



Confederation of Indian Industry

**DISCUSSION PAPER PREPARED FOR**  
**STAKEHOLDER WORKSHOP ON**

**“Lessons learned from the UK and International  
experience for the potential of Mandatory and Voluntary  
Trading Schemes for Energy Efficiency and Climate  
Change”**

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## **DISCUSSION PAPER: ESTABLISHMENT OF AN EFFECTIVE MANDATORY TRADING SCHEME IN ENERGY SAVING CERTIFICATES IN INDIA**

This discussion paper, requested by the Government of India Bureau of Energy Efficiency, combines two separate issues of relevance to the upcoming UK India workshop, a dialogue requested by the Government of India's Ministry of Power. This Discussion Paper has been developed for the British High Commission / DFID India using "work-in-progress" material by a consortium of Camco-CII-ABPS. The paper has two sections:

1. Lessons learned from international policy experience
2. Possible linking of the proposed PAT scheme with international "carbon markets".

### **Summary of key questions for discussion**

- Scheme coverage: How deep will the scheme go? What percentage of energy consumption and production is covered?
- Building on the experience of the UK CCAs, in which industry generally over-achieved their targets, what are the possible challenges of target setting? Is this an area where further analysis could be helpful?
- Given the energy efficiency / energy security benefits of PAT coverage, does the GOI see merit in discussing whether PAT could potentially target additional sectors over time?
- Alongside the 9 core sectors that will be required under Indian law to be part of PAT, does the GOI see merit in exploring the potential of allowing a voluntary extension to the scheme (e.g. a voluntary opt-in for additional sectors)?
- Improving liquidity and price discovery: Learning from the UK experience.
- Learning from UK experience, recommendations on a process / intervention to create a price floor / ceiling while mindful of the potential risks and distortions this can cause?
- Possibilities of including the EU ETS and CRC concept of cash penalty with the requirement to retire an allowance per tO<sub>2</sub> as a penalty, to maintain environmental credibility.



## 1 Introduction

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### 1.1 Background and context

The manufacturing industry in India accounts for 25% of the national Gross Domestic Product (GDP) and 44.4% of commercial energy use. There is a significant level of coal and oil in the energy mix (50% and 30% respectively) with the power sector now producing over 700,000 GWH per annum. The thermal power sector's energy consumption is about 65% of the total commercial energy consumption of the industrial sector.

These energy intensive sectors are therefore prime candidate for energy efficiency initiatives, and are the target of the Government of India's proposed trading scheme in energy saving certificates.

The National Mission on Enhanced Energy Efficiency (NMEEE) has been initiated by the Ministry of Power (MOP) with the objective of enhancing energy efficiency in the country. One of the initiatives under NMEEE is development of a market based mechanism to drive delivery of additional energy savings cost-effectively. Following on from this, the GOI has outlined a proposed Perform, Achieve and Trade 'PAT' scheme for Mandatory Trading in energy saving certificates for energy intensive industries. FCO / DFID India has commissioned Camco, the Confederation of Indian Industry and ABPS Infrastructure Consulting to provide support to GOI's policy development by making recommendations based on a detailed operational review of international trading schemes, analysis and engagement with industry and international stakeholders, and economic / financial appraisal. The project also aims to support the GOI by providing analysis on the potential benefits and issues from linking the proposed PAT scheme to the international carbon markets, to assist the Government of India in considering the various options.

At the same time, it is fully understood that, given the energy security and cost saving benefits, the Government of India is committed to implementing the proposed PAT scheme irrespective of the state of the international carbon markets and the international climate negotiations.

The project deliverables / outputs are as follows:

- Report on lessons learned from the successes and failures of international policy experience on energy efficiency and emissions trading.
- Report on analysis of the risks and opportunities for mandatory trading in energy saving certificates in the Indian context – targeting 9 core sectors as identified by the GOI.
- Report on analysis of International and Indian stakeholders to inform policy recommendations on mandatory trading in energy saving certificates.
- Recommendations for potential policy design on extending trading in energy saving certificates (on either a mandatory or voluntary basis) – for example, to the 15 energy intensive sectors identified by GOI, alongside recommendations for securing carbon finance.

- Increased awareness within international government agencies, NGOs (WRI, E3G), and industry groups
- Increased awareness within Indian state and non-state actors on the details of the PAT proposals and development of acceptable mandatory trading proposals.

## **1.2 Explanation of the proposed PAT scheme and design observations**

### **Scheme coverage**

The proposed Mandatory PAT scheme will cover in excess of 700 installations in 9 energy intensive Indian industrial sectors. Usefully, alongside major industrial energy consumers (“downstream”) the proposed scheme includes large power stations (“upstream”), as these are large users of energy in their own right, and the application of a PAT target should serve to provide an additional focus on energy efficiency. Those installations covered by the scheme have been notified by the GOI that they are “designated consumers”. The Energy Conservation Act 2001 allows the GOI to introduce programmes that target improved energy efficiency.

The project consortium is currently working to quantify the “depth” of the scheme – i.e. within each sector, what proportion of energy production and consumption is covered by the covered installations. It should be noted that despite inclusion of the power sector (and other highly intensive energy consuming industries) in the PAT scheme, there are significant numbers of small, inefficient installations that will not be included within the PAT scheme.

There is scope in the future to deepen the scheme to cover additional (smaller) installations within the energy intensive sectors covered by the PAT scheme, or to broaden the scheme by including other sectors of the Indian economy. The project consortium are also calculating the potential of this broadening and deepening opportunity, but note that the immediate focus of the GOI is to establish an effective Mandatory PAT scheme as set out above.

### **Banding**

Given the wide variation of energy intensity across many of the 9 sectors, the GOI is likely to introduce a series of performance ranges as part of its approach to target setting. The approach will place installations in performance bands that are based on historical efficiency performance, and give each band an improvement target. In this way, all installations are likely to be required to improve, with the least efficient likely to be given deeper energy efficiency improvement targets.

This approach combines elements of historical performance and comparative benchmarking to establish targets that take into account current technology employed and historical performance (including early actions taken to introduce more efficient technologies).

Alongside this approach is a potential mechanism to introduce further fairness to the process. The GOI is considering setting targets based on the payback period of energy efficiency investments. One sector (or band within a sector) with low investment

(abatement) costs could be given a higher target than sectors with higher abatement costs and longer payback periods.

### **Energy efficiency versus “absolute” energy usage**

The PAT scheme as proposed is based on energy intensity rather than an absolute measure of energy usage. To translate energy intensity into absolute energy usage it will be necessary to multiply by actual volumes of production. The advantage of an intensity-based scheme is that it allows absolute energy usage growth while rewarding improved energy efficiency. A further advantage is that savings made “downstream” are not automatically of benefit to the upstream producers (as they are in the EU ETS). This is because the reduced consumption reduces the volume of electricity demanded from the power generation sector. It does not affect the intensity target, and so power producers do not benefit from downstream energy efficiency measures.

The PAT scheme will translate energy intensity performance into actual energy savings at the end of a period to enable the trading of a unit of energy saved: metric tonnes of oil equivalent (MTOE).

Many international emission trading schemes developed to date have focussed on “absolute” limits on emission reductions. The EU-ETS is an absolute (capped) scheme that can be viewed as a special-case intensity scheme (one where forecast growth is set at zero). The UK Climate Change Agreements have instead adopted (primarily) energy intensity targets.

We note that it is also possible under a capped scheme like the EU ETS to set an absolute (known/ex ante) target that allows for future economic (volume) growth.

### **Energy saving certificates vs energy usage allowances**

The second feature to note is that the proposed scheme will trade energy-saving certificates and not energy usage allowances. By contrast, the EU-ETS uses emission allowances (EUAs), rather than “emission reductions” as its base unit. By denominating the scheme in “energy saving certificates”, the certificates issued match the objective of the scheme – every *saving*, rather than targets on energy *usage*.

The notable difference is in the volume of units in circulation. Approximately 2bn EUAs (of any one vintage) circulate but the forecast “shortage” (i.e. the target overall emission reduction) is only c200m tonnes. Generally speaking, higher volumes will lead to higher market liquidity and less price volatility.

The use of energy saving certificates, coupled with an intensity-based target, has led the Government of India to adopt an ex-post allocation of tradable certificates. If the Government of India so wished, it would be feasible (though slightly more cumbersome) to instead denominate the scheme in “energy usage allowances” that could be allocated in advance.

The rationale for the adoption of an every savings unit is based on the decision to award energy saving certificates “ex-post” – i.e. once the savings have been made and verified such that there is low risk of erroneous (over) allocations of certificates. Issuance of certificates ex-post and in lower volumes (than energy usage allowances) may make the scheme more manageable.

There are some disadvantages of ex-post allocation of energy saving certificates:

- During the first period of scheme operating based on ex-post allocation, no certificates will be spot traded, dampening the market price signal. Though forward trading could take place, we understand that this is not going to be encouraged. In theory, business may react by over (or under) investing, leading to a sub-optimal allocation of capital and resources.<sup>1</sup>
- During subsequent periods, there will be energy saving certificates available for trading, though volumes will be lower compared to a system based on energy usage allowances. CCA experience indicates this could create liquidity, price discovery and volatility problems – with trading (and price spikes) concentrated around the compliance period of the year. If the objective of the PAT scheme is to raise awareness of EE measures that have zero (or revenue enhancing) marginal cost of abatement opportunities amongst industry then it is not necessary to focus of the “trade” aspect of the scheme. However, if the Government of India see trading as the optimal route to securing least cost energy efficiency measures, then the trading aspect (and market confidence in it) should be given appropriate consideration.
- When certificates are issued at the end of the first period, there will be mismatch between the quantity of certificates issued and the quantity demanded by underperforming sites. CCA experience indicates it is likely that firms generally over-achieve their targets, with industry surprising itself once focus was turned towards energy efficiency. With over-supply, the certificate price would fall to zero and trading would cease. While also true of other trading schemes in early phases, setting targets that will create a shortage of certificates is possible if the Government / regulatory authority has sufficient knowledge and political will to adopt robust targets during negotiation with industry.

There are several intervention mechanisms that can be used to reduce this issue, including banking, and Government supply-side intervention. These are explained briefly below.

#### **“Ex-ante” allocations vs “ex-post” allocation**

If denominating the scheme in energy usage allowances it would be possible to issue for free tradable certificates ex-ante (even in an energy intensity scheme where volumes are not known upfront). It would probably not be appropriate to allocate (at no cost to the installation) energy saving certificates in advance, as there is much less certainty on the quantum of potential energy savings than energy usage.

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<sup>1</sup> In practice, the experience from UK CCAs suggests that PAT will have a significant “awareness raising” effect, focusing the attention of business on a major uptake of cost-effective energy efficiency opportunities that are worth taking irrespective of the PAT credit price (i.e. that have a Net Present Value marginal abatement cost below zero, so energy saving is commercially beneficial even when there is a zero PAT credit price alongside the much more important energy price).

The upfront allocation would have to be based on a forecast / current / recent production volume that could be flexed (further allowances issued or cancelled) during the period. Under such an approach, Indian industry would be under an obligation to surrender a quantity of “energy usage allowances” equal to its energy usage during the compliance period, i.e. after it has reported actual installation performance against the PAT targets. To reduce the risk of cancelling over-allocated allowances, only a proportion of energy usage allowances would be issued in advance (with the remainder issued “ex post” – after reporting actual installation performance against the PAT targets). For example, a percentage (e.g. 50%) of allowances could be issued in advance with the remainder issued ex-post. A (low) percentage is necessary to mitigate the risk of over-allocation due to inaccurate growth forecasts.

One additional advantage of ex-ante allocation (where the certificates have value) is that they can be used to underwrite investments in energy savings technology.

### **An alternative to ex-ante free issuance: Auctioning**

An alternative mechanism for introducing price discovery and the ability to trade in the early phases of the scheme would be to auction a series of energy saving certificates (or allowances).

Auctioning either energy saving certificates or usage allowances in advance would improve liquidity in the tradable commodity (in the early years), price discovery and the ability of installations to make appropriate investments decisions. In-year trading would reduce the potential for a large under-or-over supply at the end of any given compliance period.

If denominating the scheme in energy saving certificates, the design of the auction process would need to carefully consider the expected level of energy efficiency / integrity of the PAT scheme. It would be necessary to either:

- Reduce by a corresponding number of certificates the “ex-post” issuance;
- Tighten the PAT targets upfront by an amount estimated to correspond to the number of certificates made available at auction;
- Use the auction revenue to buy and retire PAT allowances during the operation of the scheme.

### **Government intervention on the supply side of the scheme**

There are several advantages in creating a fund to allow the GOI to intervene in the PAT scheme, such that price volatility and extreme pricing equilibriums are avoided. This would be “at risk” to the Government, depending on the type and scale of the potential intervention. Ensuring a shortage of certificates or allowances (by setting appropriately “tough” targets) would help guarantee the rewards for those companies making investments in energy efficiency technologies.

A fund (comprising auction revenue, carbon finance revenue or international public finance) could be used to buy and retire PAT allowances when the PAT price is too low, thus maintaining an incentive to Indian industry to invest in energy efficiency and over-achieve PAT targets. Low prices have been a significant issue with trading schemes

(including the CCAs, UK ETS and EU ETS) – that there have been too many sellers and not enough buyers, resulting in low prices and the credibility of the market suffering.

### **Banking**

Banking allows an installation that over-achieves its target to carry forward excess certificates to a later phase. Banking is seen as a tool to encourage earliest possible adoption of new technology and enable over-achieving companies to carry forward the benefits of their investments in a situation where prices fall to very low levels.

Banking does however have the disadvantage of allowing a scheme to be “polluted” beyond the first phase if there is a large over-achievement by industry against phase 1 targets (as has occurred in the CCAs, UK ETS and EU ETS). The EU ETS phase 1 did not allow banking of allowances from phase 1 (2005-7) into phase 2 (2008-2012) – which, critically, has helped to preserve the integrity of phase 2.

### **Penalties**

We understand that the proposed penalty for failing to meet PAT targets (recognising that PAT targets can be met by buying sufficient PAT certificates to bridge any gap) will be proportional to the scale of the shortfall in meeting the PAT target – denominated in MTOE – multiplied by the unit cost of oil.

The EU ETS (and the UK CRC energy efficiency trading scheme, which begins in April 2010) similarly operate on a basis of proportional fines – of €100/tCO<sub>2</sub> (€40/tCO<sub>2</sub> in the introductory phase) plus the requirement to retire additional CO<sub>2</sub> allowances to bridge the gap. This approach to penalties has driven very high levels of compliance within the EU ETS. Given the Government of India’s focus on energy efficiency, it may also want to consider similarly adding (alongside the proposed fine) a requirement to retire PAT certificates to bridge any shortfall.

## **1.3 Definitions**

### **Mandatory / Voluntary distinction**

We note that the PAT scheme, whilst normally described as mandatory, has sometimes been referred to as a “Voluntary action”. To be clear, the proposed PAT scheme will be Mandatory for those designated consumers the GOI has notified. It will be binding under Indian law, with penalties for non-compliance (e.g. for those who fail to report basic data, or fail to buy sufficient PAT certificates to meet their PAT target, if they have not improved their own energy efficiency sufficiently).

The proposed PAT scheme is only “Voluntary” in the sense that it is a policy action that the GOI intends to progress irrespective of the outcome of International Climate Change negotiations (and, clearly, the GOI is not required by the international climate negotiations to have a PAT scheme). Nonetheless, the GOI is committed to implementing the proposed mandatory PAT scheme as a domestic measure within the context of the NAPCC, given the energy security and cost saving benefits (alongside the climate co-benefit).

### **Extending the PAT scheme**

The GOI could extend the scheme either on a Mandatory (or Voluntary) participation basis to additional installations, given the substantial energy security and cost saving

benefits from doing so. The GOI, if it so wished, could also decide to tighten the targets placed upon participants (again, on either a mandatory or voluntary basis), encouraging enhanced energy efficiency with covered installations. Under a mandatory approach, the GOI would decide those installations to be targeted (for example, applying to the 15 sectors regulated by the BEE). Under a voluntary extension, some incentives would need to be offered to encourage additional participation (or tighter targets). The UK CCAs have offered an 80% discount on the UK Climate Change Levy, resulting in extremely high levels of participation from UK industry – covering over 50 industry sectors (including steel, glass, cement, paper & pulp, chemicals, down to surface engineering and intensive pig and poultry farming).

#### **A CER = 1 tonne of carbon dioxide equivalent**

During this paper, we refer to a global unit of carbon currency as a “CER”. It is entirely possible that a new global agreement would create a new unit measurement for carbon, but we use the familiar CER to indicate a metric tonne of carbon equivalent.

### **1.4 International trading and energy efficiency schemes**

#### **European Union Emission Trading Scheme (EU ETS)**

The EU ETS is a mandatory emissions trading scheme covering over 10,000 energy intensive installations across the 25 Member States of the European Union. The Scheme is one of the EU’s key measures for delivering its commitments under the Kyoto Protocol and for delivering its objective of demonstrating leadership in reducing emissions of greenhouse gases. Phase 1 of the scheme operated from 2005 to 2007. Phase 2 started in 2008 and will last until 2012, and phase III will operate from 2013 to 2020.

#### **Climate Change Agreements (CCAs)**

CCAs are voluntary mechanisms that encourage energy efficiency in energy intensive industries in the UK. The Government has provided an 80% discount from the Climate Change Levy for those industry sectors that agree challenging targets for improving their energy efficiency or reducing carbon emissions. CCAs cover ten major energy intensive sectors (aluminium, cement, ceramics, chemicals, food & drink, foundries, glass, non-ferrous metals, paper, and steel) and there are over thirty smaller sectors with agreements. CCAs were introduced in 2001 and are set to expire in March 2013. However, the Government intends for the scheme to continue until 2017.

#### **CRC Energy Efficiency Scheme (CRC)**

The CRC is the UK’s mandatory energy saving scheme aimed at improving energy efficiency and reducing carbon dioxide emissions, as set out in the Climate Change Act 2008. It has been designed to raise awareness in large organisations and encourage changes in behaviour and infrastructure. The scheme will affect approximately 20,000 organisations, with around 5,000 of these required to participate in the scheme. The scheme is due to start in April 2010, with a three-year introductory phase.

#### **Tradable White Certificates (TWCs)**

Tradable White Certificates are part of mandatory schemes implemented in several EU countries, with varying scope. Under this mechanism, producers, suppliers or distributors of electricity, gas and oil are required to undertake energy efficiency measures for the

final user. A white certificate also referred to as an Energy Savings Certificate (ESC) or Energy Efficiency Credit (EEC), is an instrument issued by an authorised body guaranteeing that a specified amount of energy savings has been achieved. The targets vary with countries, due to fragmented markets with different objectives and policy responses. The Italian (Jan 2005) and UK schemes (April 2002) were the first to be implemented followed by France (Jan 2006). TWCs have been implemented or being considered in other EU member states.

#### **United Kingdom Emission Trading Scheme (UK ETS)**

The UK ETS was a voluntary emission trading system created as a pilot prior to the mandatory EU ETS. The scheme aimed to secure cost-effective emissions reductions and give UK companies early experience of emissions trading. Participants ranged from energy intensive industries to the service sector and encompassed both the public and private sector. The scheme ran from 2002-2006.

#### **UK Renewables Obligation (RO)**

The Renewables Obligation (RO) is the Government's main policy mechanism for incentivising renewable electricity in the UK. The RO places an obligation on UK suppliers of electricity to source an increasing proportion of their electricity from renewable sources. The RO was introduced in 2002.

#### **Regional Greenhouse Gas Initiative (RGGI)**

The RGGI is a mandatory scheme in the United States aiming to reduce greenhouse gas emissions. Ten Northeastern and Mid-Atlantic States have agreed cap and will reduce emissions from the power sector by 10% by 2018. Approximately 225 fossil fuel-fired electric power plants (25 megawatts or greater) are covered by the scheme. Emission permit auctioning began in 2008, and the first three-year compliance period began in January, 2009.

#### **New South Wales Greenhouse Gas Abatement Scheme (NSW GGAS)**

The NSW GGAS is a mandatory scheme aiming to reduce greenhouse gas emissions associated with the production and use of electricity. It aims to achieve this by using project-based activities to offset the production of greenhouse gas emissions. The scheme imposes benchmark targets on all NSW electricity retail suppliers, certain generators and all market customers that take electricity supply in NSW directly from the National Electricity Market. The scheme commenced in January, 2003.

#### **Chicago Climate Exchange (CCX)**

CCX is a voluntary, legally binding greenhouse gas reduction and trading system for emission sources and offset projects in North America and Brazil. The companies joining the exchange commit to reducing their aggregate emissions by 6% by 2010. CCX has more than 350 members ranging from corporations, educational institutions and government organisations. The exchange was launched in 2003.

#### **US Acid Rain Programme (ARP)**

The ARP is an initiative undertaken by the United States Environmental Protection Agency, aiming to reduce overall atmospheric levels of sulphur dioxide and nitrogen oxides, which cause acid rain. The program primarily targets coal-burning power plants. Phase 1 began in 1995 and Phase 2 began in 2000.

#### **China's Top-1000 Energy-Consuming Enterprises Program**

The National Development Reform Commission (NDRC) in China launched the 'Top-1,000 Program,' which targets energy efficiency improvements in the 1,000 largest



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enterprises that together consume one-third of all China's primary energy. The scheme was launched and aims to save approximately 100 million tons of coal equivalent in 2010.



## 2 Lessons learned from international policy experience

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### 2.1 Ambition and target setting methodology

To ensure an effective scheme design, targets need to be fair, realistic, provide clarity in terms of short and long-term actions, and most critically, make allowance for growth in developing economies.

**The need for consistent and comprehensive baseline data:** A key limitation experienced in the design of most international and national trading schemes has been the availability of reliable baseline data. During Phase 1 of the EUETS, the quality of data supporting the NAPs (National Allocation Plans) ended up being a critical factor to the success of the scheme. The generous allocation of allowances meant that Phase 1 had very little impact on carbon emissions across the EU, and the low carbon price failed to transform business strategies and technical processes<sup>2</sup>. Although current proposals under the PAT scheme are intensity based rather than absolute targets, this is quite a pertinent issue for the Indian scheme as well. Regulators are at an informational disadvantage in determining/ negotiating baselines with individual firms or sectors, but the aggregate effect of setting baselines too high for individual sources can undermine the effectiveness of a scheme.

The UK experience suggests that the reporting of data in the initial years of a trading scheme plays a critical role in target setting for future phases. The UK NAP in Phase 1 of the EU ETS built on the lessons learnt from the UK ETS. Caps were based on both top-down data from 'National Atmospheric Emissions Inventory' and bottom-up data from companies participating in CCAs. Retrospectively, it emerged that, unlike many other EU countries that greatly over-allocated allowances, the UK allowances in Phase 1 were largely in line with verified Phase 1 emissions. This approach is reiterated with the US Regional Greenhouse Gas Initiative (RGGI) emissions trading scheme, which has built on the success of the US Acid Rain Program (ARP) by limiting its coverage to plants that were required to report data under the ARP. This allows RGGI to account for emissions accurately, thereby facilitating a more effective scheme design. This is not to argue for limited coverage – but rather to highlight the importance of using data where it is available and, moreover, of allowing targets to be tightened if initial phase data shows they can easily be met.

**Benchmarking (making best practice comparisons) versus historical data to set targets:** Setting a target based on historical performance does not reward early movers. Using international best practice standards will reward the most efficient firms, but will be punitive on the least efficient installations which may have old technologies in place. A number of schemes, whether these be emissions trading (such as EU ETS or UKETS) or energy intensity based (such as CCAs in the UK) have used the grandfathering approach, wherein each organisation's target is determined relative to its historical emissions. In most instances, the targets were constructed using a 'bottom-up' approach, with each trade association collating information from individual companies regarding the potential for energy efficiency improvements<sup>3</sup>. However, allocations based on past

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<sup>2</sup> House of Commons, Environmental Audit Committee, The EU Emissions Trading Scheme: Lessons for the Future, 2007

<sup>3</sup> While this is true for most sectors, some sectors with a large number of facilities, such as food and drink, used a top-down approach to set uniform targets across all facilities as the bottom-up approach was considered too cumbersome.

emissions fail to reward early action. The 'benchmarking' and banding approach within the proposed PAT scheme overcomes this issue and offers a fairer approach with a higher degree of transparency for participants<sup>4</sup>.

One approach to target setting being considered for use in determining PAT scheme targets is to aim to keep payback periods for energy saving investments the same across all units and sectors. Achieving this aim in full will be challenging given the complex range of technological options across the various sectors and sub-sectors. Such a methodology for setting targets has not been attempted previously. It is an “equitable” approach that does not penalise early action, and will be most effective for industrial sectors that have a wider bandwidth in ‘specific energy consumption’ (SEC).

The GOI propose the use of 4 ‘bands’ within PAT (gold, silver, bronze and tin), with tougher targets for those in lower bands (giving credit for installations that have taken early action). Effectively, this may be seen as incorporating an element of comparative benchmarking (within each band). As performance within a sector or subsector converges, then it might be possible to move towards a single benchmark across all installations.

**Sector versus facility based approach to target setting:** One of the main considerations for any scheme is to keep administrative burden to a minimum for both the regulatory authority and the participants. Agreements with individual facilities will inevitably have high administrative costs. A sectoral target setting approach offers a simplistic solution, but at the risk of free-riding.

The experience with CCAs suggests that companies have been reluctant to enter into an agreement that incentivises or penalises collective action with only limited own-contribution. The majority of the sectors have opted for an umbrella agreement between the government and sector association, coupled with underlying agreements between the government and each company. A limited number of sectors have opted for underlying agreements to be retained and managed by the sector associations. For both these options, sector/ trade associations have a key role to play in terms of negotiating and/or managing these targets on behalf of their members. In Indian energy intensive sectors, the institutional capacity of sector associations to take up such a leadership role would need to be appraised in the Indian context.

**Clarity on long-term action required:** Clarity about the future of the tradable asset, and stability in policy parameters, is critical to the value of the certificates. Policy uncertainty fails to give participants clear long-term price signals and the incentives to make important investment decisions. Experience from the North American SO<sub>2</sub> market suggests long-term targets play an important role in setting prices in the short term.<sup>5</sup> The US sulphur market suggests decisions are made as far out as 6-9 years into the future. This explains the fact the EU ETS prices have not declined as much as expected despite the recession and accumulated surpluses. Long terms targets or anticipation of long-term demand, reduce market volatility.

Feedback from industry participants and government officials managing UK CCAs has highlighted the importance of periodic target reviews, which are based on learning from initial phases, technological advancements and a growing consensus on stronger climate action. In general reviews have been much less frequent than compliance periods, (4-5

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<sup>4</sup> See also Project Performance Corporation, Toward a US Emission Trading Scheme - Lessons learned and linkage to other systems, May 2009

<sup>5</sup> New Energy Finance, Carbon Markets – North America Research Note, 22nd October 2009

years for target reviews versus 1-2 year compliance periods). Review periods do add uncertainty into the regulatory framework, and can influence behaviour in the period prior to a review. The CCA reviews were initially seen as an opportunity to review targets (to the advantage of industry if the targets were proving too onerous) but were subsequently used by government to tighten targets.

**Intermediate compliance timeframes to enhance market liquidity:** Different approaches have been adopted in schemes to balance issues such as environmental integrity, monitor progress against targets and cost burden. Shorter compliance periods enhance market liquidity but tend to generally increase transaction costs and potentially the market price of the certificates. Regular reporting allows for effective monitoring against targets and early detection of any discrepancies. Penalties and incentives could be linked to intermediate compliance targets. In the UK, CCAs, are linked to the Climate Change Levy with a final 2010 penalty to pay back exemptions for the entire period, if the site fails to comply.

**Allowing for a growth metric:** Most current and proposed trading schemes work with absolute targets determined by an overall cap. However, a relative target is most relevant to the Indian context, given the anticipated increase in production across most industrial sectors. Further, a relative target is appropriate for EE, as it is the particular feature of carbon abatement in the EU ETS (and a desire to show real reductions in emissions) that has led to a preference for absolute targets. Relative targets eliminate the risk of increasing output levels and can also set benchmark entrance points for new entrants. The UK CCAs<sup>6</sup> demonstrate this approach with the majority of participants using relative targets.<sup>7</sup> i.e. site's primary energy consumption / unit of production determined based on historical levels of energy use.

**Target setting approach for Voluntary schemes and the integration with fiscal incentives:** Voluntary or negotiated target-setting agreements, with or without a trading element, have been used in a number of countries as an instrument to drive energy efficiency, particularly in the industrial sector. Targets could be agreed purely on a voluntary basis (such as in case of the Chicago Climate Exchange) or interlinked with energy/ carbon tax reductions, incentive payments or other regulations (as is the case with the Long Term Agreements in the Netherlands and CCAs in the UK). In case of the former, organisations that have signed up would have arguably undertaken emission reductions even if they were not part of the scheme, which raises the issue of additionality: delivering savings beyond 'business-as-usual'. Regulatory incentives such as tax relief and easier environmental permitting procedures provide a negotiating tool to push for higher targets and increase participation rates. The more successful programs – such as the UK CCAs – have doubled historical energy efficiency improvement rates. Some countries that established voluntary targets have strengthened their programs in subsequent phases through a range of incentives or added penalties<sup>8</sup>. The consultative process with the industry is an important step in arriving at the targets as has been the case with the UK CCAs. The importance of baseline energy consumption information,

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<sup>6</sup> CCAs are primarily aimed at driving energy efficiency rather than trading per se, but allow for emissions trading by interfacing with the UK ETS. As such, CCAs are a market based mechanism.

<sup>7</sup> Targets under UK CCAs could be relative, i.e. per unit of output, or absolute. Four types of targets could be adopted: GJ primary energy per unit of output, tons of carbon per unit of output, GJ primary energy or tones of carbon.

<sup>8</sup> Lynn Price, Voluntary Agreements for Energy Efficiency or GHG Emissions Reduction in industry: An Assessment of Programs Around the World, April 2005

even in case of voluntary schemes, cannot be undermined to assess energy efficiency potential and ensure incentives are tailored to the negotiated targets.

Although the overall experience with voluntary agreements has been varied, the most effective agreements are those that:

- are legally binding (whereby companies voluntarily enter into legally binding contracts)
- set realistic long-term targets that require annual monitoring and reporting
- include government support
- include increased regulation or taxes for those that do not volunteer (or at least the clear threat of such taxes / regulation)<sup>6</sup>.

## 2.2 Institutional capacity / governance

The institutional set-up varies considerably depending on the scheme design and local context. Key considerations for effective on-going stable scheme operation are institutional capacity, avoidance of conflict of interest between scheme administrator/regulator and scheme assessor, and where possible, integration with existing local institutions. In most circumstances, any conflict of interest between scheme administrator and assessor should be avoided to ensure that the scheme integrity is not compromised. Critical analysis of the Australian New South Wales Greenhouse Gas Abatement Scheme (NSW GGAS) highlights the conflict of interest in IPART (Independent Pricing and Regulatory Tribunal) being the Scheme Administrator as well as the Compliance Regulator, with responsibility for assessing the Scheme with respect to its objectives. Separation of powers between the ‘designer’, ‘operator’ and ‘assessor’ would reduce conflicts of interest, especially where the assessor is publicly reporting on outcomes that are relevant to public welfare and lead to review of the scheme design.

The governance role may be shared across public and private sector organisations depending upon how the targets are structured. Institutional capacity is critical to all actors in the overall process. Sector based targets will require sector/ trade associations to take a more pro-active role. The experience from UK CCAs highlight how sector associations act as a focal point of contact with industry, and can play a key role in the management and administration of agreements. They can also support members by providing them relevant advice and guidance<sup>9</sup>.

## 2.3 Simplicity in the scheme design and integration with other policy

Environmental (energy efficiency and emission reduction) schemes within Europe have been designed to meet differing policy objectives at different times over the past two decades. The result has been a series of policies (well conceived and carefully designed) that often have significant areas of overlap.

Within the UK, for example, one company may (at any one time) have installations that are (or were) covered inter-alia by the European Union Emissions Trading Scheme, the UK Emissions Trading Scheme, The Renewables Obligation, The Climate Change Levy

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<sup>9</sup> DECC, Consultation on the form and content on New Climate Change Agreements, March 2009

and Climate Change Agreements and, more recently, The Carbon Reduction Commitment. This is in addition to other environmental policies covering water, various wastes, hazardous products and the like.

The Government of India has an opportunity to develop the Mandatory PAT energy efficiency scheme such that additional (overlapping) legislation and policies are not required. It is inevitable that additional legislation will be required to address energy efficiency in smaller enterprises. Where this is the case, the use of an energy intensity scheme upstream (as opposed to absolute caps as in the EU ETS) means that issues of “double counting” will not arise. We note that in future, an issue could arise were India to decide to introduce legislation to tackle carbon emissions while the PAT scheme was in place (because fuel switching can have carbon impacts that differ from the efficiency of fuel utilisation).

Each of the schemes has been designed following significant consultation with industry and the general public. Economists and consultants have been used extensively in the research, design, implementation and review phases. Inevitably, questions, special cases and other detailed complications have arisen that have required specific design features to be incorporated. Within the CCAs, product mix changes and fuel supply interruption risk were originally included in the agreements as transitional concessions. There have also been review periods through which targets could be revised.

By way of further illustration, a key design feature within the UK CRC energy efficiency scheme – a new scheme in which 100% of the allowances will be auctioned, rather than given away for free – will be “performance payments” linked to company position in a published annual CRC Performance League Table. These performance payments are used to ensure the scheme is revenue-neutral to the UK Treasury, and to lower competitiveness impacts on UK business. Whilst this has added to the complexity of the scheme, making price discovery more complex, it provides for much stronger incentives (which, in turn, allows for Government to set tougher CRC caps) to drive energy efficiency improvement. UK Government has argued that these performance payments – linked to the Performance League Table – are key to motivating senior management on energy efficiency, as the CRC targets large non-energy intensive organisations where energy costs are typically just 1% of total operating costs. So, in this case, the additional complexity may be justified.

Overall, however, while certain special cases need to be considered in scheme design, and a degree of flexibility built into the regulatory system, it would be useful to consider the costs and institutional capacity required to implement a more complex scheme in the Indian context. This is especially the case where industry is at a low level of awareness and education about the requirements of trading schemes.

## **2.4 Monitoring, reporting and verification (“MRV” or MnV<sup>10</sup>)**

The desirable attributes of a successful MRV framework are consistency, reliability, accuracy, flexibility, low cost of implementation for both scheme participant and administrating authority, and rigour that allows a scheme to establish inter-linkages with other similar schemes.

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<sup>10</sup> Monitoring and Verification

**Data accuracy and reliability:** Auditing procedures are essential to the quality assurance process and reliability of the data. Audits could be carried out by the government agency administering the scheme or by third party verifiers, depending on the scale of the scheme and institutional capacity of the implementing agency. Standard electronic reporting formats, used in US Acid Rain Program (ARP) and a number of other schemes, allow for audits to be performed more effectively. Reporting and checking of problems on a more frequent basis within the overall compliance timeframe allows for errors to be spotted and rectified ahead of the compliance deadline, ensuring better quality and reliable data.

**Creating incentives for self-enforcement:** Experience from the US ARP and NO<sub>x</sub> Budget Trading Programs (NBTP)<sup>11</sup> has highlighted the benefits of strong quality assurance procedures, with built-in incentives for better accuracy and self-enforcement. This has included provisions for reduced quality assurance procedures to reward good performance, such as superior test results for monitoring equipment or alternatively progressively stringent missing data requirements. Establishing clear performance standards has been, however, fundamental to this process.

**Balancing accuracy and costs for MRV:** In designing MRV frameworks and systems, balancing the accuracy of determining real savings and costs of monitoring and verification has been most challenging, in particular for energy efficiency focussed schemes such as tradable white certificate schemes in the EU. Most white certificate schemes (e.g. UK EEC – now called UK CERT) tend to use an approach wherein energy/carbon savings are compared to a hypothetical reference scenario for each eligible technology. The UK CERT essentially places an obligation on UK electricity suppliers, requiring them (or their associated third parties) to install measures collectively worth the target carbon saving (where each measure – e.g. a new boiler – has a ‘tagged’ carbon saving associated with it).

Self certification is an important component of the UK CCAs that helps minimise MRV costs. At the end of each interim target period, individual facilities report to their sector association who carry out basic data checks. Both sector associations and individual sites are subject to audit by DECC, chosen on a risk assessment basis. Sector associations are audited in order to check that they can manage and handle the data correctly; and how the targets are developed from the information supplied by the individual units. Sites are audited to ensure they have correctly reported their energy and production data.

Verification by a third party is required only if an operator wants to sell its over achievement to another operator. After eight years, sector associations are operating at a high standard of accuracy. Site audits also show a high level of accuracy from self reporting, with very few errors of sufficient magnitude to change the status of a site as far as meeting its targets is concerned.

**Allowing for flexibility and different grades of accuracy:** CCAs allow for trading on the UK ETS market, and any over-achievement that is sold or ringfenced for offsetting against future targets has to be verified to convert it into allowances. Around 80% of the CCA companies have not traded using the ETS market while they have exceeded their target. This is attributed by some to high verification costs which have hindered their

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<sup>11</sup> John Schakenbach, Robert Vollaro, and Reynaldo Forte, Fundamentals of Successful Monitoring, Reporting, and Verification under a Cap-and-Trade Program, 2006

entry in the market.<sup>12</sup> We note that (given the low prices prevailing in the scheme) it is not necessarily straightforward to draw any definitive conclusion from the action (or inaction) of participants.

In other schemes, wider MRV approaches have been developed with different grades of accuracy and resultant costs to allow for greater flexibility. The Italian white certificate scheme has allowed three different evaluation approaches for determining energy savings - ex-ante, based on field measurement or an energy monitoring plan. Sample controls are carried out to ensure the guidelines are followed. The MRV provisions in the EU ETS are also designed to give considerable flexibility both to Member States and individual installations, with different tiers of methodologies and different degrees of assumed accuracy for different sizes of installations. US EPA (Environment Protection Agency) experience<sup>6</sup> from the ARP and NBTP schemes also suggests that a high degree of flexibility in the regulations is desirable although this usually comes at the expense of added complexity. To avoid unnecessary complexity a separate petition process for scheme participants to allow for any clarifications on rules was allowed for within these schemes.

**Establishing inter-linkages with other schemes:** One of the key considerations for linking schemes is enforcement of common standards. To achieve this, it is critical that MRV mechanisms are equally rigorous for schemes linked together, which may have an implication on the overall administrative burden. Policy makers can influence MRV costs significantly, particularly in a domestic scheme where few inter-linkages are intended with other international schemes. For instance, by only targeting emissions outside the EU ETS and CCAs, by exempting relatively small energy users, and taking a simple approach to the scheme rules (particularly monitoring and reporting), the proposed CRC scheme in the UK is expected to have a significantly lower administrative burden than the EU ETS.

In general, the MRV protocols for purely voluntary schemes tend to be much more simplified to keep overall costs and administrative burden low. However, any inter-linkages with a mandatory scheme (e.g via a deepening or broadening approach) in the context of the Indian PAT scheme would require MRV standards to be consistent. If no incentive (e.g. a tax break or payment) is offered, it would be difficult to encourage additional companies to participate voluntarily in the PAT scheme (especially for less energy intensive sectors). However, the UK CCAs show that if some incentive is offered, it would be possible to attract a wide range of participants into the PAT scheme, in addition to the mandatory “core” members.

## 2.5 Trading arrangements

Key objectives in the design of certificate markets are to enhance market transparency and liquidity and keep transaction and administrative costs low. The main considerations are size of the certificates or credits, having a standardised metric, validity of certificates, arrangements for ring-fencing, banking or borrowing, and implications on supply and demand.

The size of the certificate affects the prices and tradability. The smaller the size of certificates, the higher the administration costs. On the other hand, where the threshold is

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<sup>12</sup> Glachant, M & Muizon, G de, Climate Change Agreements in UK: A Successful Policy Experience?, 2006

set too high, certain technologies that deliver small energy savings may be excluded from the system. Emissions trading schemes to date have adopted a tCO<sub>2</sub> as the standardized metric. White certificate schemes in the EU have used fuel standardised, lifetime discounted kWh (UK EEC), kWh primary energy saved (Italy); or kWh lifetime discounted of avoided final energy consumption (France) which complies with the EU Directive on EE&ES (End-use Energy Efficiency and Energy Services). The CCAs use an energy or carbon metric per unit of output, for example, GJ/tonne or GJ/m<sup>2</sup> of product as the “target”. In order to trade, conversion calculations are made to translate the saving into tonnes of carbon dioxide (tCO<sub>2</sub>). The choice of performance metric may affect the fungibility of the scheme with other domestic and international schemes. Shorter lifetimes of certificates may significantly distort market prices as the market will tend to respond to short term demand and supply issues. Most schemes allow for borrowing and/or banking of excess savings across compliance periods – with the introductory phase an important exception to this rule. The fact that it was not possible to bank allowances from phase 1 of EU ETS into phase 2 prevented the over-allocation within phase 1 from “polluting” the integrity of phase 2 (i.e. the problem of phase 1 oversupply and low prices was usefully contained). The UK Government has applied this lesson in the design of the UK CRC – similarly forbidding any banking of allowances from the introductory phase into the subsequent phase. Over the longer term, however, the use of banking is perceived as being essential in building investor confidence and market stability, especially in multi-phase schemes such as the EU-ETS<sup>13</sup>. Such an arrangement acts as a price support for future phases of a scheme and enhances price stability at period ends. Banking/ borrowing will positively influence market liquidity and stability of prices but high levels (coupled with the expectation of price increase) may result in the hoarding of certificates. Therefore a restricted lifetime over two or more target periods is recommended. Where desirable, levies to banking and interest rates to borrowing may be considered to limit volumes.

## 2.6 Inter-relationships with other international / national schemes

Linking schemes on a bilateral or unilateral basis will require creating confidence that the traded certificates are at par in terms of both scheme objectives and effort/ costs. This will require increased transparency, accountability and enforcement of common standards. The choice of performance metric will also impact the ease with which proposed scheme interlinks with existing schemes.

Inter-linkages may be established based on certain pre-conditions being satisfied to ensure that the basic scheme objectives are not compromised while allowing for overall abatement costs to be kept within limits. The proposed CRC in the UK is intended to focus on organisations that fall outside the EU ETS and CCAs. It is intended to feature a “buy only” link (safety valve) to the EU ETS/ international (JI / CDM) carbon markets to ensure that CRC organisations do not face expensive abatement investments. RGGI also has a unilateral link with the mechanisms under the UNFCCC and with other approved emissions trading scheme if its allowance price remains above \$10. The RGGI cap is designed to build on, and expand state clean energy policies. The scheme focuses on the power sector and GHG reductions in the sector depend in large measure on a foundation

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<sup>13</sup> Sunderland J, Retrospective on Phase 1 of the European Union Emissions Trading Scheme (EU-ETS), 2008

of clean energy policies. Allowing for completely open and unrestricted open bilateral links with other international markets may fail to achieve what the scheme is inherently aiming for. This has parallels with the Indian context where energy efficiency in the Indian industrial sector is driven by wider issues of energy security.

There are precedents for overlaps between schemes with relative and absolute targets as has been the case between the CCAs and UK ETS (and now EU ETS) which may be of relevance in terms of how an Indian energy efficiency trading scheme could potentially interlink with international carbon trading mechanisms. CCA participants that over-comply can receive emission credits which can be traded (sold) on the UK ETS market. Alternatively, participants that under-achieve can buy emissions permits on the market to comply with their target. However, to preserve the environmental integrity of the UK ETS – to prevent the absolute carbon market from being “flooded” with credits from the relative intensity market – a ‘Registry Gateway’ restricted CCAs with relative targets in terms of the extent to which they could sell their over-achievement. Specifically, transfer of allowances between a relative participant and an absolute one has been allowed only where the net total flow of allowances towards the relative sector has been positive. In the case of the Indian PAT regime, over-achievement could potentially be sold into the international carbon market. Mechanisms to encourage scheme wide over-achievement are outlined in section 3.5. It is unlikely that over-achievement by individual installations will be sold externally, and indeed this has been provisionally discounted in the initial thoughts on PAT scheme linkages. Scheme or Government level international linkages were not considered and therefore discounted.

## 2.7 Securing participation and ensuring compliance

Mandatory trading schemes have been effective in securing industry participation through legal means, with powers to enforce penalties for non-compliance. The EU Emissions Trading Directive sets out how member states have the duty to ensure penalties are ‘effective, proportionate and dissuasive,’ for non compliance. Financial penalties are commonly enshrined in mandatory schemes: in the case of the EU ETS operators failing to surrender sufficient allowances in Phase I were penalised €40 per tonne CO<sub>2</sub> and in Phase II the EU increased the penalty to €100 per tonne CO<sub>2</sub>. For European White Certificate schemes, penalties range from explicit fines to a percentage of the non-compliant party's turnover. For the UK CRC Energy Efficiency scheme, non-participation will be a criminal offence. It is intended to rely on self-certification of energy use, with harsh penalties deterring abuse.<sup>14</sup> The proposed penalties for non-compliance will vary according to the severity of the offence, and like the EU ETS, are planned to become more stringent with subsequent phases.

In voluntary schemes, securing participation is primarily through tax reductions or lighter touch regulation for those that volunteer – which equally means a higher level of regulation or taxation (or at least the threat of this) applies to those that do not volunteer. The penalty for failing to meet the targets in UK CCAs is to lose the right to pay the lower rate of tax (CCL) for the following two years. The aim of this provision is to minimise the burdens on government and industry. If penalties were retrospective, companies would have to re-pay the difference in tax for the period, and this uncertainty

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<sup>14</sup> DECC, Final Impact Assessment on the Order to implement the CRC Energy Efficiency Scheme, October 2009

could have an adverse effect on their business. Voluntary schemes dealing with non-compliance without these mechanisms may have to rely on penalties for violating private contractual agreements. In the case of the Chicago Climate Exchange, these provisions provide for sanctions including fines and suspension of trading privileges when rules are violated, which could deplete goodwill and environmental reputation. However, these ‘weaker’ penalties have not been applied, calling into question the credibility of a voluntary approach that does not feature significant incentives (as opposed to an approach such as CDM crediting or the UK CCAs). To prevent opportunism and bad faith a credible and effective set of non-compliance sanctions are seen as not just important, but a necessity.<sup>15</sup>

China’s Top-1000 Energy-Consuming Enterprises Program provides an example of penalising non-compliance for public sector. In this program, regions and enterprises that do not meet the targets will not be given annual rewards or honorary titles, leaders in state-owned enterprises will not receive annual evaluation awards, and officials will not be promoted without meeting the energy conservation targets.<sup>16</sup>

## 2.8 Financial support for industry

The issue of fiscal incentives or taxation to drive participation rates and higher targets in the voluntary sector was discussed in the preceding sections. Taxes could be designed to be cost neutral for the government, and revenues used to either fund energy efficiency projects or provide tax reliefs elsewhere. This has worked particularly well in the UK where revenues from the CCL (Climate Change Levy), an energy tax on non-domestic end users, are used to partly reduce taxation on energy saving plant and machinery (Enhanced Capital Allowance) and partly to reduce labour taxes. An 80% discount on CCL is available for energy intensive industries that achieve their targets under the CCAs (Climate Change Agreements). However, the current structure for a discount from the CCL does little to incentivise industries to go beyond their targets (unless the marginal cost of abatement is negative)<sup>17</sup> and a sliding scale for tax relief could be a potential option.

Although taxation is considered an effective mechanism to drive participation rates, competitiveness is a key concern for industry. One of the implications of higher taxes is the risk of leakage, wherein organisations may decide to move the facility to another geographical region to avoid taxes. It is therefore important that any competitiveness concerns are adequately addressed through industry consultation. Feedback from participants in the UK CCAs suggests that although this was one of the major concerns for participants when the scheme commenced in 2000, current perceptions are that there have been significant competitiveness benefits as facilities become more energy efficient. Competitiveness benefits can arise from a combination of two factors - a number of no or low cost abatement opportunities that can be implemented within each sector and

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<sup>15</sup> Yang T, The Problem of Maintaining Emissions “Caps” in Carbon Trading Programs Without Federal Government Involvement: A Brief Examination of the Chicago Climate Exchange and the Northeast Regional Greenhouse Gas Initiative, 2006

<sup>16</sup> Price, L, China’s Top-1000 Energy-Consuming Enterprises Program: Reducing Energy Consumption of the 1000 Largest Industrial Enterprises in China, June 2008.

<sup>17</sup> Over-achievement could be traded but high verification costs and low price of carbon has meant that as much as 80% of companies with CCA target have not participated in the ETS market.

effective policy measures that would encourage organisations to take a long term view to minimising the energy intensity of their processes.

Fiscal incentives such as funds could be considered to support energy efficiency projects (such as through reduced interest loans) and promote clean energy technologies.

Incentives could be structured so as to incentivise action and penalise non-compliance.

Under the UK Renewables Obligation, non-compliance penalties<sup>18</sup> are collected in a 'buy-out' fund and redistributed to those suppliers that comply with their targets (with higher payments to those that have higher performance against their targets). This has resulted in the lifting the market price of the certificates higher than the penalty price.

The annual 'league table' within the new UK CRC – ranking organisations in terms of their energy performance, with CRC auction revenue recycled according to league table position – intends to work in a similar fashion. The RGGI uses revenue from auction of allowances to reduce electricity demand and deploy clean energy technologies, which are intended to reduce the cost of meeting the regional CO<sub>2</sub> cap and provide consumer benefits.

Other fiscal incentives could include minimum support prices. Minimum support prices allow participants to factor in the cost of energy /carbon in their investment decisions, especially in the initial years when there is likely to be a lot of uncertainty on the price of the certificates.

In the context of the PAT scheme, the GOI could auction at the start of each phase (or each year) a quantity of PAT certificates. Auction revenue could be placed in a PAT fund, and used to buy PAT certificates when they fell below a certain value. This would provide additional liquidity and security to the PAT market.

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<sup>18</sup> Buy-out price is stipulated for each megawatt hour of renewable electricity generated which rises each year in line with the retail price index.



## 3 Accessing international finance

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### 3.1 The availability of international finance

This section introduces some initial thoughts on how the Government of India might be able to secure international finance to support energy efficiency activities that are likely to lead to reduced emissions of greenhouse gases.

The international community of Annex 1 countries, through the Kyoto Protocol and associated programmes (both present and likely to be developed) will make finance available to support countries develop along a low-carbon path.

The PAT energy efficiency scheme is likely to have a carbon emission reduction potential (as a co-benefit of the targeting of energy savings) and the GOI / Indian industry would be able to reduce emissions if increased access to capital for clean-technology investment was available.

Several mechanisms for providing this finance have been set out. They include, broadly:

- International public finance
- Offset-based finance

“International public finance” is a collective phrase for the proposed provision of finance that is to be made available to developing countries by Annex 1 nations to help establish programmes to reduce emissions. The finance made available could be government to government, or be allocated through institutions such as the World Bank, EBRD, Fast Start Funds etc.

The distinction being made here is that International Public Finance provided under these potential programmes will not generate carbon offsets that Annex 1 countries can use to meet their climate change liabilities.

By comparison, offset-based finance will be made available on the understanding that emission reductions generated by the investment can be verified and ultimately transferred to an entity that will use the offset as a compliance tool. At present, the project-based flexible mechanisms (CDM and JI) are the most common offset-based programmes in operation.

It is of course possible that hybrid models will develop where IPF is used in the first instance to correct a market failure, and offset finance deployed later to implement projects. For example, IPF could be used to:

- build capacity within host countries that would enable national policies to be implemented
- fund research into locally appropriate mitigation technologies
- fund demonstration projects, or support the roll-out of new technology
- seed or de-risk private sector investment funds established to secure offsets from investments

The provision of International Public Finance or offset-based finance could “link” the PAT scheme to the International climate change architecture. It is important to note that the linking envisaged is much broader than the specific linking of two trading schemes

(e.g. linking the EU ETS to a future US ETS). Linking can be very loose and may simply be provision of funds to develop capacity within Governments to implement a national policy.

In this paper we use “linking”, “indirect linking”, and “connecting” as descriptions of how to create a bridge between the PAT scheme and the (carbon-based) objectives of international climate change policy. Offset-based finance creates a link between projects in developing countries and compliance-based trading schemes, as there is a direct relationship between the provision of funds and the underlying emission reduction performance. Finally, a mechanism through which PAT scheme energy saving certificates can be used for compliance purposes in other trading schemes would be a direct linkage akin to that being discussed between the EU and US trading schemes. While theoretically possible, this form of link is unlikely to be suitable in the short term.

### 3.2 Policy scenarios

The recent round of international negotiations at Copenhagen did not reach a global consensus on the successor to or the continuation of, the Kyoto Protocol. As such, uncertainty surrounds the way forward, and several different policy scenarios could unfold.

We note that given the energy security and cost saving benefits the Government of India is committed to implementing the proposed Mandatory Energy Efficiency PAT scheme irrespective of any international climate change agreement. Equally, the carbon markets are set to continue, with at least the EU ETS providing a key source of demand for developing country CDM carbon savings. Given this context, it may be possible to link the PAT scheme to the international carbon markets or other sources of international finance.

If international public finance was to be made available, it could enable the scheme’s administrator (GOI) or participants to access that finance to enable further efficiencies to be achieved.

This section sets out the different possible linkage options and at a high level, their potential benefits and difficulties.

*Scenario 1: A global climate change deal and comprehensive carbon markets*

Within a global agreement, it is likely that a global carbon-based currency would be established (similar to but not necessarily a “CER”) to enable least cost emission reduction opportunities to be identified by the market. We therefore describe two crediting mechanisms based on a common carbon currency.

- Project-based (“CDM”) crediting under the UNFCCC (or similarly constituted body)
- Policy-based crediting (again under the UNFCCC or similarly constituted body)

*Scenario 2: A patchwork of national commitments loosely co-ordinated at the international level*

No global agreement is reached, but the EU, US and other Annex 1 nations, in partnership with leading emerging economies such as India, China and Brazil agree to move forward with a range of bilateral agreements utilising a range of international financing mechanisms.

- Project-based crediting under a range of international / national standards
- Institution-level bilaterally negotiated agreements (e.g. between a developed country government and a developing country government)

We note that Scenario 2 has not been widely discussed at international meetings, and that there is still a strong desire to negotiate a global agreement. As such the linkage mechanism described under scenario 2 should be considered in terms of “indicative possibilities” rather than likely developments.

*Scenario 3: No international agreement, and only limited / ad hoc international collaboration*

Limited funds might be made available internationally, and therefore no linkage is foreseen. It is important that any potential international linkage mechanism does not impede the core functioning of the PAT scheme. The Government of India has made clear that PAT will proceed irrespective of the state of the international climate negotiations.

### **3.3 Linkage options under Scenario 1**

#### **3.3.1 Project-based (“CDM”) crediting (with high demand for CERs)**

##### ***Explanation***

Companies participating in the Mandatory trading scheme are able to access CDM finance to undertake projects that they would not otherwise have undertaken (the principle of additionality). If those projects improve energy efficiency then (as a by-product of the CDM investment) the project may also contribute to the company’s ability to meet its PAT scheme targets “in house”. For example, fuel switch from low-efficiency coal to new gas-fired boilers would improve both carbon and energy efficiency performance.

Some projects might not have EE co-benefits and would therefore continue to be wholly additional. For example, fuel switch projects might replace a high carbon fuel with a lower-carbon alternative, but may not result in an energy efficiency improvement. On-site renewable electricity generation projects (wind power, industrial waste gas or waste heat recovery) that replace grid-based power would not have EE benefits.

##### ***Benefits***

- CDM is widely recognised / and relatively well understood within Indian industry
- International and national institutional capacity is in place
- Some projects have entirely independent EE and carbon impacts

##### ***Drawbacks:***

- Project-by-project assessment of “additionality” has been criticised for its high transaction and administrative costs. Further, additionality concerns could deter some from seeking CDM finance
- Added (potential) complication that the mandatory nature of the scheme would lead to questioning of environmental integrity for some projects where hosts

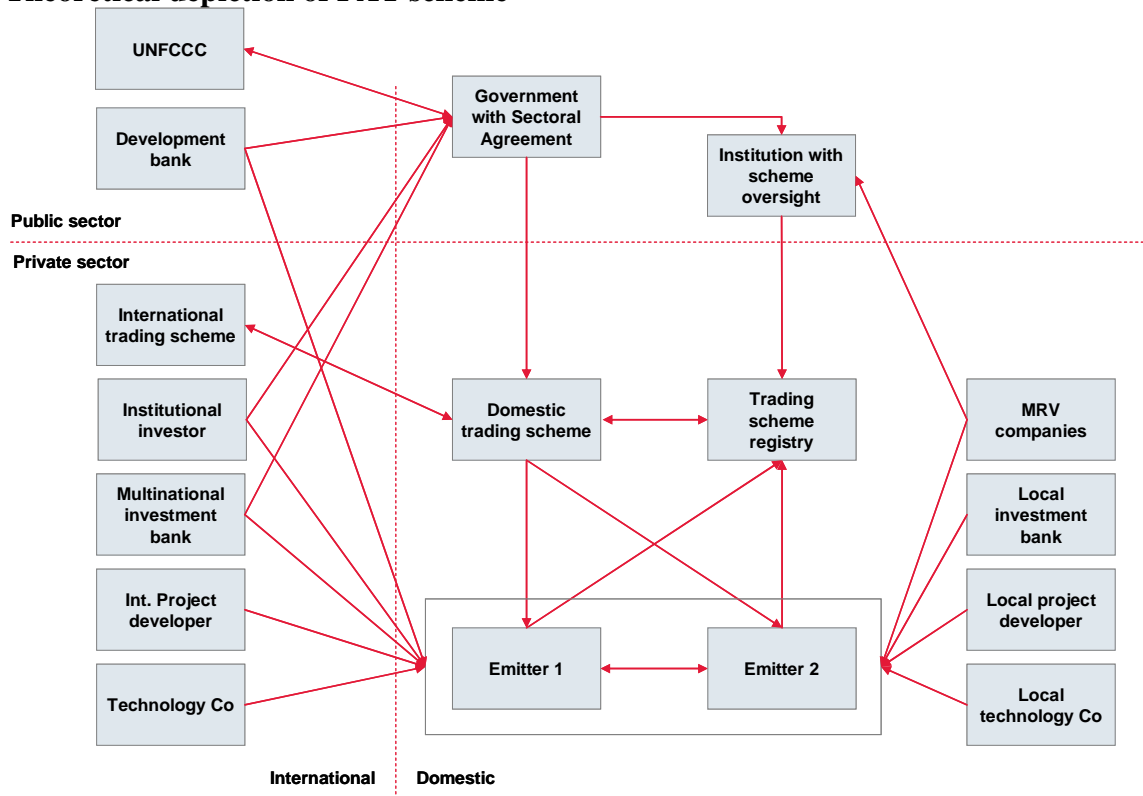
benefit twice from the same investment (firstly in terms of PAT certificates and secondly in terms of CDM credits)

### 3.3.2 The PAT scheme as a policy that can be credited

The GOI would develop the PAT scheme such that it could be credited. It would then agree to tighten or go beyond this level – action for which it could receive carbon credits. The Government of India would then be credited with the PAT scheme’s contribution to lower carbon emissions from the covered industrial sectors. The tightened PAT scheme would likely be credited with a number of CERs after the achievement of the tightened targets (i.e. ex-post), just as the GOI itself proposes to award PAT certificates to Indian industry ex-post.

The government could choose to forward sell these credits to create a cash reserve / investment fund (or it could choose to wait for the credits and take price risk, or it could choose to hedge the exposure by striking a balance between the two approaches). Volume risk would minimal if the scheme operates effectively and GDP growth is not significantly under/over-estimated.

#### Theoretical depiction of PAT scheme



The Government could choose to pass to industry the cash (or carbon credits) raised through a number of mechanisms – including direct allocations of credits or cash, provision of subsidised loans or accelerated capital depreciation allowances. The funds would support industry in meeting the targets.

Alternatively, the Government of India could use the funds to purchase (and potentially retire) energy saving certificates. This could keep the market price above a certain floor (providing certainty for investment decisions). By purchasing certificates, the Government would be (indirectly) rewarding stronger industry performers with an improved price for their excess certificates.

***Benefits***

- Issuance of credits to Government that can be used for a range of policy initiatives – the discretion would be with Government on how to allocated the funds
- The difference between BAU intensity and the PAT scheme target is “known” in advance and could be translated into a forecast carbon saving

***Drawbacks:***

- The translation of energy efficiency targets into expected carbon savings would be a challenge (though not insurmountable). It may be too problematic to attempt an ex-ante allocation (crediting in advance of the scheme on the basis of forecast energy efficiency improvement).
- If economic growth is over-estimated there could be an over-issuance of carbon credits (which are “absolute” rather than “relative”). However, this drawback could be addressed by the GOI receiving credits ex-post (i.e. after the PAT scheme has achieved, just as the GOI itself proposes crediting to Indian industry after they have met the PAT targets.<sup>19</sup>

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<sup>19</sup> Technically, it might be possible to do some partial ex-ante allocation (e.g. to allocate credits for 50% of the expected carbon saving in advance, with the remainder allocated ex-post. This would reduce the risk of an over-issuance of carbon credits.

*Using the PAT scheme to secure crediting under an international “no-lose” target (NLT)*

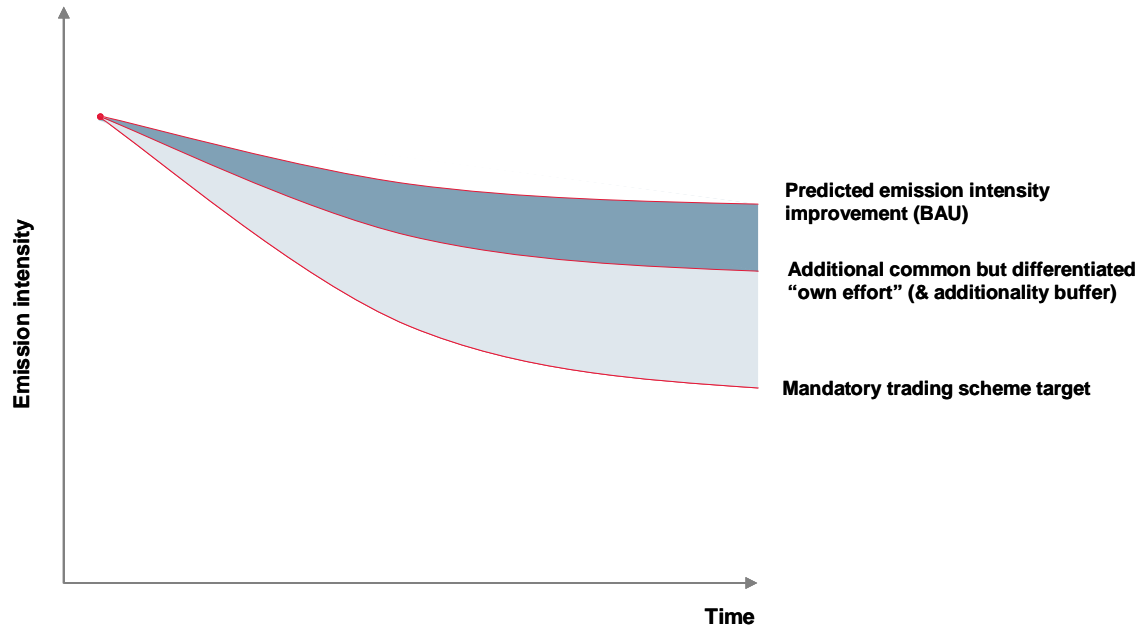


Figure 4.1 shows an intensity-based approach to setting a NLT and a domestic trading scheme. The Government of India establishes an intensity-based domestic trading scheme beneath a no-lose target - represented by the middle line. The agreed NLT is likely to be slightly underneath the BAU intensity (which is shown in this example to be improving over time). The gap between the top two lines represents “own effort” and reflects common but differentiated responsibilities (CBDR).

In order to go beyond its agreed target and be eligible for crediting, the government could establish a domestic trading scheme with a target below the NLT. The further below the no-lose target line the scheme is set, the more the government would secure in “carbon credit” revenue.

Given the scheme and the NLT is intensity-based, there is no guarantee of absolute emission reductions. However, if growth is forecast to be slower than emissions intensity improvement, for example growth of 5% p.a. and emission intensity improvement targeted at 10% p.a., then absolute reductions would be expected.

The NLT approach is a subset of 3.1.2 and therefore has similar benefits and drawbacks. It should be noted that the use of a domestic trading scheme underneath a no-lose target does not create any form of “national cap”. Rather, this approach gives the Government of India the opportunity to tighten the scheme in return for securing additional international finance.

## **3.4 Linkage options under Scenario 2**

### **3.4.1 Institution-level bilaterally negotiated agreements**

Governments or (for example), World Bank, private carbon funds or Buyer collectives (IETA), could partner with developing country governments to develop large project - or entire sector - emission reduction agreements.

One example that has been discussed within the existing round of negotiations is REDD. Partially because Forestry is not seen as a “competitive” sector, proposals have been made to develop mechanisms through which funds are provided to host governments to tackle deforestation (or encourage improved forest management activities).

Wider application of sector-wide carbon crediting could be envisaged whereby countries such as the UK (or private carbon funds) work with developing country Governments to develop investment / emission reduction programmes for certain sectors. An extension of the Near Zero Emissions Coal (NZEC) China programme would be an example of the EU working with China to support the roll-out of CCS technology. Such a programme could be “credited”, subject to appropriate agreement on MRV (given this Annex 1 financial support).

Returning to the Indian context, a programme / policy approach could equally apply to the PAT scheme. This could potentially be a large-scale crediting undertaking, requiring the international co-operation of several governments of carbon credits buyers. The issue of acceptable MRV is unlikely to be a problem, since the Government of India (and Indian industry) will want to have robust MRV within the PAT scheme to secure the desired energy efficiency benefits (given the energy security imperative) and also to maintain a working PAT trading market (i.e. those parts of Indian industry buying PAT credits will want to be confident that they are paying for real energy efficiency improvements).

### **3.4.2 Project-based crediting under a range of international / national standards**

The role of traditional CDM within a patchwork of international / national / bilateral agreements is not certain. With no internationally agreed consensus on project-based crediting, but some desire from with the US (in particular) and the EU to source carbon credits, additional project verification routes might develop. For example, the US EPA or Gold Standard organisations might be authorised by trading scheme administrators to create / issue credits for compliance in trading schemes.

While there is likely to be some demand from installations within the EU ETS and the US trading scheme, volumes (and prices) may be subdued. These risks mean that a continuation of CDM is most likely to focus on least developed countries or sectors that cannot be part of bilateral (sector-wide) agreements (see above).

The benefits and implementation difficulties of project based CDM would be similar to under the Scenario 1 policy outcome. It is possible that crediting of projects at installations that are also within a domestic mandatory (energy efficiency) trading scheme would come under increased scrutiny.

### 3.5 Mechanisms to encourage “over-achievement”

There are two broad approaches that could be utilised to secure “over-achievement”:

1. Reducing the supply of certificates in the market such that the scheme tightens (while the scheme is in operation). This could take a variety of forms:
  - a. Allowing the banking of certificates from one phase into the next would shorten the current phase (but increase supply in the subsequent phase)
  - b. Allowing an international link where certificates can be exchanged for EUAs or CERs (a strong and direct form of linkage)
  - c. Government of India buys back certificates (for example so that a minimum price is always achieved)
  - d. Private sector speculators who are not part of the scheme buy certificates and then exchange it for a carbon credit offset
2. Tightening the overall targets upfront or during a periodic review

Not all of these approaches are consistent with international public finance or offset finance models. Banking, for example is only a temporary removal of supply and should not be credited or otherwise financially supported. The direct linkage approach is most suited to an off-set based link, whereby energy trading certificates are exchanged for carbon credits. A buy-back programme could be funded by either IPF or a carbon credit finance flow (for every certificate purchased by GOI or the private sector buyer, X offsets are generated).

An upfront tightening of the scheme targets is an attractive alternative approach and could be funded either through credits or IPF. The advantage is that it provides greater regulatory certainty to the participants, and it can also be combined with any of 1a, 1b or 1c.

Generally, these “over-achievement” mechanisms work well where a “whole-scheme” approach to crediting is taken. 1b requires neither government nor project-based crediting as the link is “direct” into another trading scheme.

It is likely to be easier to negotiate and structure a tightening of the scheme (for example from the start of Phase 2) where the financial incentive through offset finance is provided direct to GOI. GOI can then determine how to use this finance to support industry make the necessary investment decisions.

### 3.6 Initial conclusions

- If it is considered advantageous to secure off-set based finance, then the policy scenario (global agreement vs patchwork of bilateral deals) is less important than the choice of whether to build a link through the scheme as a whole or the individual participants. The Government of India alongside the international community should discuss which approach is preferred.
- The apparent advantage of directly financing scheme participants may not be as strong as the advantages of crediting the PAT scheme as a whole. Scheme participants will have the necessary investment incentives made available through



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the trading scheme pricing signal, and there are complimentary policy tools that can help with securing finance (soft loans, accelerated depreciation etc.)

- Further questions to be discussed / answered: What would you have to do to the scheme design to make this work and what are the pros and cons of each approach
  - Participant incentives
  - MRV
  - Efficacy / integrity
  - Industry engagement / participation