Exploding the Myths of Sectoral Approaches
(and renaming them Sectoral Approaches, Agreements and Measures)

Peter Wooders, 15th February 2011

A wide range of understandings of what Sectoral Approaches (SAs) are, and claims of what they could achieve, have been made by a wide range of stakeholders over the years. This paper tests these – presented as 'myths' – against what could be achieved in practice – presented as 'realities'.

The paper finds that SAs are not dead – but that the realities differ greatly from the myths.

One important example is that the name 'SA' is a pejorative term to some important stakeholders: renaming of Sectoral Approaches to SAAMs (Sectoral Approaches, Agreements & Measures) – or some other variant – is strongly indicated.

Much of the analysis is based on results from Climate Strategies' 18 month project - *International sectoral approaches and agreements: case studies of the steel sector in China, India and Japan*.[1] This project deliberately focused the analysis away from the generic by looking at one key sector – steel – and three key countries for the production and consumption of this steel (China, India and Japan). The starting point for the three country case studies was to ask firstly what would work domestically, i.e. within the country. Whether this would lead to an international approach, or could in some way be internationalised through linking or common methodologies, followed. This differs from the conventional 'top down' approach, where it is assumed that an international agreement could be made and then implemented in all countries. A need for international agreement adds a further level of complexity and will almost certainly result in delays when compared to a domestic scheme.

In all three countries it is clear that the design of a practical, acceptable SAAM must start from the base of current, domestic policies and measures. It should use and be built on these, and only then can an international component be considered. There is little or no enthusiasm for an internationally agreed common solution – all three countries have very strong national priorities and sovereignty concerns.

Practical SAAMs are therefore likely to differ, perhaps very widely, by country. As such schemes are designed and implemented, how countries recognise the efforts of other countries will be an important consideration, in terms of both trade (competitiveness and leakage concerns) and how they feed into the wider international climate change negotiations. For even if SAAMs retain a domestic basis, there are a number of advantages for including an international dimension within them.

There is no strong momentum behind SAAMs. If they are to be implemented, they need further defining, selling and promoting, firstly at the domestic level and then at the international one.

[1] For more details on this project, and all reports and documents published under it, see: http://www.climatestrategies.org/our-reports/category/54.html

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List of abbreviations

CCS	Carbon capture and storage
CDM	Clean Development Mechanism
DPJ	Democratic Party of Japan
EScert	Energy savings certificates (within India's PAT scheme)
ETS	Emission Trading Scheme
EU	European Union
I&S	Iron and Steel
IATA	International Air Transport Association
IMO	International Maritime Organisation
MRV	Monitioring, Reporting and Verification
NAMA	Nationally Appropriate Mitigation Actions
NEDO	New Energy and Industrial Technology Development Organisation (of Japan)
PAT	Perform, Achieve, Trade
RDD&D	Research, Development, Diffusion and Deployment
REDD	Reduced Emissions from Deforestation and Degradation
SA	Sectoral Approach
SAAM	Sectoral Approaches, Agreements and Measures
SCM	Sectoral Crediting Mechanism
SNLT	Sector-no-lose target

Key messages

1. Renaming of 'SA' (Sectoral Approaches – a pejorative term to some) to 'SAAM' (Sectoral Approaches, Agreements & Measures) is advised.
2. There is little or no enthusiasm for an internationally agreed common solution. National schemes could be recognised under the UNFCCC as NAMAs.
3. There is no strong momentum behind SAAMs. If they are to be implemented, they need further defining, selling and promoting, firstly at the domestic level and then at the international one.
4. Whilst opportunities for SAAMs are strong in the energy-intensive sectors with internationally-traded products, there are also good opportunities for SAAMs in other sectors, including those that have little or no trade of products.
5. There are both political and practical reasons why SAAMs and Emission Trading Schemes/Carbon Taxes should co-exist.
6. SAAMs would be unlikely to have more than a marginal impact on competitiveness; this marginal impact could even be negative.
7. There are good reasons for holding more detailed discussions at the sector-specific level, and setting up a specialised forum –potentially within the UNFCCC- and providing it with technical expertise.
8. Two options for SAAMs could be taken forward in China: Sectoral crediting (SCM) on the basis of emissions intensities -sector no-lose target (SNLT); and Technology Crediting, both ex-post.
9. India wishes to strongly assert its sovereignty over climate change policies and measures. The Indian "PAT" scheme can be considered as a domestic SA.
10. Ensuring that breakthrough technologies and/or CCS are developed and implemented as quickly as possible would provide a good basis for a Japanese SAAM, with a fully-resourced plan of RDD&D a good candidate.

PART A: The Myths

A wide range of claims and understandings have been associated with Sectoral Approaches (SAs) over the years, by a wide range of stakeholders. No attempt is made in this paper to map the views of the stakeholders, and it is not considered that this exercise would yield much useful analysis. We can almost certainly conclude that those who comment on Sectoral Approaches tend to have a more positive outlook on what they may achieve than the average commentator would have. Ten myths are now considered.

1. SAs mean international carbon pricing and international trading of credits

They could do – but only in specific cases, and these may be amongst the hardest cases to get implemented in practice.

There have been many attempts to categorise SAs. The field of SAs can be very broad, and the literature covers policies, agreements and approaches which seek to create mitigation opportunities within a particular sector of the economy. The common theme is simply that they are based on a sector, rather than the wider economy or on specific enterprises.

Fundamentally, there are two key variables in categorising SAs: the *Parties to the Agreement*, and the *Target Type*. Table 1 identifies three classes of *Parties*. These range from a "top down" multilateral system, led by governments and most likely to be under the auspices of the UNFCCC, to a "bottom up" approach whereby nations set up their own schemes. Between these two extremes are the "transnational SAAMs", industry-led initiatives where it is the sector which sets up and manages its own scheme internationally.

Table 1 also identifies two broad classes of *Target Type*, those based on measuring and controlling emissions of CO_2 and sometimes other GHGs (greenhouse gases), and those that have indirect targets (typically technology penetration, but we could envisage a range of financial or other commitments). Emissions targets are either set on an absolute basis – i.e. are independent of the level of output of the sector – or, more commonly in SA proposals, are set on the basis of intensity. Here, targets depend on the level of output, and require an improvement in the average emissions per unit of production. Importantly, intensity targets do not act as a constraint on output.[2] Energy – again either on an absolute, or more often on an intensity basis – is sometimes used as an alternative to emissions.

Table 1: Categories of Sectoral Approaches, Agreements and Measures

PARTIES TO THE AGREEMENT		TARGET TYPE			
		Emissions (CO_2/other GHGs)		Indirect	
		Absolute	Intensity	Technology	Other
	Multilateral (governments) ***["Top Down"]***				
	International (industry led) ***["Transnational SAAMs"]***				
	National ***["Bottom Up"]***				

[2] Absolute caps on emissions are resisted by some stakeholders because they may act as such a constraint on output. This will only occur if the sector grows more strongly than expected and if there is no opportunity for the sector to meet its commitments by some other method (for example reducing its emissions at reasonable cost and/or purchasing allowances, again at a reasonable cost). Conversely, absolute caps can lead to gains if the sector does not grow as strongly as expected. Theoretically, absolute caps are more economically efficient at meeting a given level of emission reduction as they include the option of reducing output.

Table 1 contains twelve possibilities for types of SA, almost all of which have at least been proposed at some time or another. The most widespread international trading would occur if a multilateral agreement were made, with a large number of countries accepting absolute caps on their emissions (the top left of the twelve cells in Table 1). The case of sectors taking absolute caps across countries was rejected early in the Kyoto Protocol in favour of the most-developed countries taking absolute caps (across sectors). It seems highly unlikely that the option will be reopened for discussion within the UNFCCC or elsewhere: there is no strong support from within the developed country group, and often strong hostility against absolute caps being implemented within developing countries.

Any other SA option would almost certainly lead to much more modest trading, on a less international basis. The "transnational SAAMs" being proposed by bodies representing international sectors such as Iron & Steel, Cement and Aluminium tend to propose technology agreements and/or intensity targets. There is no conceptual reason why technology agreements or standards could not lead to tradable credits, but the process is complex and essentially unproven in practice. Setting baselines and targets, and assessing whether activities are 'additional' to what would have happened under business-as-usual, present both technical and political challenges.

Intensity targets occupy a large part of the SA debate. Credits from these could be generated by an international industry-led scheme, but could also be formalised multilaterally – through a sectoral crediting mechanism (SCM) or a reformed CDM (Clean Development Mechanism) – or could come from the "bottom up". NAMAs (nationally appropriate mitigation actions) are very prominent in the UNFCCC discussions, and some of the many options considered to provide international support for a national implementation of a NAMA involve systems whereby countries could generate credits for the NAMA implementation which could be subsequently traded. Credits from such schemes would be traded only if there were international demand: this would depend on the 'quality' of the credits generated, i.e. whether purchasers (who would almost certainly be in developed countries) believed that the credits were additional to normal behaviour and had been properly accounted for (using appropriate measuring, reporting and verification).

Some form of emissions intensity SA is probably the most likely to result in carbon credits, at least in the short term. Based on the analysis of the supply and demand sides presented above, the number of such credits is likely to be relatively low.

But there are also a whole range of alternative SAs which would not result in carbon pricing or trading of credits. Technology-oriented agreements are a key example, as are NAMAs with unilateral support (which would not generate credits under current proposals). It is also important to note that SAs may only be used to set targets for sectors, for example to allow a country to decide that the paper and pulp sector should reduce its carbon intensity by a certain percentage and the cement sector by a different percentage. Once the targets are set, the approach may be complete: to many Japanese stakeholders, for example, this is what the term 'sectoral approach' means.

SAs could mean international carbon pricing and international trading of credits - but only in specific cases, and these may be amongst the hardest cases to get implemented in practice.

2. Stakeholders have common understanding of SAs, and views on them

Table 1, and the discussion around it, noted that there are many types of potential SAs. Certain stakeholders associate SAs only with the UNFCCC, with sectoral crediting mechanisms (SCM) a particularly popular option within the debate (note for example the frequent mention of the "sector no lose targets" first proposed by CCAP[3], which would not penalise countries who did not meet their targets).

Many commentators view SAs as being a positive option, and expect them to be able to deliver significant GHG emissions reductions, whilst also delivering benefits such as reducing the impacts of differential carbon policy measures on competitiveness and leakage. These claims do not always stand up to close analysis (see sections below), but perhaps the more important divergence in views is between certain stakeholders in developed countries and certain others in developing countries. The argument is essentially around who should be responsible for mitigating GHG emissions: (some in) developed countries would like to see SAs act as a step towards an ultimate aim of a global carbon market, (some in) developing countries are concerned that SAs would lead to target-setting by stealth, or at least to the generation of data which would be used to negotiate stricter commitments with them.

The potential for conflict is strong, and the Climate Strategies team has been advised on many occasions not to use the term 'sectoral approaches' because of these pejorative connotations. It is recommended that another term, 'Sectoral approaches, agreements and measures' (SAAMs), is used in its place – it is throughout the remainder of this paper.

There are also interesting variations of views across stakeholder groups. While necessarily an approximation, business groups representing emissions-intensive sectors are very often in favour of SAAMs, reasons including their desire to see competitive conditions as level as possible across national borders and that it allows them to have sector-specific conversations with policy-makers. Certain economists and environmentalists argue that significant GHG emission reductions should also include the option of reducing the consumption of emissions-intensive products, and that many SAAMs as proposed (for instance those based on emissions intensity) do not give any incentive to do this.

A difference in stakeholders' views which is not prevalent in the current debate, but which has major practical application, results from national sovereignty. The second section of this Paper – "Realities" – demonstrates how important the issue of sovereignty is: all three countries which were studied in detail wished to see their national circumstances and preferences as part of a SAAM. Clearly these national characteristics vary widely, and hence so do views on what a SAAM should look like.

3. SAAMs are only applicable to energy-intensive sectors with internationally-traded products

Focus has been on largely on these sectors, notably steel – where 40% of production is traded internationally – and cement – which contains the highest level of carbon per unit of value of any major bulk commodity –, and hence whose price would be most affected by carbon pricing.

In practical terms, the more homogenous the product and the production method, the easier it will be to design and implement a SAAM. Cement is perhaps the easiest sector to deal with based on these criteria, followed by steel (which is complicated by having two primary production methods, the second of which –

[3] CCAP (Center for Clean Air Policy). 2006. Sector-based Approach to the Post-2012 Climate Change Policy Architecture. August 2006. Washington DC.

using recycled scrap as a feedstock in an electric arc furnace – only emits around 20% of the GHG emissions of the blast furnace route, but depends on the availability of scrap, which is limited). Other emissions-intensive sectors, such as pulp & paper, chemicals and refinery products, become increasingly harder to deal with for reasons including multiple products coming from a single plant and the trade of semi-finsihed and other emissions-intensive inputs between plants and countries.

The problems with overlaying differential carbon policies and measures onto traded markets are well understood, and there is a growing literature and debate around whether border carbon adjustment, free allowances and exemptions from policies and measures should be implemented, how they might be designed and whether they would be legal under the World Trade Organisation's rules. Partly because of these issues, proposals for SAAMs have been made for sectors where trade is either very low or not the central issue, such as electricity generation and forestry and land use (REDD is essentially a SAAM). Maritime and air transport fuels are heavily traded but their emissions occur largely at their point of use: the IMO and IATA amongst others have been considering SAAMs.

Whilst opportunities for SAAMs are strong in the energy-intensive sectors with internationally-traded products, notably steel and cement, there are also good opportunities for SAAMs in other sectors, including those that have little or no trade of products. It is in these other sectors where international SAAMs may prove easiest to take forward.

4. SAAMs would be applied on a widespread international basis, covering both developed and developing countries

Again they could be, but only in specific cases, and these may not be the easiest to implement.

Designing and implementing a SAAM at the national level already presents a series of challenges, notably setting system boundaries, setting baselines, generating a robust data set and ensuring that incentives for good (and bad) performance are experienced by the variety of organisations in the sector. But at least these issues can be played out within the domestic political environment, with trade-offs and deals made to set the level of effort a particular sector should make to reduce its emissions within a country's overall plans and priorities.

Making an agreement international adds technical complexities, brings the often-sensitive trade debate more to the fore and, if developed and developing countries are included, an agreement on the vexatious issue of common but differentiated responsibilities under the UNFCCC will almost certainly be needed. None of these issues are insurmountable, but the slow progress made at the recent UNFCCC COPs in Copenhagen and Cancun shows clearly how the need for international agreement can result in at least major delay.

It seems clear that national SAAMs would be more likely to be implemented than international ones. These national schemes could be recognised under the UNFCCC as NAMAs.

5. SAAMs would need international indicators and benchmarks

A common, and intuitive, viewpoint is that a SAAM should include the relative performance of an industry across the world, with the least emissions-intensive gaining from the SAAM relative to those that are more emissions-intensive. Underpinning this approach is a need for a common international indicator, for example

the tonnes of GHGs emitted to produce a tonne of crude steel, using an agreed protocol and a common system boundary.

The issue is easy to state in practice but there are major constraints to its implementation. On the technical side, complete and robust data sets, collected internationally to a common format, either do not exist or are only under collection and are partial in their coverage of an industry world-wide. But the political constraints may be more important: first, countries tend to argue that their industry is special in some way (for example local inputs are more emissions intensive, it generates large quantities of electricity on-site, there are social constraints restricting the closure of certain facilities); second, governments have a natural tendency to wish to see their industry selling credits rather than buying them; and third, governments are typically very sensitive to the worsening trade position of their industry relative to other countries.

The European Union (EU) has used benchmarking to set its allocation of free allowances for Phase 3 of its ETS (2013-2020). Myth 10 explores the issue, concluding that the process brought up technical and political challenges: nevertheless the benchmarks are now set. The benchmarks were designed to be internal to the EU and not with the aim of being applicable to outside countries, although some proposals have been made in the literature to use the benchmarks.[4]

There is no over-riding reason which would stop international indicators and benchmarks being developed, over a reasonable time period. But they are not always necessary for even an international agreement, which could for example be concluded on the basis of technical standards or differentiated levels of improvement using country-specific measuring systems. SAAMs which did not require them would have both technical and political advantages vis-à-vis implementation.

6. SAAMs and Emission Trading Schemes/Carbon Taxes are mutually exclusive

There is sometimes the perception that sectors should be governed by a carbon price (delivered via an ETS or a carbon tax) or a SAAM, but not both. There are both political and practical reasons why we may see them co-exist in practice.

On the political level, the EU already has an ETS and any SAAM would be superimposed onto this – the EU would not retreat from its ETS. Other countries and regions also have carbon or energy taxes, or are developing and implementing ETSs. It would be necessary to choose between, or at least integrate very tightly, SAAMs and carbon taxes or ETS only when the SAAM is based on creating a strong carbon price, i.e. when it resembles an ETS. In many cases we have discussed in this *Paper*, there would be no carbon price resulting from a SAAM or a carbon price may be limited in size and to the countries it applies in.

Practically, there is a growing realisation that carbon pricing alone may not drive the significant reductions in GHG emissions from energy-intensive sectors which are required if we are to meet large long-term reductions from the economy as a whole. Carbon pricing does provide useful signals and incentives, but many of the changes needed – carbon capture and storage (CCS) or breakthrough technologies – need step changes in investment and in RDD&D efforts and expenditure. If the large finance requirements are publicly sourced – which many commentators suggest they need to be[5] – then there would be a major challenge for

[4] See for example a proposal made to use the benchmarks as the basis for setting a standard on imports of certain commodities by Yvo de Boer of KPMG, December 2010.

[5] worldsteel, an industry association representing 85% of world production, concludes that "the steel industry cannot, on its own, be expected to fund the long-term research and development of new technologies to radically reduce steel's emissions. This has to be in a partnership with significant financial contribution from governments." (*Steel's contribution to a low carbon future. worldsteel*

finance ministers, even if public debt levels were lower than they are at present. A SAAM may make securing public finance somewhat easier if governments could argue that their investments were part of a co-ordinated sectoral effort which the industry and other stakeholders were fully committed to.

Finance is not the only policy which could support GHG mitigation. Complementary policies, such as social policy to facilitate the closure of small and inefficient plants or demonstration schemes organised on a national basis, are likely to be needed to develop and implement the changes needed (see Table 2 for an example).

The best set of policies and measures has some generic aspects but is also specific to each sector, with for example the needs of iron and steel varying from those in paper and pulp. A one-size-fits-all policy, i.e. the same SAAM for all sectors, is unlikely to be the best approach. This may be one of the reasons why discussions within the UNFCCC – which have been largely at the generic level rather than focusing on specific sectors – may not have made as much progress as was hoped for.

Whilst a single policy, or at least a well-coordinated and integrated set of policies, may be most economically efficient, there are practical and political reasons for why we may see carbon pricing and SAAMs co-exist in practice.

Table 2: Potential complementary policies (additional to carbon pricing) for the steel sector[6]

Abatement Category	Potential complementary policies
1. The closure of inefficient, highly polluting plant	Make payments based on faster reduction in production than current policy
2. Improving energy efficiency and carbon efficiency at existing, non-obsolete plant	Project-based scheme (e.g. continuation of CDM). Supplemented by financial support scheme, ideally low cost capital
3. Ensuring that new plant is built using best available technology	Consider partial investment credit (e.g. low cost capital) if new plant is best available technology
4. Increasing the use of recycled scrap	Make payments against increased rates of collection made, within the country only (to avoid leakage)
5. Adopting Carbon Capture & Storage (CCS)	Fund demonstration schemes, covering different technologies and transportation solutions
6. Developing and implementing breakthrough technologies	Fund R&D, ideally at a wide international level

7. SAAMs would eliminate or reduce competitiveness and leakage impacts

One of the most common myths with SAs is that they would equalise costs to industry internationally. This could occur, providing that:

position paper. Retrived 14 February 2011 from: http://www.worldsteel.org/climatechange/?page=2&subpage=1)

[6] International sectoral approaches and agreements: case studies of the steel sector in China, India and Japan – Emerging Policy Recommendations. http://www.climatestrategies.org/our-reports/category/54/264.html

i. all countries agreed to trade carbon credits under a common system. This was one of the original concepts of a SAAM (see Myth 1): that the sector as a whole would receive a cap on its GHG emissions, and would find the most cost-effective measures to meet this cap by undertaking actions in countries where they were cheapest;

ii. all countries apply allocation and other trading system rules equally, for example that they grant the same exemptions and quantities of free allowances;

iii. if countries also implement other carbon policies and measures, these must have an equivalent impact on costs in all countries.

These conditions could be met in practice, but only under a highly unlikely set of circumstances. The most important considerations were laid out in Myth 1: that if international carbon trading is extended, it would be most likely to be at a relatively low price and limited in coverage to only some countries; and that many SAAMs would not lead to a carbon price at all. We can add to these the observation that even where ETS has been implemented (e.g. the EU) or proposed (e.g. the US), the most emissions-intensive sectors have tended to be granted free allowances or other exemptions from facing the full carbon price, or it has been made clear that domestic policies and measures would only be implemented if accompanied by some sort of protection at the border. Furthermore, in cases where developing countries can sell credits for beating targets on a project (e.g. CDM) or sector (e.g. sectoral crediting mechanism), this may reduce the costs of producers in developing countries and exacerbate the competitiveness and leakage issues perceived by developed countries having more stringent climate change policies and measures.

It is entirely conceivable that we will see different national approaches to carbon pricing for the foreseeable future, for example with the EU having its ETS and the US discussing its approach. A SAAM covering for example minimum technical standards could be agreed between these two, but it would not fundamentally alter the key driver of competitive distortion: one party is paying a carbon price, and the other is not.

The carbon prices and coverage of trading that we would probably see under SAAMs in the near future would be unlikely to have more than a marginal impact on competitive distortions resulting from differential carbon policies and measures. This marginal impact could even be negative.

8. SAAMs have been/are being/will be discussed in detail at the UNFCCC

SAAMs have been loosely on the UNFCCC agenda over many years. An intuitive view would be that therefore detailed discussions have taken place, and will continue.

A closer examination reveals that there has been little detailed discussion, and that what has taken place has focused on high-level considerations. UNFCCC negotiators have not been presented with any detailed proposals for particular SAAMs and, at least regarding industry and power generation, have not had serious discussions at the sector-specific level (it is interesting that the REDD process, essentially a SAAM for forestry, has made progress and has had discussions at the sector-specific level).

Within the Bali Action Plan process (leading from the Bali COP in 2007 to Copenhagen in 2009), an effort was made to progress "cooperative sectoral approaches and sector-specific actions". This included asking Parties for their views on how SAAMs could be designed such that they were in the interests of developed countries, developing countries and all countries together, and the production of a list of eleven key design issues which SAAMs would need to meet in order to be implemented

(see Box 1). These efforts have not as yet led to any major breakthroughs, and there was no substantive discussion on SAAMs at the Copenhagen (2009) or Cancun (2010) COPs.

Detailed discussion on SAAMs has been notable for its absence within the UNFCCC. The most promising area for progress in the UNFCCC appears at present to be within the NAMA discussions.

Box 1: "Issues for Further Development" of Cooperative Sectoral Approaches, UNFCCC for the AWG-LCA and AWG-KP meetings, Barcelona and Bangkok, 2009[7]

0. *Purpose*
1. Criteria for eligible countries and sectors
2. Determination of sector boundaries
3. Treatment of potential leakage between sectors
4. Methodology and process for determining reference level (including preparation, submission, review, approval)
5. Monitoring, reporting and verification requirements for emissions
6. Issuance, allocation, management and accounting of credits/units
7. Means of engaging stakeholders (public and private)
8. Duration of crediting/trading periods
9. Carry-over of credits/units between periods
10. Eligible credits/units for purposes of achieving trading thresholds/targets
11. Consequences of not achieving a reference level, including facilitative measures
12. *Governance*

9. The UNFCCC is the best forum for discussing and developing SAAMs

The UNFCCC focuses on perhaps the key unresolved issue for sectors: what level of emission reduction should be targeted, and how should this differ between countries. Any other forum which discussed and developed SAAMs would, at some point, have to confront the climate change issue.

Conversely, other forums respond to other key issues of sectors: the *OECD Steel Committee's* semi-annual meetings aim to improve the environment for trading steel, reducing anti-competitive behaviour; the *Cement Sustainability Initiative* and *World Steel Association* focus much of their efforts at improving the sustainability of their member companies' operations; the *International Maritime Organisation* has a work programme dedicated to reducing local and global pollution from international shipping; *UN-REDD* aims to reducing emissions from "Deforestation and Forest Degradation in Developing Countries"; joint research and development programmes have been concluded for various countries, regions and sectors, including for steel the "COURSE50" programme in Japan and "ULCOS" in the EU; and at the national level, energy-intensive sectors in countries including Japan, Netherlands and the UK have concluded SAAMs governing energy and/or emissions, employing forums which bring together government, industry and other experts. In all these examples, the focus on sector-specific issues, framed in the terms that industry uses and understands, has been higher than under the UNFCCC.

There are good reasons for holding more detailed discussions at the sector-specific level,

[7] FCCC/AWGLCA/2009/INF.2.Add.2. This lists items 1-11; "Purpose" (0) and "Governance" (12) have been added by IISD.

and discussing all the issues that concern sectors – for example trade, subsidies and environmental regulation – concurrently with climate change. A specialised forum of this sort could be set up within the UNFCCC, and indeed an earlier Policy Brief from this Climate Strategies project[8] recommends investigating the setting up of a steel-specific forum within the UNFCCC and providing it with technical expertise. But other forums may be at least as useful and may be able to make progress more quickly.

10. It is the politics of SAAMs that are difficult, not the implementation

This is an implicit assumption behind many of the high-level proposals on SAAMs: once the political will is there, implementation would be straightforward. Generating the necessary political will is clearly a challenge, but so would implementation be.

A recent example of one of the difficulties has been the discussion around benchmarks for the third phase of the EU ETS (2013-20). The task was to define the appropriate indicator and its initial value for all sectors covered by the EU which were identified as being vulnerable to carbon leakage under the EU Commission's criteria. Despite all plants in these sectors already reporting their emissions under the EU ETS, the relative homogeneity of EU plants (at least in comparison to some other regions of the world), the large amount of data that the sectors already report and the existence of strong and well-organised industrial associations, setting benchmarks proved to be time-consuming (approximately two years' duration) and acrimonious.

The SAAM literature points to other key difficulties: defining the sector and its boundaries; possibilities of leakage between plants covered by the SAAM and those outside it[9]; developing and enforcing liability rules such that the plants and companies in the sector are incentivised to reduce their emissions and may be penalised if they hold back the sector's efforts; if trading of credits is part of the scheme, a whole set of modalities and financial systems need to be put into place; and, on a fundamental basis, the need for robust data sets which allow the necessary indicators to be measured. Industry associations including cement, steel and aluminium have made significant progress in defining their sectors and building up high-quality, plant-level data sets, but these remain incomplete in their overall coverage (participation is voluntary).

It is clear that progressing a SAAM from conception to implementation will take at least a few years. Data issues are surmountable, but there is likely to be heated discussion along the way around certain other issues and this may require provisions to be watered-down or otherwise changed in order to bring a SAAM to final implementation. The wider the scope of a scheme, notably geographically, the more difficult it will be to implement.

[8] International sectoral approaches and agreements: case studies of the steel sector in China, India and Japan – Emerging Policy Recommendations. http://www.climatestrategies.org/our-reports/category/54/264.html

[9] The Indian PAT scheme would exclude 48% of plants. See Part B for further details and the Climate Strategies web-site at: http://www.climatestrategies.org/our-reports/category/54.html for the full India report.

PART B: The Realities

SAAMs are not dead – but the realities differ greatly from the myths.

An 18-month research project by Climate Strategies explored these realities. It started with the premise that the work on SAs to date has been largely generic in nature and pitched at a high level, and that this has not resulted in specific guidance for those considering implementing SAs. The project asks the question: **What would a practical SA look like?** It focuses in on a single sector of economic and trade importance – steel – and on three key countries: China (responsible for almost half of world production and consumption), India (a country where enormous growth in the steel sector is projected) and Japan (a major exporter, widely acknowledged as a technology leader).

The starting point for the three country case studies was to ask firstly what would work domestically, i.e. within the country. Whether this would lead to an international approach, or could in some way be internationalised through linking or common methodologies, followed (an international dimension could offer many advantages - see Section C for more details). This differs from the conventional 'top down' approach, where it is assumed that an international agreement could be made and then implemented in all countries. The need for international agreement adds a further level of complexity and will almost certainly result in delays when compared to a domestic scheme.

In sectors such as steel, competitiveness and industrial policy concerns tend to be important and thus domestic political considerations are centre stage. The economic impact on the industry and other stakeholders, whether real or perceived, of policy is a key driver of the analysis as is industry structure and technological options. Summary results from the three country case studies[10], which are being finalised in the first quarter of 2011, are given below.

China Case Study Results

The Iron and steel (I&S) industry is key to China's economic development. The sector has grown very strongly over the past two decades and is projected to continue to do so for the next two decades, driven principally by large scale urbanization, rapid economic growth and industry shifting from coastal areas to inland China and strong increase of foreign trade. By 2030 production is likely to be around 900 million tonnes/year, around half of world production.

Previous work on SAAMs in China (5 studies have been reviewed) gives "a general assessment of SAs and the related emission reduction potential, but not on how to implement under a feasible framework". The Chinese I&S sector has large energy saving potential at low-cost, but is a more complex sector in terms of ownership, plant sizes, etc. than those in more developed countries.

SAAMs based on absolute emissions are not considered to be implementable at the current time, facing very strong challenges: generating sufficient political will to impose caps on a sector that could impact economic growth and development; calculating the correct target level (cap) for the sector, and allocating allowances under this; and developing data quality through MRV, which would require extensive capacity building and awareness in the sector.

Two options for SAAMs could be taken forward: Sectoral crediting (SCM) on the basis of emissions intensities; and Technology Crediting. Both would use ex-post crediting. A combination of the measures could be implemented to distinguish between steel enterprises and deliver sufficient incentives.

[10] All reports relating to the Sectoral Approaches project (*International Sectoral Approaches and Agreements: Case Studies of the the steel sector in China, India and Japan*) can be found on the Climate Strategies web-site at: http://www.climatestrategies.org/our-reports/category/54.html

A sector-no-lose target (SNLT) appears suitable for China but there remain barriers and problems. Defining the sector boundary and agreed unit of output need to be defined – a possibility would be restricting the sector's involvement to only blast furnace operations. Datasets are likely to be needed for at least most of the sector, which covers a multitude of companies and plant sizes. Providing an incentive for private sector performance requires government allocation of benefits and the possible use of penalties, which may be politically difficult to implement.

A technology penetration target looks attractive for China. Challenges include ensuring that technology performs as expected and developing and maintaining an effective technology list.

The study concludes that an international SAAM may be too difficult to implement, so it confines research to the domestic level. Carbon dioxide per unit of crude steel appears to be a good unit for an SCM; care is needed in setting targets because the future growth rate of the sector is highly uncertain.

I&S consumed 16% of Chinese energy in 2008, up from 13% in 2000, at three times the Chinese industry intensity average. Energy per tonne of steel has fallen by one-third over the past decade, due to stock turnover, closure of small plant and energy efficiency improvements. There remains a large difference between the best and worst performers. Chinese energy efficiency is worse than in advanced countries, due to factors including a very high share of blast furnaces in production, a significant share of small equipment and low penetration of many energy saving technologies.

The identified carbon dioxide savings potential is over 400 million tonnes CO_2 in 2020 and over 600 million tonnes in 2030. The CDM has made some progress in realising some of this potential, but only 21 CDM projects have been implemented to date, a small fraction of the investments required to realise the potential.

SAAMs have the potential to scale up mitigation options. To succeed in China, they must fit into the domestic target-setting environment. Many challenges to implementation remain, including the need for high quality, reliable data across the sector.

Key uncertainties are defining the industry boundary – notably when thinking of the many small plants in operation – and baseline uncertainty. Further research would be helpful in many areas, including: the implementation methodology, in particular the evaluation environment; improving emission inventories; enterprise level emission reduction potential and costs; stimulation of all stakeholders to perform their role; appropriate incentive mechanisms; MRV and carbon trading demo projects. Finally there is a pressing need for the development of the implementation mechanism.

India Case Study Results

India wishes to strongly assert its sovereignty over climate change policies and measures. It will resist international agreements which take away sovereignty and anything which would lead to finance leaving the country. There is thus a very strong preference for a SA which is developed domestically. It would therefore need to account for domestic political considerations and favour using and building on existing policies and measures.

The Climate Strategies work in India considered the possibility of the Indian "PAT" scheme being used as a domestic SA. **The "Perform, Achieve and Trade" (PAT) scheme is a new policy that India plans to implement in 2011 in order to increase energy-efficiency in nine high-carbon-emitting sectors of the national economy. It uses a market-based mechanism, covering more than 700 units and facilities whose energy consumption exceeds sector-specific minima. 52% of steel produced in India would be included**.

The iron and steel sector has a critical role in the success of the scheme as it represents 28% of Indian industrial GHG emissions. The first phase of the PAT is now scheduled for the three-year period 2011-14. Each plant or production facility will be given a target specific energy consumption (energy per unit of physical output). Plants which beat their target would be able to sell excess "EScerts" (energy savings certificates).

There is no guarantee that the PAT scheme will be implemented or what its impact may be. Clearly the price of ESCerts will be an important indicator of the incentive for industry to reduce its GHG emissions, but account should also be taken of the awareness effect – the extra attention that the scheme would give to energy efficiency in front of managers.

India has no plans to internationalise the PAT scheme. It could be linked into the CDM, if EScerts could have a carbon equivalent ascribed to them, but may also be in competition with it for investment. Further down the line, the PAT could be made into a NAMA, or at least be used as a proof of concept or that India is making serious commitments to reduce its GHG emissions.

The PAT is a sectoral approach. There appears to be a low level of awareness and expectancy of the PAT within Indian stakeholders, with some predicting it will become a command and control mechanism. Implementation by April 2011 is very challenging – starting with a single sector may be a good approach, and the iron and steel sector would be a good candidate. There is a danger of leakage to 48% of iron and steel production in SMEs, which are outside the PAT scheme. Technology standards could also be developed to assist the PAT, perhaps in conjunction with the World Steel Association.

Japan Case Study Results

Japan's steel sector is recognised as the world's most advanced technologically. There is little that could be done to improve energy efficiency or emission levels using currently available technologies. It would be possible to increase the use of scrap in Japan, for example by increasing net imports of scrap, but this would not decrease emissions from steel worldwide, as scrap is a very valuable commodity and is already collected at very close to maximum possible rates worldwide and is traded internationally.

Valuable contributions to emissions reductions could be made by the use of improved steels by downstream consumers and by the export of Japanese steel-making technology. Calculating reductions for these activities creates some technical difficulties and the debate on who should be credited for the emission reductions has controversial elements. The option of crediting reductions from changes to downstream uses of steel is not considered further in the study.

The potential use of offsets from reductions made abroad has significant support in Japan. Many commentators suggest that meeting the carbon commitments of the DPJ cannot be done using 'clear blue water', i.e. from reductions from within Japan alone. Largely for this reason, but also because of concerns over the cost of CDM credits and where profit from the scheme goes, Japan is also setting up a major bilateral crediting programme, with its own monitoring, reporting and verification (MRV) mechanism.

The use of bilateral credits is not considered to be central to the study. Reductions from the sector, from within its own boundary, will be required if Japan is to meet reductions of 50% of more in GHG emissions by 2050. The precise figure for the steel sector has not been assigned within these reductions but it will be significant. Current, non-captured emission levels per tonne of steel from blast furnaces are not sustainable if deep cuts in national emissions are required: other sectors, which would equally be required to make large reductions, would find it extremely difficult to go further and offset continuing emissions from the steel sector. Assuming steel production remains at around today's level, this will require a major improvement in the primary steel production process – currently blast furnaces fed predominantly by coke – and/or by the capture and storage of carbon dioxide emissions (CCS).

By focusing only on what the Japanese steel sector could reduce from within its own boundary, the study is concentrated on the longer term. Bilateral offsets would also be available in the shorter term, and would be of most interest if they could be shown to assist with the development of the technologies Japan will need domestically in the longer term. Conclusive evidence has not been seen to illustrate this effect, but it is possible that bilateral crediting could support long term technological development and implementation in Japan. Alternatively, where bilateral credits are clearly additional to business-as-usual (for example CCS fitted to coal plant in Indonesia), there may be a case for including them within a SAAM.

Japan, in common with a number of other countries around the world, already has a series of policies and measures governing the steel sector in general and its GHG emissions in particular. Of note are:

- the Keidanren's Voluntary Action Plan on the Environment, and its successor, Commitment to a Low Carbon Society, with their progressive voluntary targets on energy efficiency;
- the APP (Asia Pacific Partnership)[11], whose work on the steel sector has involved identifying technology options and improving opportunities for its members to invest in each other's economies;
- the energy and carbon tax, which applies to coal and petroleum products purchased by industry.

Amongst any number of future policies which could be implemented are federal and prefecture-level ETS (Emission Trading Schemes), which are currently under discussion in Japan. The 'Basic Law' discussion held in the Japanese Diet in the final quarter of 2010 essentially precluded the possibility of a Federal ETS in the near future. The Basic Law is expected to lead to a new, economy-wide carbon tax, whose precise level and the destination for the revenue raised are expected to be finalised during calendar year 2011. The new 'environment tax' may see revenues being hypothecated, much as the current 'coal and petroleum tax' levied on industry is used to finance NEDO, who in turn finance programmes such as COURSE50 (an RDD&D scheme for the steel industry).

The discussions around the new environment tax illustrate the key issue of hypothecation: will it be possible to levy new charges, and can these be fully or partially redirected to the benefit of the sectors on how they are levied. Consistency with the 'polluter pays' principle must be matched against political realities, including Japan's industrial policy and the strategic importance it places on the steel industry.

The SAAM developed in this study argues that Japanese steel sector GHG emissions can only be reduced to sustainable levels through the successful development and implementation of breakthrough technologies and/or CCS. This could happen under business-as-usual activities – R&D efforts are underway, Japanese steel companies are aiming to develop new technologies for future markets and a range of activities on CCS are being undertaken. This study argues that a better approach is to **set the aim of developing and implementing these technologies as quickly as possible**.

Two variants are proposed:

1. implement a fully-resourced plan of RDD&D to develop breakthrough technologies and CCS by certain dates, with companies needing to meet minimum levels of effort.
2. regulate CO_2 limits such that steel plants exceeding these could not be constructed or operated after certain dates, leaving industry to pursue its own RDD&D path.

The first variant requires the identification of funding and a plan for its expenditure; the second leaves actions and their organization to those involved in the Japanese steel sector. Preliminary calculations indicate that there are sufficient resources generated within the sector to devote a larger share to RDD&D. Whether this would be

[11] And its successor agreement – the APP Steel Task Force is currently being wound down with a replacement body being set up in Paris. It is expected that its terms of reference will be similar to those of the APP.

effective, and whether a scheme could be designed and implemented with appropriate incentives to desired behaviour, remains unclear. Key issues are who would be responsible for finance – government, industry, or a combination – and who would be liable for meeting targets. The Climate Strategies study in Japan is nearing completion. In its final stages it seeks to develop the details needed to allow a debate on the potential implementation of the two variants, notably the potential funding mechanism for both the public sector and private sector options and to consider whether CCS remains an option by further analysing the sequestration and transport of captured carbon, including whose responsibility the development of this option should be. Further consultation will be undertaken, notably after the Basic Law considerations in the Diet become clearer, and the idea of Japan putting forward this proposal as one that could be made more international, using forums such as the OECD Steel Committee and the World Steel Association, will be explored.

PART C: Conclusions and Next Steps

Common themes and conclusions

In all three countries it is clear that **the design of a practical, acceptable SAAM must start from the base of current, domestic policies and measures.** There is little or no enthusiasm for an internationally agreed common solution – all three countries have very strong national priorities and sovereignty concerns. But including an international dimension should not be discounted. It could be advantageous for a number of reasons: it would be more amenable to gaining UNFCCC recognition; co-operation between countries could drive technological progress, finance and transfer lessons learned; it would enable the co-ordination of national trade policies and dealing with multinationals and investments which could be located in many countries; and it would enhance trust-building and competition between countries.

The renaming of Sectoral Approaches to SAAMs (*Sectoral Approaches, Agreements & Measures*) – or some other variant – is strongly indicated: SA is a pejorative term to some important stakeholders.

Practical SAAMs are therefore likely to differ, perhaps very widely, by country. As such schemes are designed and implemented, how countries recognise the efforts of other countries will be an important consideration, in terms of both trade (competitiveness and leakage concerns) and how they feed into the wider international climate change negotiations.

How can Sectoral Approaches, Agreements and Mechanisms be taken forward?

The approach of the Climate Strategies project – asking what a practical SAAM could look at, and starting analysis at the domestic level – has been shown to work well.

The study identifies that policymakers in countries around the world need further details in three main areas:

- **Defining** the SAAM. Its boundaries, targets, timelines, and other details (see Box 1 for a list based on UNFCCC analysis in the run-up to COP-15 in 2009). Liability – should government or industry, individually or jointly, be liable for financing the SAAM and for meeting the targets it contains? What would be the financial impacts on industry players and other stakeholders?
- **Selling** the SAAM. SAAMs will not come about on their own – support for them tends to be isolated and in many cases policymakers are either unaware or disinterested in them. They must therefore be sold. Selling points differ by country and can include that: they reduce production costs and hence improve competitiveness; they are cheaper to industry than an energy/carbon tax or an ETS (Emission Trading Scheme); they help a country gain technology leadership, leading to potential exports; they contribute to green growth and a green economy; they reduce exposure to fossil fuel price rises, and improve energy security of supply; they demonstrate a country's actions to mitigate climate change;
- **Promoting** the SAAM. Despite the need for SAAMs to be developed firstly on a domestic basis, international discussions and agreements would be extremely helpful. A country implementing an ambitious SAAM needs to know that the gains it makes will not be fully or partially offset by it losing markets to competitors with lower standards; and there is much to gain from countries sharing experiences and co-ordinating their SAAMs as much as possible (and thereby levelling the playing field as much as is possible). Climate Strategies *Policy Recommendations* paper published in August 2010[12] identifies that there is a need for detailed international discussions on steel, and concludes that these

[12] International sectoral approaches and agreements: case studies of the steel sector in China, India and Japan – Emerging Policy Recommendations. http://www.climatestrategies.org/our-reports/category/54/264.html

could be met within a specific negotiating forum at the UNFCCC. There are many advantages to using the UNFCCC, but if this is not possible then the OECD Steel Committee WTO, World Steel Association or some other forum could also be used. Whatever the forum, it will need a group of 'champion' countries to push forward the need for discussion, identify a forum and secure a negotiating mandate.

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