a completely different meaning for India – it must become a significant contributor to the country's domestic energy security, and a key means of providing power to the approximately 400 million citizens living without access to electricity today.

***Rationale for a Solar Program***

From a developer's perspective, India already has three very critical elements in place for a world-leading solar program to be realised.

First and foremost, the natural resources (i.e. sunshine) necessary to support a sustainable solar market are more than enough to power the entire country. After the Sahara Desert, India is the sunniest location in the world – only one percent of the country's land would be required to electrify the nation.

Second, the technology for solar power is more accessible than ever and efficient, commercially proven solutions are even now being tailored to the Indian market. In fact, one of Astonfield's technology partners is now re-centering key parts of its global solar

engineering and design operation to India, given the innovation required to deliver solutions at the aggressive cost points demanded by Indian feed-in tariffs. They will now be exporting this innovation to all of their global markets as well.

Third, private sector interest and enthusiasm for promoting solar infrastructure has gained tremendous momentum. Commissioning the full 20,000 MW of solar power by 2022 (as outlined in the Jawaharlal Nehru National Solar Mission (JNNSM)) will require an inflow of approximately $40-50 billion of capital, which the investment community is ready and willing to provide.

This market opportunity for developers is also driving technology suppliers to consider serious investments in manufacturing and employment in India – one of our suppliers, after realizing the size of the market opportunity in India, made a commitment to build domestic manufacturing facilities in India by the end of 2011 rather than provide long-term supply from Europe.

***Scaling-up the Solar Market***

The JNNSM has provided the framework for serious developers such as Astonfield to make the goal of 20,000 MW of solar power by 2022 a reality. But with less than 20 MW of grid-connected solar installed in India today, we have our work cut out.

For the JNNSM to be successful, confidence in long-term scale and government support to grow a sustainable solar market must be there.

Achieving the proper scale in India is no problem. Between the growing power requirements of industrialized India and the drive to provide electricity to the part of the populace that is currently without, the demand for an unprecedented solar program is there. Solar is well-suited to India's needs – given the versatility of the technology we can deploy solar technology in large centralized utility scale power plants or small off-grid decentralized installations.

Getting the sustainability equation right presents a greater challenge; we define sustainability as the ability for entrepreneurs to enter the solar market, innovate, invest and create a long-term business that earns a reasonable profit. There are many contributing factors to achieving healthy sustainability in the solar market, but this article will touch on a few that we consider the most important.

***Financing Solar Power Plants in India***

Investors need a way to source global pools of capital at low cost. In a small–scale market such as India, where vast implementation is required to yield a reasonable profit, the capital expenditures are huge. To this end India's leadership would be well advised to create umbrella financing frameworks with multilaterals and commercial banks that the private sector can take advantage of.

Because of the time and cost of due diligence, most banks shy away from project financing for deals of less than US$30 million, which far exceeds the capital requirements of a typical project created under the JNNSM, approximately 5–10 MW in size. Hence, an umbrella framework would be a great facilitator of growth in the solar sector by overcoming this barrier to investment.

It's possible to achieve low cost financing through long–term Power Purchase Agreements (PPAs) with credit-worthy customers, working with strong engineering and construction partners with long and successful track records installing solar plants in other markets, and ensuring that realistic assumptions are made regarding the power generation potential of a chosen site.

Besides keeping financing costs low, the tariffs and financial framework supporting the JNNSM must be adequate enough to generate an attractive profit, which may be higher than alternative technologies. Indeed, the JNNSM has come under criticism due to the "high" cost of solar, and the cost to the government to sufficiently incentivize the mission. But when one considers the opportunity cost of non-supply of power to industry, the rising cost of fossil fuels, and the existing subsidies for conventional energy, these criticisms do not hold much water. Furthermore, the cost of installing solar plants is rapidly reducing each year, meaning that the cost of installing gigawatts of solar capacity starting in 3-4 years during Phase II of JNNSM will be relatively less per unit of installed capacity than the initial 100-200 MW installed at current costs over the next 12-18 months.

***Building a Domestic Solar Industry***

It would be remiss not to share our thoughts on local content requirements for solar projects in India. Very simply, the solar industry is nascent and local content requirements risk maintaining an unnecessarily high tariff level for solar power given that Indian manufacturing options are not yet cost-competitive with global supply options available to developers. Hence, local content requirements will likely be more of a hurdle than an asset.

It is precisely this global competition that will stimulate Indian manufacturers to invest in R&D and innovate on solar technology and/or establish technology transfers with global partners in order to indigenize the most proven, efficient, and cost effective solutions for India. This is all the more important given that solar panels account for approximately 50-60% of the total system cost of a power plant, so panel pricing and performance are the most important element in building a commercially viable project.

Developers must have the freedom to choose the best technology, regardless of where it is manufactured. Meanwhile, the Indian government can achieve significant local manufacturing opportunity along with employment creation in the near term by focusing on building local expertise in solar power plant installation and balance of system manufacturing.

***Conclusion***

If India can maintain a proactive stance on solar power and continue to incubate and scale up the sector, the benefits to the country are tremendous – both skilled and unskilled job creation, increased energy security, growth in R&D and manufacturing, augmenting our current national energy portfolio, and providing power to the 400 million citizens without, not to mention cashing in on Foreign Direct Investment and venture capital opportunities.

While the initial "era" of solar power was dominated by the Europeans and Japanese, it is not too late for India to achieve a global leadership position in solar power generation. The JNNSM provides an excellent framework to achieve this, but the challenge is to successfully translate the mission from strong policy into seamless execution.

The first step is to get initial capacity pumping power to the grid, most likely from the projects permitted under the "migration" phase of the program. For the sake of energy security, economic development, and citizens' welfare, it is imperative that India makes the solar mission a success. Electrification is the cornerstone of civilization, and for India to grow, it must become a completely electrified country.

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## *The Changing Face of India's Carbon Markets*

*By Nick Oakes and Alessandro Vitelli, IDEAcarbon*

- India is the world leader in programmatic CDM.
- India looks set to embrace non-UNFCC voluntary offset standards if a ruling on CER restrictions falls against their favour.
- Although India is laying the foundations for an expansive set of environmental markets, the possibility of linking these to international markets, or the emergence of a domestic carbon market, remain distant possibilities.

***Introduction***

Like China, India's emissions have come under increased scrutiny from the international community over the past decade. As a result, Indian climate policy has developed considerably over the last five years with emissions abatement mechanisms being considered, discussed and implemented with increased urgency. India's response predominantly favours regulatory means, although, with the introduction of market-based initiatives such as the PAT scheme, there is an emerging interest in trading mechanisms.

India's historical exposure to trading schemes is similar to many of the Kyoto Protocol's non-Annex I countries. It has traded carbon, predominantly through the Clean Development Mechanism (CDM) and, to a much lesser extent, the voluntary carbon markets. Moreover, Indian industry is becoming increasingly carbon conscious because of the large number of CDM deals, with carbon credit revenues now being considered on a routine basis. In this article we explore the current state of these markets and the possible ways in which they may develop.

***The current state of India's carbon markets***

India's CDM market is the second largest in the world after China. In terms of issuance volumes, it supplies 18% of worldwide Certified Emissions Reductions (CERs), which is still a long way behind China's 51% share of the market. According to the UN, India's CDM market has driven a total of $11.5 billion of clean technology investment since 2005. This year, however, it appears likely to drive investment of around a third of last year's total.

The voluntary offset markets command much smaller sums of money than the CDM market. The number of projects registering through the voluntary offset markets grew substantially through 2008 due to the anticipated demand for offsets from the USA, when investors were confident that the US would establish a domestic carbon market.

The dwindling confidence of investors that any US cap-and-trade scheme will be approved within the next 12 months has decreased this anticipated demand to such an extent that some experts now envision no expansion of the voluntary markets in India, and possibly even a decline. This is because India's voluntary markets, as they exist now, are heavily dependent on overseas demand.

Such a dire prognosis cannot be assigned to India's CDM market. That said, the number of projects registering under the CDM in India is following a long-term, moderately declining trend. Although it is fair to say that the number of projects registered each month/year fluctuates wildly, the trend appears to be a decline from the heights reached in 2006 - 2007. The volume of CERs issued each month/year also appears to be following a similar long-term trend, although a little less pronounced. These trends are consistent with the overall trend in the CDM market and reflect the profound impact of both the recession and post-2012 uncertainty.

This rests in stark contrast to the sentiment of Indian business opinion. Most retain a sense of optimism regarding the growth of the CDM market in India over the coming years. Perhaps, then, it is more prudent to consider developments in the wider context of the CDM market. From this perspective, one can attribute a number of market-wide reasons to India's moderate decline in investment, issuance and project registration. Perhaps more importantly, however, this perspective can help to outline the possible avenues of future developments in the carbon markets.

Project developers face the risk of not being able to carry over CERs into a second (post–2012) Kyoto compliance period. There has been some resolution of this issue with the European Union's decision to allow carryover of CERs into the third phase of the EU ETS. However, the uncertainty over the existence of a subsequent Kyoto compliance period still persists, thereby damaging investor confidence.

A number of more recent developments leave investors even more uncertain of the CER market. The CDM Executive Board has yet to make a decision on the qualitative restrictions placed on the types of projects eligible for CER issuance, most notably the destruction of industrial gas HFC-23. Investors fear that restrictions limiting or even banning the use of CERs from HFC-23 or even possibly $N_2O$ destruction projects will invalidate such a large proportion of the total CERs awaiting issuance that the liquidity of the carbon markets will be severely damaged.

Furthermore, the question of Designated Operational Entity (DOE) liability for invalid issuances of CERs has not been clarified, leaving investors fearing a breakdown in the market's functions should DOEs become liable. Finally, the question over whether the qualitative restrictions and DOE liability would apply retrospectively also remains unanswered.

***The move towards programmatic CDM***

The myriad problems with the CDM market have led to mixed opinions over the future of India's CDM market. Some suggest that problems with the CDM process will cause irreparable damage to the CDM market as a whole, whereas others are optimistic due to India's move towards programmatic CDM and the diminishing effects of the global recession. In fact, the increasing investment in programmatic CDM is seen by many as a potential high growth area.

At this stage, it is still relatively unclear whether investments are flowing away from project-based CDM and towards programmatic CDM, with the overall investment remaining the same, or whether new and additional investment will be encouraged by programmatic CDM. The consensus among business leaders and public officials is that as the programmatic CDM market grows, the latter is more likely.

India is among one of the first entrants to the programmatic CDM market. Of the four Programmes of Action (POA) that have registered since October 2009, one is from India, and of the remaining fifty two awaiting registration, seven are from India. In total, twenty-four countries are now hosting programmatic CDM, and just over 14% of all POAs are from India. This is the largest proportion of POAs hosted by country – 4% larger than China – and suggests that India may be attempting to gain an early mover advantage, becoming the leader in programmatic CDM.

Although programmatic CDM has many benefits over project-based CDM – including improving the cost-effectiveness of CERs originated from fragmented sources and the deepening of technology transfer – it is still in its early stages and is subject to the same overtly onerous and time consuming bureaucratic barriers as the project-based CDM was, in addition to the post-2012 uncertainty and the capital availability constraints that have emerged as a result of the recession. As such, it is worth considering the potential for development of the carbon markets outside the CDM.

***Offset markets outside the CDM***

The growing consensus amongst most market participants is that bilateral agreements are a feasible alternative for transacting offset deals, rather than relying on stagnating international agreements and fledging national cap-and-trade systems. For the offset markets, bilateral agreements mean that money can flow through the CDM – in whatever form it may take post-2012 – or it can circumvent the mechanism entirely.

For this reason, there is a growing desire to understand the role that voluntary offset markets could play in harnessing the supply of projects that are exposed to the problems described above. A market of this sort, that bypasses the CDM, would be dependent on the content of bilateral agreements, rather than the cumbersome and watered-down international agreements likely to emerge from UNFCCC negotiations.

An important point to note is that a market bypassing the CDM would require non-UNFCCC offset standards to be adopted by the Indian government. IDEAcarbon's discussions with key stakeholders suggest that this is a not-so-distant possibility. Many Indian offset projects were designed to meet the Climate Action Reserve (CAR) standard, as this is the standard that will be the used by the Western Climate Initiative (WCI). This demonstrates a willingness to adopt a non-UNFCCC standard if the demand for the offsets already exists or is anticipated to exist.

The debate on the role of alternative bilateral mechanisms is highly contested. Some feel that the institutional structure of the CDM could be mimicked, while others feel that the cumbersome process must be redesigned from scratch. If the latter was implemented, without an institutional structure similar to the CDM, a non-UNFCCC standard may require external verification and is therefore unlikely to proceed.

On the other hand, some market participants predict that if qualitative restrictions are placed on Indian CERs, and the CDM continues to be a costly and timely process, project developers may opt for non-UNFCCC standards. Given the likelihood that some restrictions could emerge from the CDM Executive Board's decisions, opting to sidestep the CDM may be the more proactive position to take, although any non-UNFCCC standard must retain the robustness of the CDM.

It is worth noting that the extent to which a voluntary market can serve as a substitute for the CDM market depends entirely on its ability to cope with sharp increases in the supply of offset credits which, given the lack of depth in the voluntary markets, could lead to a bottleneck between supply and demand.

***Financing REDD***

Project-based CDM, programmatic CDM and non-UNFCCC voluntary markets could overlap in forestry. It is important to consider this field since Reducing Emissions from Deforestation and Degradation (REDD) is believed to be an area where progress can be made in international negotiations. Through the recently established REDD Readiness Programme – a government institution that is building the technocratic and governance capacity to enact forestry accounting – India has been making significant headway in this regard.

A missing piece of the puzzle in REDD debate is the clarification over exactly where the money to finance REDD will come from. In India, large buyers of voluntary offsets have shown an interest in purchasing offsets through a REDD scheme. However, it seems more likely that the Indian government is going to enact any REDD policies through government funding and/or regulations, based on discussions with actors close to India's environmental markets. Thus financing REDD through market-based mechanisms seems an unlikely possibility at this stage.

***International Linking and Domestic Markets***

In the wider context of international and domestic carbon markets, the Indian government's National Action Plan on Climate Change (NAPCC) is a plan to fight climate change by enacting domestic measures only, begging the question of whether the Indian government intends to synchronise domestic mitigation schemes with international efforts.

An obvious starting point is whether the government intends to use domestic mitigating actions such as Nationally Appropriate Mitigating Actions (NAMAs) in an international compliance regime, or if the government intends to link up its only trading mechanism – the PAT Scheme – to international markets. The immediate answer is no. It seems that considerations of international linking are secondary to actually establishing the domestic measures themselves, meaning that the government is not yet considering it.

Indeed, it seems likely that the Indian government will set up a trading scheme for the air pollutants $NO_x$ and $SO_x$ in the medium to long term. Discussions are underway regarding the feasibility of such a scheme, whilst authorities in the two provinces running trials of a trading scheme – Tamil Nadu and Gujarat – are establishing the baselines of emitters.

Combining this scheme with the energy efficiency certificates and renewable energy trading schemes will create a substantial environmental market in India, missing only a domestic carbon market. Discussions suggest that although these schemes are designed independently of a domestic carbon market, they can, and may be, used by bureaucrats as a means to expose industry to the mechanics of a trading scheme prior to implementing a more expansive domestic carbon market.

***Conclusion***

India's current exposure to the carbon markets occurs mainly through the CDM and, to a much lesser extent, the voluntary markets. The problems plaguing the global CDM market have sparked interest in non-UNFCCC standards and could be linked to the growth in programmatic CDM. If, as seems likely, restrictions on the project-based CDM are enforced, and the cumbersome nature of the CDM remains unaddressed, bilateral deals and non-UNFCCC standards will become commonplace, possibly superseding the CDM. That said, the cost gains from implementing programmatic CDM are likely to continue to drive growth in this area over the next few years.

In the longer term, India appears to be laying the plans for a set of environmental markets. The extent to which these environmental markets will be used to build the capacity needed to create a domestic market, or link existing markets to international carbon markets, remains ill-defined. Nonetheless, the long term prospects for India's carbon markets generates a greater sense of optimism than those of the short term, primarily because it is dependent, to a lesser degree, on the state of climate talks and the CDM market's problems.

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## *Introducing the Perform, Achieve and Trade (PAT) Scheme*

*By Matthew Gray, IDEAcarbon*

- The PAT scheme is a market-based energy efficiency trading scheme that will assist India in its commitment to a 20–25% reduction in emissions intensity from 2005 levels by 2020.
- According to the Indian government, the scheme could create a US$15 billion market by 2015.
- The scheme faces numerous challenges, including: accurate baseline setting, building institutional capacity and fostering market liquidity.

### *Introduction*

India's market-based Perform, Achieve and Trade (PAT) scheme, due to be launched in April 2011, is one of several policies under the NAPCC that endeavours to make carbon policy congruent with India's critically important development priorities. This article explains (1) the details of the scheme; (2) the key challenges for policy-makers and market participants; (3) the interface with CDM investment flows; and (4) the potential for linking the scheme to the international markets. According to the Indian government, the scheme will create a US$15 billion market by 2015.

### *Background*

India has made it clear it will not accept any international agreement that does not grapple with issues of historical responsibility and human equity. Poverty and power shortages are considerable problems in India and these problems have taken precedence over action on climate mitigation. India rightfully voices the need for industrialisation to reduce poverty and improve energy security. India also recognises the need to increase its economic competitiveness, especially with its main Asian competitor – China. This ultimately involves using less energy to do more.

By embracing energy efficiency, India can boast economic competitiveness and improve energy security. This is the main impetus for the scheme. A study by the Ernest Orlando Lawrence Berkeley National Laboratory found that India's cost-effective end-use electricity efficiency measures have the potential to eliminate the country's expected electricity deficit

by 2014, while at the same time requiring less investment for new power supply compared to the business-as-usual scenario[1].

***Scheme details***

The Bureau of Energy Efficiency (BEE), the agency spearheading energy efficiency programmes in India, intends to drive cost savings from large energy-intensive industries through the PAT scheme. Under the scheme, which embraces 65% of industrial energy consumption, more than 700 companies in nine sectors – thermal power plants, aluminium, chlor-alkali, cement, fertilisers, iron and steel, pulp and paper, railways and textiles – will be allocated annual energy efficiency targets from 2011 to 2014.

Although the design details are still being finalised, the scheme is a 'classic' baseline and credit system that will closely resemble the UK's Climate Change Agreements (with the obvious inclusion of an additional trading component). Baseline and credit systems set emissions baselines against which performance is measured, with reductions credited after the fact. The scheme will only incorporate trading elements after three years from its inception.

Based on historical performance, energy intensity targets will be allocated through either individual baselines or performance bands. According to the BEE, energy consumption varies considerably across companies in every sector; therefore, the emission reduction targets will be mostly company-specific, but will add up to meet the overall reduction targets that will be apportioned to the designated sectors.

Those companies unable to meet the targets will comply by paying a penalty or purchasing credits (termed Escerts) from those companies able to over–achieve their target. Escerts, representing one ton of oil equivalent, will be allocated once savings have been made and verified. Companies with PAT targets will be permitted to use renewable energy certificates (RECs) issued to renewable energy generators under India's planned Renewable Energy Incentive programme. However, companies with REC targets will not be able to use Escerts to demonstrate compliance.

**Challenges**

Dependent on the ratified details of the scheme, which are far from known, the PAT scheme faces several challenges. These are discussed below.

The short-term priority for BEE is to get companies to accurately measure and monitor their energy footprints to expose financially attractive reduction measures. There are a number of stakeholders in this process, including regulated entities, energy suppliers, financial institutions, brokers, traders, consultants, equipment manufacturers, all of whom have

[1] Sathaye, J. and Gupta, A. (2010), Eliminating Electricity Deficit through Energy Efficiency in India: An Evaluation of Aggregate Economic and Carbon Benefits, and Ernest Orlando, Lawrence Berkeley National Laboratory.

different levels of understanding of the scheme. Measuring and monitoring energy footprints will involve developing guidelines and standards to aid the indoctrination of robust energy monitoring and reporting. Building institutional knowledge amongst all the relevant actors will be crucial to establishing accurate benchmarking and Escert allocation. The BEE will likely require considerable support from the private sector to ensure this eventuates.

The issuance of Escerts prior or post verification requires careful consideration. On one hand, issuing Escerts once energy intensity reductions have been verified will avoid flooding the market. Presuming Escert allocation is robustly verified, this issuance process would also avoid the damaging effect of over allocations, as experienced during the early stages of The EU Emissions Trading Scheme (EU ETS). One the other hand, dependent on the stringency of the targets and the cost-effectiveness of RECs, there could be limited liquidity with a considerable shortage of Escerts in circulation during the early stages of the scheme.

Liquidity could be improved through the short-term auctioning of Escerts, or the purchasing of CERs and EUAs on the international markets, although these elements are not currently included in the scheme design. Over the longer term, assuming there is a constant supply of Escerts in circulation, participants could increasingly rely on in-year trading.

Regardless of whether auctioning or international credit purchasing is included or not, the timeliness of Escerts verification and issuance is going to be crucial. If this process resembles the approval and issuance timeframes under the CDM, price discovery and the overall functionality of the scheme would be severely compromised. The BEE is currently proposing a gate-to-gate measurement system (i.e. total amount of energy that enters the gate divided by total amount of product that leaves the gate). Since verification can be audited against energy bills, this process will be considerably easier than the complicated criteria adopted under the CDM.

As far as trading and credibility are concerned, the scheme needs to be as transparent as possible. The establishment of long-term target forecasting and real-time trading platforms on the major exchanges will be essential. BEE has already indicated that both the Indian Energy Exchange and Power Exchange India will offer real-time markets in Escerts. If streamlined verification and market transparency still don't stimulate liquidity, price discovery will be limited and bilateral deals will become commonplace, as is currently the case within the NZ ETS.

**Economic Theory of Project Uptake**

The economics of MAC curves places a theoretical limit on the type of projects that can be targeted by the scheme. In theory, energy efficiency measures with a positive net present value (NPV) (see the figure below) should have already been undertaken, because the cost savings from making this investment are greater than the upfront costs of abatement. This means that the price of an Escert must be set at a level where the marginal cost is equal to

the marginal benefit, since a price lower than this will mean that no installations need to buy credits to meet their requirements, as its cheaper for *all* the individual polluters to abate on–site. This would render the Escerts valueless – since no companies need to buy the Escerts to meet the targets – which could lead to a price crash. Prices should therefore be set in such a way that they are targeting additional projects, i.e. those that should have already occurred anyway, in order to ensure the Escerts have a positive price.

***Distortion of CDM Investment***

There has been widespread concern that the scheme will distort India's CDM market since, as the MAC theory dictates, the scheme is capturing wholly additional projects – potentially the same projects that the CDM is capturing. We contend that, because of market failures (e.g. time constraints, managerial awareness, limited capital, etc), financially non–additional investments with a net marginal benefit are rarely made. Through accurate target-setting this concern could be reduced to ensure the scheme complements CDM investments.

Often these market failures are powerful barriers to action. For example, because most firms have limited access to capital – the dominant market failure impeding energy efficiency uptake – energy efficiency investments are in direct competition with other core business investments, such as implementing sales strategies, which always have considerably shorter pay-back periods. By design, if the architects of the scheme limit the energy intensity targets to include all measures that have a neutral or positive NPV, thus the scheme would not interfere with financially additional CDM initiatives. This is because those projects with a negative NPV – that will not be undertaken through the auspices of the scheme – would go beyond business-as-usual and therefore would be 'additional' and approvable CDM projects (see the figure below). This would not, however, stop market participants going beyond the targets, which could occur if Escerts become more valuable than CERs.

**Avoiding CDM distortion**

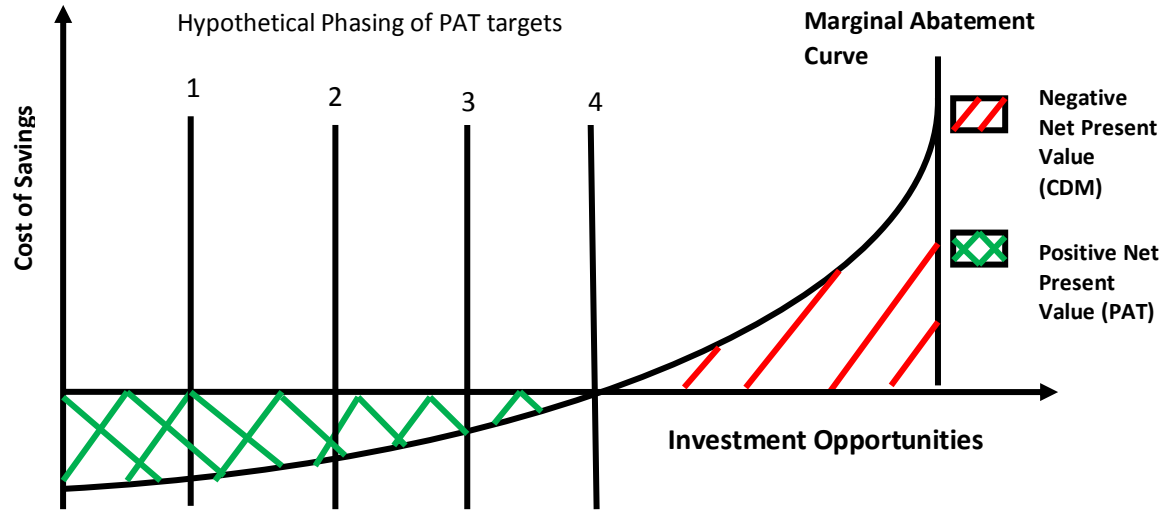


**Figure**: A conceptual outline of how the scheme could potentially complement the CDM by targeting measures that have a positive NPV and therefore are not considered additional within CDM eligibility criteria.

It is important to note, the CDM has two methods of additionality: financial additionality and non–financial additionality. By definition, under the scheme, the energy efficiency initiatives are financially viable or NPV neutral or positive. Despite this, one needs to realise that the MAC curve is dynamic and what is additional today may not be so a few years down the line. Thus forth, a reflective approach needs to be taken when determining the scheme's target setting and its potential to distort CDM investment.

***Linking to International Markets***

There is considerable interest (from the global North) to link the EU ETS and the CDM to the scheme. Research from IDEAcarbon postulates that linking is a distant possibility that currently has limited political will within India. As mentioned above, the scheme will only incorporate trading elements in 2014 with a strong possibility of market illiquidity throughout the early stages. Indian policy-makers will want to ensure domestic buyers have adequate access to Escerts before opening the PAT market to international buyers.

Even if market liquidity increases as the market matures, there are significant issues with linking. Most notably, the scheme deals with reductions in energy efficiency – not carbon reductions, which could create economic disparity between the scheme and the international markets. Since the targets under the scheme are set on the basis of energy efficiency, with one Escert representing one ton of oil equivalent, there could be disparity between what a reduction is worth within the scheme and what a reduction is worth on the international carbon markets. For example, one ton of CO2e from an oil saving is likely to be worth more than one ton of CO2 on the international market.

Based on the issues surrounding Escert exchangeability and the reality that Escert supply will only become available at 2014 – at the absolute earliest – for the foreseeable future the Escert market will not be linked to trading systems in the global North.

***Conclusion***

The fact that India is about to implement one of the most ambitious trading mechanisms outside the developed world should come as no surprise given the country's fundamental concerns with energy poverty and security. Furthermore, compared to China, its manufacturing industry is economically less competitive.

These realities, rather than the desire to mitigate dangerous climate change, have led to the development of the PAT scheme. This pragmatism should be celebrated, because it reinforces the message that many ostensibly environmentally-focused climate initiatives can make good business sense.

The scheme faces numerous challenges, such as establishing accurate baselines, building the institutional capacity and ensuring Escert liquidity. Only time will reveal whether the scheme will link to the international markets; but for now, India has designed the scheme independent of this possibility.

***For further information please contact carbonfirst@ideacarbon.com.***

## *A Reflection on India's Climate Change Policy*

*By Nick Oakes and Matthew Gray, IDEAcarbon.*

- Despite the ambitious nature of the NAPCC and the implementation of the PAT scheme, India is unlikely to implement a national carbon trading system over the short–to–medium term.
- Due to India's ongoing reluctance to sign up to an international agreement that sets legally–binding emission targets, India is unlikely to embrace the international carbon markets.

***Introduction***

A cursory glance of the National Action Plan on Climate Change (NAPCC) seems to confirm India's commitment to climate change mitigation, whilst simultaneously bolstering economic competitiveness, energy security and other development priorities. A closer inspection, however, reveals an apparent preference for abating emissions via regulatory 'command and control' mechanisms rather than market–based mechanisms typically endorsed by the developed world. This article reflects on India's approach to climate policy and offers opinion on what this means for the international carbon markets and ongoing climate negotiations.

***NAPCC – subsides, taxes and standards***

Apart from the Perform, Achieve and Trade (PAT) scheme and Renewable Energy Standards (RES), all policies fall under the auspices of the NAPCC are either financial incentives, such as subsides and taxes, or minimum standards. Feed-in-Tariffs, the coal tax and vehicle fuel standards are examples of these policies.

India's response to climate change, via the NAPCC, is not based on reducing greenhouse gases, but is more a collection of pledges, policies and regulations that create a low-carbon industry, generating jobs and wealth, with the concurrent potential to curb emissions growth.

Our assessment of what this means for carbon trading in India, linking to the international markets and the ongoing climate negotiations follows.

***National Carbon Trading in India***

All discussions with stakeholders indicate that the PAT scheme is a means to bolster economic competitiveness through increased energy efficiency. The same discussions suggest that India may be planning to build a set of environmental markets, of which the PAT scheme is the first, as a possible means to accustom their industry with trading schemes prior to implementing a carbon trading scheme. The ongoing discussion of setting-up an emissions trading scheme for air pollutants adds further credence to this argument.

We dismiss the suggestion that India is accustoming industry to trading schemes in favour of the opinion that India has a lot of energy efficiency savings to be captured, and that the PAT scheme is a vehicle to capture these cost–savings.

***India and the International Markets***

India, over the short-to-medium term, is unlikely to participate in an international trading system. This is because, firstly, substantial technical and political barriers will prevent linking the PAT scheme to the international markets. Over the short-to-medium term, however, this market will only operate within national boundaries, with limited interface with the international markets. The disparity between the financial value of oil and carbon savings will create problems linking to international cap-and-trade schemes.

Secondly, Indian regulators will want evidence that regulated companies have access to cost-effective Escerts before they allow their heavily regulated competitors in Europe the opportunity to participate. Other than increasing liquidity for CER market participants and opening up foreign investment for Escert origination (which presumably could be provided through bilateral deals anyway), India has little incentive to link to the international markets.

Third, unless a baseline and credit system that freely allocates India a carbon budget is endorsed by developed countries, India will unlikely agree to any international carbon trading system that could potentially restrict its economic growth.

For these reasons, we suggest that India is unlikely to participate in an international trading scheme. Indeed, most countries are now resigned to the opinion that a global market of this nature is unlikely to emerge from UN climate negotiations until at least 2020.

Of existing international markets, we believe that India's exposure to the carbon markets will continue to be solely through the offset markets. India has the potential to grow its CDM and voluntary offset markets, particularly with the move towards programmatic CDM and the potential to adopt bilateral and non–UNFCCC offset standards, but it is unlikely to move beyond the offset markets.

***For further information please contact carbonfirst@ideacarbon.com.***

## Carbon Calendar™

**Notes:** Policy events of particular significance are highlighted in bold.

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|---|---|---|---|
| **15-16 November 2010** | **3rd Governors' Global Climate Summit** | **California governor Arnold Schwarzenegger's annual event will bring together leaders from around the world to collaborate on efforts that will further the global fight against climate change, work towards collaborative actions to help reduce emissions and build green economies.** | Costa Rica |
| **22-26 November 2010** | **58th Meeting of the CDM Executive Board** | **The EB will discuss the outcome of the Methodologies Panel's investigation into the AM0001 methodology for HFC-23 gas projects.** | **Cancun, Mexico** |
| **29 Nov - 10 Dec 2010** | **16th Session of the UNFCCC COP and 6th Meeting of the Parties of the Kyoto Protocol** | **Sixteenth Session of the UNFCCC COP and Sixth Meeting of the COP Serving as the Meeting of the Parties to the Kyoto Protocol.** | **Cancun, Mexico** |
| **31 December 2010** | **European Commission issues its estimate of the total quantity of EUAs to be auctioned in Phase III.** | **The Commission will incorporate data from new sectors and gases that will be included in the third Phase of the EU ETS.** | **Brussels, Belgium** |
| 31 December 2010 | **Adoption of Auctioning Regulations Phase III ETS** | **The European Commission and Member States have already approved the regulations and have passed them to the European Parliament for consideration.** | **Brussels, Belgium** |
| **1 January 2011** | **Commencement of Hungarian EU Presidency** | **Hungary occupies the EU Presidency until the 30th June 2011** | **Brussels, Belgium** |
| **31 March 2011** | **Deadline for aviation operators to apply for free allocation of EUAs from European Commission.** | **Aircraft operators must also submit a verified report showing the tonne kilometres flown during 2010.** | **Brussels, Belgium** |