

ASSESSING THE STRUCTURAL CAPACITY REQUIREMENTS THAT WOULD ALLOW DEVELOPING COUNTRIES TO PARTICIPATE IN EVOLVING CARBON MARKETS

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GLOSSARY

| | |
|-----------------|---|
| ACAD | African Carbon Asset Development |
| ADC | Advanced Developing Country |
| AMC | Advanced Market Commitments |
| BAU | Business As Usual |
| BCT/CTB | Belgische Technische Coöperatie/Coopération Technique Belge |
| BEST | Benchmarking and Energy Saving Tool |
| CBC | CDM Benchmark Coordinator |
| CCAP | Center for Clean Air Policy |
| CCPC | Climate Change Policy Committee |
| CCPO | Climate Change Projects Office |
| CCS | Climate Change Secretariat |
| CCU | Climate Change Unit |
| CDM | Clean Development Mechanism |
| CER | Certified Emission Reduction |
| CSI | Cement Sustainability Initiative |
| CDM EB | CDM Executive Board |
| CO ₂ | Carbon dioxide |
| COP | Conference of the Parties |
| COP/MOP | Conference of the Parties serving as the Meeting of the Parties |
| CPF | Carbon Partnership Facility |
| DC | Developing countries |
| DNA | Designated National Authority |
| DOE | Department of Environment |
| DP | Development Partners |
| DoM | Department of Meteorology |
| EB | Executive Board |
| EC | Energy Commission |
| EE | Energy Efficiency |
| EIA | Environmental Impact Assessment |
| ENRC | Environment and Natural Resource Council |
| EPA | Environmental Protection Agency |
| ETS | Emission Trading System |
| EU ETS | European Union Emission Trading System |
| FAO | Food and Agriculture Organisation |
| FCFP | Forest Carbon Partnership Facility |
| FITs | Feed-in-tariffs |
| GHG | Greenhouse Gas |
| GHGI | Greenhouse Gas Inventory |
| GNI | Gross National Income |

| | |
|--------|--|
| IEA | International Energy Agency |
| IPCC | Intergovernmental Panel on Climate Change |
| JI | Joint Implementation |
| LBNL | Lawrence Berkeley National Laboratory |
| LCGP | Low Carbon Growth Plans |
| LIDC | Low Income Developing Country |
| LDC | Least Developed Countries |
| MAPS | Mitigation Action Plans and Scenarios |
| MDGs | Millennium Development Goals |
| MIDC | Middle Income Developing Country |
| MEST | Ministry of Environment, Science and Technology |
| MoE | Ministry of Energy |
| MRV | Measurable, reportable and verifiable |
| MWE | Ministry of Water & Environment |
| NAMA | Nationally Appropriate Mitigation Actions |
| NAPA | National Adaptation Plan of Action |
| NCCC | National Climate Change Committee |
| NCSA | National Capacity Self Assessments |
| NDC | National Democratic Congress |
| NDPC | National Development Planning Commission |
| NEMA | National Environment Management Association |
| NPA | National Planning Authority |
| ODA | Official Development Assistance |
| PDD | Project Design Document |
| PIN | Project Idea Note |
| PoA | Programme of Activity |
| QELROs | Quantified Emission Limitation and Reduction Objectives |
| RE | Renewable Energy |
| REDD | Reducing Emissions from Deforestation and Forest Degradation in Developing Countries |
| SSA | Sub-Saharan Africa |
| SCF | Strategic Climate Fund |
| SNLT | Sectoral No-Lose Target |
| TA | Technical Assistance |
| UCB | Uganda Carbon Bureau |
| UIA | Uganda Investment Authority |
| UNDP | United Nations Development Programme |
| UNEP | United Nations Environment Programme |
| UNFCCC | UN Framework Convention on Climate Change |
| WB | World Bank |

EXECUTIVE SUMMARY

The international community agrees that current carbon market mechanisms will need to evolve significantly in order to achieve the much needed global Greenhouse Gas (GHS) mitigation targets. **The aim of this paper is to set out the structural capacity necessary for developing countries to participate in these evolving market mechanisms.** Capacity building is defined as the preparatory activities required to link countries, sectors, projects and/or businesses to carbon markets and allow them to participate in evolving carbon market mechanisms.

The first part of the study looks at the capacity needed for developing countries to participate in each of the current and future carbon market mechanisms; from the current Clean Development Mechanism (CDM), including Programmatic CDM, to a reformed CDM and towards mechanisms such as Large Scale Crediting and Trading. Throughout the paper there are a number of recommendations promoting the establishment of institutional bodies at the developing country level which could help facilitate the aggregation of data, technical expertise and other necessary capacity for increased carbon market participation. The set up of such institutional entities will support the aggregation of different levels of capacity and be sufficiently flexible to develop over time with new market mechanisms as they evolve. The main body concludes with a summary of these institutional recommendations and a pathway analysis illustrating the capacity requirements at each carbon market mechanism level. This analysis is followed by two in depth country case studies: **Ghana and Uganda.**

Capacity requirements for evolving market mechanisms are analysed by looking at the capacity for data management, institutional capacity and policy level capacity. Capacity needs are either government led or emitter focused depending on the type of mechanism.

In order to participate in the **current CDM**, developing countries must **develop the institutional capacity in public and private entities to handle the entire CDM cycle** from project identification, writing of the Project Design Documents, successful registration, implementation and monitoring of projects. **The set up of a functioning Designated National Authority (DNA) is essential.** In addition to this institutional set up, governments will need to ensure that there is a pipeline of CDM projects and mitigation opportunities available and that the incentives for the private sector to develop them are created through effective policies and regulation.

Programmatic CDM (PoA) requires the additional capacity of selecting and defining the Managing Entity of a programme from either a public or private entity. The Managing Entity's duties and responsibilities go beyond those of project developers in the traditional CDM.

The CDM is expected to evolve over time as reforms are introduced to improve the way it functions. One reform currently under discussion is greater use of 'standardised approaches' where projects would be compared against a pre-determined standard which is derived from assessing the performance of a similar set of installations. It remains a project based mechanism where emitters receive carbon credits directly. Thus, like the current CDM, it **does not require heavy government**

involvement. The additional capacity necessary for a reformed CDM is likely to be tied to the technical expertise necessary for setting up meaningful standardised baselines. It will also consist of setting up appropriate data aggregation systems for the systematic collection and monitoring of emissions data.

In order to allow a wider range of developing countries to participate more effectively, the international community may wish to **institutionalise a coordinating agency that promotes greater use of standardised approaches in the CDM.** This coordinating agency could act as the international project manager responsible for consistency, coordination and timely implementation of the steps necessary for the development of standardised baselines. **Transparent policy reforms** and statements will also be needed to incentivise project developers and private sector engagement.

New market mechanisms such as large-scale crediting and trading have been proposed as a means of scaling up carbon finance to developing countries. If introduced, these mechanisms would represent a transition from an individual project-level approach to a sector wide mechanism. If adopted, these mechanisms will **give developing countries the opportunity to make their own contribution to emissions reductions.**

Large-scale crediting rewards emissions reductions at the sector level by **crediting emitters *ex-post*** for beating the baseline level of emissions for a particular sector (the baseline would be set below the Business As Usual emissions trajectory for the sector). The crediting baseline can be interpreted as a ‘no lose’ target: if emissions are higher than the baseline, no credits are earned, but neither is there a penalty imposed for missing the target. **Large-scale trading would require setting absolute emissions targets at the sector level** but with **carbon units allocated upfront.** Responsibility for reducing emissions (and benefits for doing so) could more easily be transferred to industrial installations and other emitters.

Capacity requirements for large-scale crediting and trading increase at the government level (relative to current CDM capacity requirements) as governments will be responsible for the baseline setting process as well as the design and implementation of policies and sector compliance mechanisms. **Large-scale trading** may make it easier for governments to devolve responsibility to emitters through an Emissions Trading Scheme (ETS). This would introduce additional **capacity needs at the emitter level.**

At the government level, **large-scale crediting requires technical competence for data collection, notably for baseline setting and Measurement, Reporting and Verification (MRV).** The process of identifying the most suitable performance indicators will require developing countries to assess their own level of capacity for data collection as well as the capacity building needs for improved reliability and availability of data. If there is a lack of sufficiently detailed data, **a data collection phase should be established before the crediting baseline is determined.** This phase would give developing country governments the opportunity to train key staff in the methodologies and expertise needed to implement data collection systems. This could be done by direct technical assistance provided by developed countries and/or multilateral institutions at limited cost. **Large-scale trading, particularly if**

accompanied by a domestic ETS, will also require additional technical capacity for establishing **full sectoral inventories/registries**.

For large-scale crediting, it would be helpful to have **one entity take responsibility for coordinating activities, including the development of proposals, relevant data collection, the monitoring of emission reductions and the coordination of all measures between the government, private sector and other stakeholders**. This coordinating entity could also be the formal contact point between that country and the international carbon community.

Irrespective of whether large scale mechanisms are based on ‘no lose’ or more binding targets, developing country governments will need to choose the right domestic policy and policy frameworks when deciding **how best to incentivise private sector entities to reduce emission below the sector baseline**. In the case of a ‘no-lose’ target, policy instruments will play an important role since emitters will need sufficient incentives to make the necessary reductions before credits will be issued (ex-post).

Capacity requirements at **the emitter level** for industry and private entities very much depends on the chosen approach for national implementation. If a government chooses to implement a domestic ETS, emitters will need to develop capacity to measure and monitor their emissions and to report them to the appropriate government agency. At a minimum this will require technical and data collection systems training for key staff within private sector companies around energy auditing and the running of energy management systems.

Case Studies

In most cases, **low income developing countries are still developing the capacity to participate in the existing CDM at even a minimal level**. This is particularly true in Africa where the uptake of CDM projects has been very low (only 2.5% of total CDM projects are coming from Africa) and extremely fragmented.

The report has selected two low income countries in Sub Saharan Africa (SSA), **Ghana and Uganda**, for the in-depth capacity analysis explored in the case studies. The analysis recognises that **even countries at similar levels of development may have different obstacles and capacity needs**.

These case studies address the current capacity and capacity needed for carbon market participation within each country and recommendations for how these gaps can be filled by looking at the following four areas:

- 1) **Institutional capacity**: Are the right entities in place and empowered to act? Are the appropriate institutional frameworks in place?
- 2) **Policy level capacity**: How can cross-governmental policy measures be utilised to support carbon market participation?

- 3) **Capacity for data management (MRV and technical):** How will the country accumulate and manage the data necessary for greater carbon market participation?
- 4) **Financial Capacity:** Is there adequate opportunity and capacity in the market to attract public/private sector capital to support the development of the carbon market?

In many ways the existing capacity and capacity needed in these two countries is similar. Both countries have had low levels of carbon market participation despite having strong representation in international negotiations. **Both countries have had support from development partners who have funded various capacity building efforts.** Both countries have a shortage of the financial and technical resources necessary to fully embrace the carbon market opportunities within the country.

However, **there are also important differences** between these countries with regard to the specific obstacles that they have faced, the nuances of institutional capacity at a national level and the recommendations for actions that can be taken to facilitate greater carbon market participation in the next 3-5 years. These differences, explored in detail in each of the case studies, are **primarily around internal fragmentation on climate change initiatives at a governmental level, the roles of the DNA and private sector engagement.**

Throughout the case studies evidence gained from interviews and the authors' in-country experience is referenced. To ensure that this portrayal is accurate and reflective of the layers of local complexity and detail, the report has been 'ground tested' with the interviewees and a third party peer review panel. However, **the reader should note that these case studies provide a snapshot that is relevant in early 2010** and as the market evolves and the political arena at both a local and international level shifts, so too will the capacity analysis and the recommendations.

Additional financial, technical and human capacity is needed at all levels in both countries to ensure that they are well positioned to develop their carbon market potential. Whilst a unified national vision that systematically addresses all relevant climate issues would be helpful to safeguard sustainable development and to prepare these countries to participate in large scale mechanisms, it is not essential to have this level of cross governmental coordination for them to begin participating in project-based (including Programme of Activities) CDM.

Therefore, **initial capacity building efforts in both countries should focus on actions that can be taken to increase participation in the current CDM, particularly through the Programme of Activities (PoA),** because a high level of government intervention is not necessary for participation in these mechanisms.

A parallel capacity building stream focused on **building the institutional and private sector capacity necessary for the data management requirements of the more advanced mechanisms is also explored in these case studies.**

Although the specifics of existing capacity and capacity gaps varies between the two countries, both countries need to scale up the involvement of the private sector, increase the technical capacity for

project development and data management and increase access to carbon finance if they are to increase their carbon market participation. Recommendations for how this can be done are summarised below:

- A private sector/civil society engagement strategy that incentivises local project developers and financial institutions to develop the technical/human capacity necessary to implement projects is an important precondition to carbon market participation.
- Development partners and multilateral institutions may choose to support technical skills training programmes that demonstrate how to prepare Project Design Documents (PDDs) and how to conduct the sector or sub-sector baseline studies necessary for standardised approaches.
- NGOs and Civil Society organisations can be trained and funded to act as managing entities for PoAs.
- Community outreach programmes can be formed to educate communities about PoA opportunities.
- Host country governments and development partners may wish to work with local financial institutions to encourage them to take on carbon finance projects. Local financial institutions have expressed an interest in participating in government/development partner backed credit export guarantee programs as a mechanism for mitigating risk and encouraging participation.
- If these countries are to fully participate in an evolving carbon market then they must migrate away from individual knowledge/power bases and move towards the formation of robust systems and systemic processes around national decision making, data aggregation/MRV and private sector/civil society engagement strategies. Host country governments can assist this process by committing to transparency and coordination of efforts whenever possible.

I) INTRODUCTION

1.1 Aim of the work²

The aim of this paper is to set out the structural capacity necessary for developing countries to participate in an evolving carbon market. The main body of this paper looks at the capacity needed for developing countries to participate in existing market mechanisms (i.e. the Clean Development Mechanism (CDM)), taking account of the way it may change over time; and possible new mechanisms such as large-scale crediting and trading. This analysis will be followed by two in-depth country case studies: **Ghana and Uganda**. The case studies will provide a live illustration of the practical capacity needed for these two countries to efficiently participate in an evolving carbon market, highlighting current obstacles and what can be done to overcome them.

This paper takes a macro view of the capacity needs in developing countries, differentiating between 'low income', 'middle income' and 'advanced' developing countries³. Whilst there are exceptions, it is generally true that advanced developing countries will have greater capacity for adopting new market mechanisms than low income and middle income countries because advanced developing countries are at a more advanced stage of economic development.

Throughout the paper there are a number of recommendations promoting the establishment of institutional bodies at the developing country level which could help facilitate the aggregation of data, technical expertise and other necessary capacity for increased carbon market participation. The set up of such institutional entities will support the aggregation of different levels of capacity and be sufficiently flexible to develop over time with new market mechanisms as they evolve. The main body concludes with a summary of these institutional recommendations and a pathway analysis illustrating the capacity requirements at each carbon market mechanism level.

1.2 User Guide

This paper can be read as a whole or as four stand alone documents broken down as follows:

- 1) Executive Summary
- 2) Main Body

² See Appendix 1 for the Terms of Reference

³ The authors have chosen to subdivide developing countries according to World Bank Gross National Income (GNI) per capita data:

- Advanced developing country: countries with GNI per capita between \$3,706 and \$11,455 including Brazil, India, Mexico and South Africa. China is also included in this country group although some would create a country group for China alone given its scale, emissions level and size of CDM market (Ecofys, 2009)

- Middle income developing countries: countries with GNI per capital between \$936 and \$3705

- Low income developing countries: countries with GNI below \$935, this country group includes Least Developed Countries but is not limited to these as it also includes Sub-Saharan African countries like Ghana and Uganda

- 3) Ghana case study
- 4) Uganda case study

1.3 Definition of capacity

In its broadest sense, capacity is defined as the current and/or future ability to participate and transact in the carbon markets (local, national and international). In order to be an efficient market, a country has to have the structural, technical, human and financial capacity to ensure that carbon emissions reduction activities can be identified, pursued and the correct processes followed all the way through to sale of credits.

In reality, capacity draws as much on systems, frameworks and markets as it does on political will, incentives and the integration of carbon markets into other aspects of a country's development plan. In this report, capacity building is defined as the preparatory activities required to link countries, sectors, projects and/or businesses to carbon markets and allow them to participate through a range of trading mechanisms, including baseline crediting and emissions trading (Lazarowicz, 2009).

1.4 Assumptions

The analysis and recommendations of this paper are based on the following assumptions:

- 1) In order for the carbon markets to continue to exist in their current form, there needs to be sustained demand for credits at the international level, which is most likely to come from developed or advanced developing countries because of their greater industrial concentration and emissions
- 2) Therefore, this paper assumes that an international policy environment is in place in which governments and industries are continuously and mandatorily incentivised to 1) take on national emission reduction targets; and 2) access market mechanisms that will enable them to reduce emissions in the most cost-effective way
- 3) There will be clear messaging about how developing countries can access support from the international community to develop their MRV capacity

II) CURRENT STATE OF THE CARBON MARKET

2010 is an uncertain year for the international carbon markets. Whilst the international community had high hopes, Copenhagen did not produce the ambitious outcome many stakeholders had desired. In the absence of global legally binding frameworks, the structure and framework for the future of international carbon market remains unresolved. The lack of a post-2012 framework is an obstacle that is having a major impact on developing countries' willingness to forge ahead with national plans aimed at increasing their participation in the CDM and/or other new mechanisms. Developing countries are by

definition under-resourced and thus, the mobilisation of valuable human, technical and financial capital towards building institutional capacity for an unclear and uncertain goal is difficult to prioritise.

On a more positive note, the lack of clarity about the future of the carbon markets has shifted the climate change debate to be more inclusive of, and aligned with, overall national development plans and fulfilment of the Millennium Development Goals. Many developing countries recognise that it is now even more important for stakeholders to coordinate efforts to implement practical initiatives that pave the way for low carbon development and accelerate climate change mitigation and adaptation at the national and international level. The uncertainty of current markets also provides an opportunity for the international community to strategically think about how a post-2012 framework might incentivise developing countries to set their own enhanced emissions reduction targets.

As the case for scaling up mitigation efforts becomes more urgent, carbon market mechanisms will play a key role. Current mechanisms are unlikely to be sufficient to achieve the scale of mitigation necessary and new mechanisms will be needed to help increase finance flows to developing countries.

III) CAPACITY NEEDED FOR FUTURE PARTICIPATION IN CARBON MARKETS

This section considers the different capacity requirements for developing countries to participate in:

- **The current CDM, including Programmatic CDM**

This includes looking at the capacity needed for the CDM project cycle and the adoption of the Programme of Activities (PoAs). It does not however go into depth about institutional, policy or technical capacity because this information has been widely covered in other literature.

- **Proposed reforms to the CDM , particularly greater use of ‘standardised approaches’**

This section will include an analysis of the technical capacity requirements for data collection and management, institutional capacity and the necessary policy frameworks to participate in a reformed CDM, highlighting the additional capacity necessary for each of these levels

- **Proposed new market mechanisms: large-scale crediting and trading (including the use of Emissions Trading Schemes)**

This section will include an analysis of the technical capacity requirements for data collection and management, institutional capacity and the necessary policy frameworks for large-scale crediting and large-scale trading. In accordance with how credits are transferred under these two mechanisms, the capacity analysis is divided into government level capacity and emitter level capacity sections.

3.1 Capacity for the current CDM (including Programmatic CDM)

3.1.1 Capacity for the current CDM

In order to participate in the current CDM, developing countries must develop the institutional capacity in public and private entities to handle the entire CDM cycle from project identification, accessing project finance, writing the Project Design Documents, successful registration and implementation and monitoring.

All relevant stakeholders should develop a common understanding of the CDM and the role of the Designated National Authority (DNA). This ensures that all relevant institutions have the same basis and level of knowledge in discussions and that they understand the benefits and opportunities provided by the CDM.

In order to establish a functioning DNA, the following steps are needed:

- 1) An organisational unit in an existing or new institution or government agency needs to be designated as the DNA
- 2) The DNA must be financed
- 3) Staff with clear understanding of the CDM has to be assigned to the DNA. This will require training of key staff
- 4) Responsibilities for project evaluation and final decision-making need to be allocated
- 5) Procedures for the assessment and approval of proposed CDM projects need to be established (i.e. host country approval) including criteria for assessing the sustainability of projects
- 6) Carbon finance for project development must be accessible
- 7) Developing the data collection and management capacity at the installation and DNA level to calculate project baselines, emissions reduction potential and monitoring reductions over the life of the project. Capacity building in this area will need to target technical experts such as local consultants and project developers

In addition to this institutional set up, developing country governments will need to ensure that there is a pipeline of CDM projects and mitigation opportunities available and that the incentives to develop them are created through effective policies and regulation. Ideally governments should also encourage the establishment of a CDM service sector (i.e. local Designated Operational Entities (DOEs) that service the region/sectors of relevance, project developers, consultants).

Many developing countries do not yet have these criteria in place, particularly for many low income developing countries, the lack of CDM investment guidance, finance facilities and local project developers creates substantial obstacles to carbon market participation.

3.1.2 Capacity for the Programmatic CDM

Programmatic CDM, also known as the 'Programme of Activities' (PoA), involves the aggregation of several smaller emission reduction activities and their submission as a single CDM activity, employing

one set of methodologies for baseline determination and the monitoring of project performance⁴. This approach, introduced in 2007, is expected to provide an entry point for project types that have until now been unable to make it into the current CDM pipeline due to their small size and comparatively high transaction cost. Project activities can be implemented in several locations (including, potentially, across national boundaries) and at different times. In addition, PoAs allow for bundling of several projects together under one baseline which allows for lower costs and only one submission to the Executive Board.

Capacity for participation in PoAs remains the same as that needed for the traditional CDM given project cycles are similar in both approaches. However PoAs are likely to need additional capacity for:

- Selecting and defining the Managing Entity (ME) of a programme. MEs, which can be either a public or a private entity, will be responsible for proposing and overseeing the PoA including development and implementation of monitoring plans.
- The Managing Entity will need to be trained in the appropriate skills and knowledge to select project activities, set and monitor the baseline of projects that may be geographically dispersed and keep abreast of guidance from the Executive Board e.g. on how to assess additionality, double counting and boundaries.

Thus the additional capacity required for the Programmatic CDM lie in the institutionalisation of the Managing Entity whose duties and responsibilities go beyond the typical ones of project developers in the traditional CDM. Technical capacity for data collection and monitoring at the emitter level will also be needed given the specificities around MRV requirements for PoAs.

3.2 Capacity for reformed ‘standardised baseline’ CDM⁵

A ‘standardised baseline’ approach is being proposed as a reform to the current CDM, not only as a way of addressing the potential shortcomings of the current mechanism⁶, but also as a means for developing countries to increase their participation in the carbon market.

Reformed CDM remains a project-based mechanism, where individual emitters receive carbon credits directly and thus, like the current CDM, **does not require heavy government involvement** in order for developing countries to participate.

Under a standardised approach, projects would be compared against a pre-determined standard which is derived from assessing the performance of a set of similar installations. A project would gain credits if

⁴ Each PoA must apply one approved baseline and monitoring methodology, involving one type of technology or measure applicable to all activities within the programme – see www.cdmrulebook.org

⁵ See Appendix 2 for illustration and comparison of credit generation for current and standardised baseline CDM

⁶ Such shortcomings include: the concern that additionality provisions are either too tight, or not tight enough; the burdensome institutional and operational structure, the project portfolio being too skewed towards “end of pipe solutions”, and the regional and sector distribution of projects does not adequately reflect the range of emission reduction opportunities in the market (Hampton et.al 2008)

it is able to beat the performance standard. For instance, a standard baseline might be agreed for the steel manufacturing sector within a country. The performance standard could be expressed in terms of X tonnes of CO₂e per tonne of steel produced by an emitter. The level of the performance standard might be set at, for example, the emissions per tonne of the most efficient 20% of firms in the sector, in that country. Provided a project achieves or beats that performance standard, it is deemed additional and can earn credits for emissions reductions relative to the baseline.

With a standardised approach, as with the current CDM, it is the individual installations that receive carbon credits directly, so most capacity requirements are borne by the private sector.

In many ways, the strength of a reformed CDM is its reliance on existing mechanisms and institutions which in some developing countries have already been developed under the CDM (Hampton et al., 2008). Developing countries with operational DNAs and ongoing experience approving current CDM projects will be further along the learning curve than those countries that have yet to register a project. In addition, greater use of standardised approaches may offer the opportunity for those developing countries with little or no participation in the current CDM to become more involved. This is because standardised approaches could help reduce uncertainty, complexity and cost for project developers and therefore make smaller-scale projects in perceived riskier regions, more attractive. The approach could also allow for more ‘top down’ development of baselines e.g. by the CDM Executive Board, international institutions, industrial bodies or national DNAs. This could further simplify the process for project developers and benefit poorer developing countries, particularly if the development of methodologies is prioritised for currently underrepresented activities and regions.

3.2.1 Technical capacity for data collection and management

The capacity needed for developing countries to take advantage of a move towards greater use of standardised baselines in the CDM is tied to **the key requirement of setting up meaningful performance standards** (i.e. the criterion by which the attainment of the baseline can be judged). The choice of performance indicator (i.e. tonnes CO₂e/tonne of steel) and the level at which the performance standard is set is critical, as this will influence the level of take-up and the degree to which the credits that are issued reflect real emission reductions⁷. In order to be meaningful, the performance standard needs to be set across an appropriate set of peers (i.e. selecting the appropriate economic outputs to be compared). The level of stringency also needs to be carefully defined in order to achieve the balance between setting achievable performance standards to encourage participation on the one hand and setting ambitious enough baselines to reduce emissions on the other. Performance standards will need to be updated over time as performances and standards within each sector improve with technical progress.

Given this, the establishment of data collection systems is essential for obtaining and monitoring appropriate and reliable data and the determination of baseline stringency levels. Developing countries

⁷ For more details on setting performance standards see Appendix 3

will need the technical expertise of a number of agents, both within the private sector (e.g. consultants, technical engineers) and public sector (e.g. ministries of environmental relevance such as Science & Technology, Environment and Meteorology for instance) to set up these systems. Additional stakeholders such as non profit organisations, academic institutions or other development partners may also be involved to research and set up the necessary structures needed for data collection systems. The training of in-country staff will be essential in order to ensure the tracking of progress and regular updating of performance standards.

In the first instance, standardised approaches are likely to be most suitable for projects in sectors where there is a similar mix of technologies and practices and where sufficient data is available (or easily obtainable) on technologies and their emissions levels. Capacity requirements will be borne by the different actors who choose to be involved in setting the baseline. The following are examples of entities which could potentially develop standardised approaches:

- **Private sector (project developers or industry associations)** as is currently the case under the CDM. To encourage private sector development of standardised baselines, developing countries should encourage business associations in relevant sectors to play a role in helping industry to collect, aggregate and monitor data. Such entities could be supported by development partners who may wish to consider funding private sector initiatives.
- **Designated National Authorities (DNAs) or host country institution.** DNAs could develop their own baselines, focusing on project types with the greatest scope for emissions reductions in their countries. They will need to work with the relevant industry bodies in order to access the data required to develop the baseline and build monitoring capacity required to update the baseline when required.
- **Independent body e.g.** an expert panel operating under the CDM Executive Board or multilateral institution could develop baselines in partnership with national DNAs.

Regardless of who develops standardised baselines, an independent international body (e.g. the CDM Executive Board) would need to play a role in verifying the data and retain the decision over whether or not to approve a standardised methodology. Capacity building efforts for MRV should include the training of technical staff in-country, to enable the tracking of progress and evolution of performance standards.

Box 1 – Current capacity for data collection – obstacle to setting standardised baselines

In reality, the challenge of collecting data is a significant capacity issue facing most developing countries. In many countries, there is very little experience tracking the key technical or performance variables necessary for establishing and monitoring GHG emission levels, intensity or energy use (Egenhofer et al., 2009a).

There is a significant gap in data availability between modern and large-scale plants and small to medium sized ones in key sectors of many developing countries. Low income developing countries have a majority of small and old plants therefore have very little data available. More advanced countries

have larger and new facilities often operated and regulated by multinational companies that have mandatory data collection requirements. In these cases, external compliance means that capacity for data collection and the national level is more developed.

Because data is often not publicly accessible in developing countries, transparency of data collection processes is also a challenge. The Chinese government, for instance, legally own all data that is reported back to it but publishes only a limited quantity of aggregated data in the statistical yearbook, which is the only source available to the public. These types of constraints create obstacles at a national level that will need to be resolved before standardised approaches can be used more widely.

3.2.2 Institutional and policy requirements

Except in the case where a government agency is the developer of a particular project activity or standardised methodology, the official role of the government under both the current and future CDM is limited to evaluating and approving potential CDM project activities through the DNA.

However, with greater use of standardised approaches, it would be helpful if developing country governments had a conducive institutional and policy framework to support knowledge and dissemination of latest methodologies and approaches. This framework would also be helpful in engaging the private sector and helping private sector entities (e.g. industry bodies) collaborate in data collection and developing baselines.

Developing countries would also benefit from making clear policy statements from the outset defining their policy direction with regards to CDM reforms and supportive policy instruments. Transparency is essential in order to correctly incentivise the private sector and non-governmental parties involved. In order for accurate installation-level emissions data to be collected, the expected benefits of these data collection methods must be clearly communicated to the private sector.

Recommendation: It may be useful for developing countries to **institutionalise a single coordinating agency that promotes CDM activity**. This coordinating agency could act as the international project manager responsible for consistency, coordination and timely implementation of the steps necessary for the development of standardised baselines (Hayashi et al., 2009). The CBC could work closely with the DNA, and would interact with project developers, industrial associations, energy experts and CDM regulators from an early stage to ensure that all parties are equally involved in the process.

3.3 Capacity for New Market Mechanisms: large-scale crediting and trading⁸

⁸ The reader must bear in mind that large-scale crediting and large-scale trading are mechanisms that have been proposed for inclusion within a global deal, but which do not currently exist. In addition, because of their advanced nature they are most likely to be adopted in middle and advanced developing countries first

Large-scale crediting⁹:

Large-scale crediting has been proposed as a means of enabling countries to transition from existing project-level participation in carbon markets (i.e. through the CDM) to a sector wide approach that, if adopted, will give developing countries the opportunity to make a net contribution to reducing GHG emissions (Lazarowicz, 2009). Under this system, **a ‘baseline’ or target level of emissions for a particular sector (e.g. electricity, steel, cement, transport, or pulp and paper) in a developing country would be set below the ‘business as usual’ (BAU) emissions trajectory for the sector.** The difference between BAU emissions and the baseline represents ‘own action’ on the part of the developing country to reduce its emissions. Developing countries would pledge to achieve the baseline level of emissions (which could be expressed as absolute targets or potentially intensity-based targets such as CO₂/ton of cement or CO₂/kWh) and emission reduction units would be issued for emission reductions below the baseline (*ex-post*). No penalty would apply in cases where countries fail to meet their target level (therefore called ‘no-lose’ target).

Developing country governments could choose to reach, and go beyond, their crediting baseline using a domestic Emissions Trading System (ETS)¹⁰ and/or other policy tools such as taxation, regulation and/or subsidies. Exactly how a country would achieve its emission reductions would be a sovereign decision.

In contrast to the CDM which will remain a project-based mechanism where entities decide whether or not to participate, **large-scale crediting covers emissions from all entities or activities in the sector boundary.** Importantly, **it is likely that the CDM will continue to be overseen by the current CDM Executive Board, whereas sectoral ‘no-lose targets’ would be negotiated under the COP or another body that is yet to be determined** (Schneider et al., 2009).

Large-scale trading¹¹:

Large-scale trading requires setting an absolute emissions target for a particular sector, meaning a given sector in a given country would have an agreed emissions level for a specific time period. Emissions allowances would be allocated to the government, up to the level of the target. Countries would then need to limit sector emissions to the level of this cap during the course of the defined period. As with large-scale crediting, developing country governments could choose to implement their sectoral targets using an ETS and/or other policy tools such as taxation, regulation and/or subsidies. Exactly how a country would implement a sectoral target to achieve its emission reductions would be a sovereign decision.

⁹ See Appendix 4 for illustration of large-scale crediting

¹⁰ ETSs are cost-effective implementation tools because they allow domestic trading and the involvement of businesses and other emitters. Emitters that might otherwise find meeting their targets too expensive can purchase surplus allowances from other emitters. An ETS opens up international trading opportunities if linked to other ETSs, which can maximise the financial benefits available to the developing country from trading surplus allowances. Given the low-cost abatement opportunities in developing countries, there is good potential for trading surplus allowances.

¹¹ See Appendix 5 for illustration of the transition from large-scale crediting to trading

However, a **key feature of large-scale trading is that the carbon units/allowances are allocated at the beginning of the period.**

Importantly, **the *ex-ante* allocation of credits facilitates the transfer of abatement effort to emitters within the country, most likely through an ETS.** When developing countries choose to create an ETS for certain sectors they devolve a proportion of their allowances to emitters, giving responsibility to those who control emissions. The allowances allocated to entities can be managed as an asset, with a clear market value, and mitigation investment could be directly rewarded by selling credits on the carbon market, without having to wait for a sector-wide assessment of emissions performance, as would be the case with large-scale crediting.

3.3.1 Government level capacity requirements

Capacity for reliable data collection and management:

As with the standardised baseline CDM model, a large-scale crediting model requires technical competence for data collection, notably for baseline setting and MRV (Egenhofer et al., 2009). Capacity building efforts will be similar to those required for setting standardised baselines in terms of developing accurate and reliable data collection processes. **In contrast to the CDM however, where baselines can be set, and data collected by a variety of different entities, large-scale crediting will require developing countries to hold this capacity at the governmental level as the government will become responsible for setting sector-wide baselines.** Capacity to collect and compile data of adequate quality to support the assessment of technical opportunities and to negotiate sector wide baselines will be key to the success of large-scale crediting mechanisms.

In determining baselines for large-scale crediting, developing country governments will be required to develop processes for accessing historical data and sector-specific information as well as document assumptions and models that can be used to arrive at the proposed baseline.

Recommendation: If there is a lack of sufficiently detailed data, **a data collection phase could be established before the crediting baseline is determined.** This phase would give developing country governments the capacity to train key staff in the methodologies and expertise needed to implement data collection systems. Models such as ‘MAPS’¹², which sets out examples of developing country Mitigation Action Plans and Scenarios with suggested country pilots, could prove helpful in sharing best practice for countries at the data collection phase. Indeed, by using the scenario approach, MAPS can help developing countries identify tangible options for data collection and the use of methodologies.

The process of identifying the appropriate crediting baselines will require developing countries to assess their own level of capacity for data collection as well as their capacity building needs for improving reliability and availability of data. The role of the international community will be paramount in assisting developing countries in these ‘self assessments’.

¹² See Appendix 6 for more information about MAPS

Large-scale crediting also requires government level capacity for the development of robust systems for MRV, including full sectoral inventories, in order to ensure that sector boundaries are respected and that emissions' reporting is consistent over time. **Legal frameworks on how to collect store and verify data will need to be in place and responsibilities for enforcement of laws clearly defined.** Establishing robust MRV protocols will require knowledge and technology transfers at national and sectoral levels.

In some cases, developing countries may already have reliable emissions reporting programmes in place (such as the Cement Sustainability Initiative, see Box 2), thus MRV protocols would need to focus on verifying the accuracy of these programmes, particularly if these countries are looking to the international community for financial support. If credits are tradable internationally, inventories will need to be consistent, with equivalent units and measurement techniques. Robust systems for aggregation, collection and understanding of the technical and scientific aspects of these processes are necessary for governments to set absolute targets. In addition, developing countries will need to ensure that targets are coherent with the sector operations and installations they are representing.

Box 2 – Current capacity for establishing measurement protocols

Current capacity in some developing countries and regions demonstrates potential for elaborated measurement protocols which could be useful for determining sector-wide baselines. Some existing measurement protocols for data reporting, verification and analysis have already been developed and built for some sectors, notably in the cement, aluminium and steel sectors:

The **Cement Sustainability Initiative (CSI)** is developing a database for energy use and CO₂ emissions data. This database will help establish an effective framework for policy makers in developing countries to understand how a sectoral approach could function within the cement industry. At an international level it will also assist them with estimating the level of emission reductions that could be achieved under a large-scale crediting regime. **This private sector funded initiative demonstrates how emitters can be instrumental in building the necessary capacity for large scale mechanisms when duly incentivised.** Companies under the CSI have agreed on a 'Cement CO₂ Protocol' (WBCSD, 2005) as a harmonised methodology for calculating and reporting their emissions. The protocol contains a spreadsheet template which can be used by cement companies to help prepare their CO₂ inventories.

Through its examination of a sectoral approach for the steel industry, **the World Steel Association** is working on **improved benchmarking for performance data.** It is also working on the **facilitation of data reporting and baseline setting on a national basis.** This system-based approach is being supported by a number of developing countries, most notably China (Newman, 2010), and offers a very helpful example around which developing countries can model their sector benchmarking processes.

Ecofys together with the UK government and the World Bank have created sector proposal templates for the development of national crediting baselines in the power generation, cement and transport sectors¹³. Developing countries could use these templates as a capacity building tool for addressing

¹³ <http://www.sectoral.org/>

crucial data measurement and management issues. The creation of such tools can help form part of the international guidance necessary for developing countries to map out their own 'pathway' to increased participation in scaled up market mechanisms.

Recommendation: Given the sensitive nature of much of the data, it is suggested that developing countries and the international community establish **a central, independent body tasked with the collection and storage of data at a national and international level** (Hampton et al., 2008). Such a body would not only provide the neutral ground needed for data to be aggregated and compared, it could also serve as a coordinator whose prime responsibility would be to ensure that data is comparable, in similar formats and avoids double counting (Egenhofer et al., 2009a).

As with large-scale crediting, **large-scale trading** will require government level capacity for the development of robust, consistent systems for MRV. Additional capacity (e.g. setting up registries) may be required if the government opted to implement their target through the use of an ETS.

Institutional capacity:

Developing country governments that participate in large-scale crediting will be responsible for proposing, implementing and monitoring their own MRV protocols within the system. For this purpose, different institutions and stakeholders need to be involved.

Recommendation: Because of the complexity of the tasks involved, developing countries would benefit from designating and setting up **one entity to take responsibility for coordinating all activities, including the development of proposals for large-scale crediting, relevant data collection, the monitoring of emission reductions and the coordination of all measures between the government, private sector and other stakeholders**. This 'coordinating' agency could also be the formal contact point at the international level. Such an institution would need to have pan-governmental authority and sit fairly high up in national politics in order to be credible and effective at both a national and international level.

Ideally the coordinating agency would have a supervisory committee which would include representatives from all stakeholders such as ministries, government agencies, private sector and civil society (Hayashi et al., 2009). In order to be effective, the committee would have broad and specific knowledge of sectors, technology and policy at both the national and international level. Developing countries may need to seek experts from the international community to train local professionals for these roles to ensure systematic knowledge transfer.

At a government level, we would expect large-scale trading to require similar institutional capacity as crediting. However, for countries devolving credits through an ETS, extra institutional capacity will also be needed for the set up of a registry that is embedded in the legal framework and for the effective regulation and implementation of the trading scheme. The set up of a functional registry requires institutional capacity for preparing and implementing all the regulations linked to trading, as

well as historical and baseline data for all GHG emitting activities. It also requires the set up of a national entity which is licensed to trade and the creation of supervisory body for the ETS.

Capacity for a robust policy framework:

Irrespective of whether large scale mechanisms are based on ‘no lose’, or more binding, targets, developing country governments will need to choose the right domestic policy and policy frameworks when deciding **how best to incentivise entities to reduce emission below the sector baseline**. Extra capacity and knowledge will be needed to develop the policies and legal frameworks necessary to determine how these incentives would be structured. This will include determining which kinds of policy tools will be more effective for enforcing regulation and laying out clear incentives. **Policy instruments will play a key role in all mechanisms but particularly for large-scale crediting**, since emitters will need sufficient incentives to make the necessary reductions before credits will be issued (ex-post).

Examples of relevant policy measures include:

- Emissions Trading Systems
- Regulation, such as banning a certain type of old or high emitting technology;
- Feed-in tariffs to encourage investment in renewable energy;
- Subsidies for low carbon technologies, potentially re-financed through credits from the mechanism (Schneider et al., 2009).

For participation in large-scale mechanisms, it will be important for developing countries to have one vision (their Low Carbon Growth Plan) that unifies carbon market policies across government. This plan would contain national GHG inventories, emissions projections and details of the policies and measures that have been put in place to reduce emissions.

3.3.2 Emitter level capacity requirements

Capacity requirements at the emitter level for industry and private entities very much depends on the chosen approach for national implementation¹⁴. With large-scale trading, at the emitter level, an **Emissions Trading Scheme** could be one of the tools used to meet absolute targets, rewarding low emitting businesses and technologies through domestic carbon trading.

With an ETS, some functions are devolved to the emitters themselves. Whatever the target, emitters will need to develop capacity to measure and monitor their emissions and to report them to the appropriate government agency. At a minimum this will require technical and data collection systems training for key staff within private sector companies around energy auditing and the running of energy management systems. Emissions reporting could be done through the use of dedicated IT tools for instance, to ensure they were reported in a consistent format. However, IT tools and systems will need

¹⁴ see Ecofys, 2009

to take account of the fact that access to computers, the internet and reliable electricity can be limited in many developing countries. For instance, *CarbonFlow* is a proposed IT tool for managing CDM projects within DNAs and has been designed specifically with countries that have limited internet access in mind¹⁵.

Current initiatives for measuring and monitoring emissions at the emitter level are present at both the international and national level and could be used as models for emitter level capacity building. **The Greenhouse Gas Protocol Initiative has developed the standards, guidance and tools for accounting and reporting company level GHG emissions inventories and has designed them to be consistent with those national level inventories required by the IPCC** (Newman, 2010). These guidelines have been developed to be user friendly for non technical staff and designed to increase the accuracy of emissions data at company level.

Some countries already have programmes to help emitters monitor their emissions. The Chinese National Development and Reform Commission promotes systems for energy auditing and management among key energy intensive sectors like cement and steel and has implemented a programme for the top 1000 energy consuming energy enterprises (Ecofys, 2009).

IV) CONCLUSIONS AND RECOMMENDATIONS

4.1 Pathway Analysis

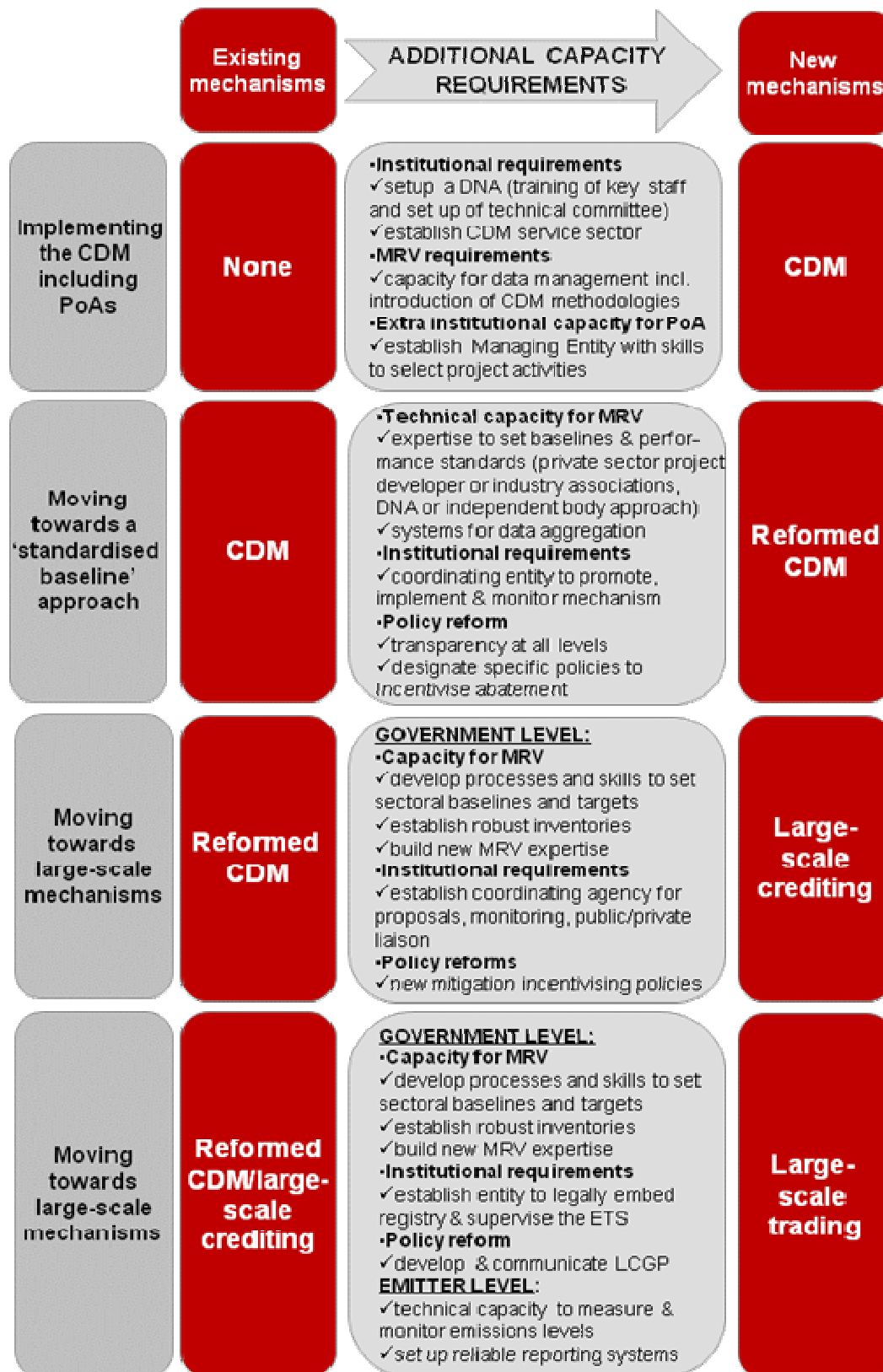
This paper has demonstrated that developing countries' participation in evolving carbon market mechanisms requires data management and institutional capacity as well as appropriate policy frameworks, policies and political will at both the emitter and government level. Building up the required levels of capacity will take considerable time and resources and **not all developing countries will be willing or able to implement similar mechanisms at the same time**. It is therefore likely that there will be a transition period whereby some developing countries move from implementing CDM projects to undertaking emissions reductions measures at a larger scale. Large-scale crediting and trading mechanisms would, for instance, not be appropriate for all parties and all sectors and it is likely that project-based CDM will remain the most viable option for Least Developed Countries (where capacity is currently most limited) for some time. **It is also likely that large scale mechanisms would operate alongside the CDM within a country (in different sectors)**. For instance, a country could take on large-scale commitments for a particular sector and continue to participate in the project-based CDM in other sectors as long as these mechanisms were adequately monitored to avoid double counting.

Developing countries may wish to consider which pathway will be the most efficient to increase their participation in the evolving carbon market mechanisms. Figure 1 below illustrates some of the possible paths developing countries could choose when looking to scale up capacity in order to take part in the

¹⁵ <http://www.carbonflow.com/>

market. The figure summarises the main capacity requirements analysed throughout this paper for countries to participate in different carbon market mechanisms: the existing CDM, a 'reformed' CDM with greater use of standardised approaches; large-scale crediting; and large-scale trading. **It is probable that the capacity needed to transition from one mechanism to another is similar in some cases, thus making transitioning easier.** For instance, PoAs and the reformed CDM use similar data management and baseline approaches. **It is not necessary for countries to move through each stage in a transition to large-scale mechanisms.** For instance, it would be perfectly possible for a country to move from the CDM to large-scale trading provided the capacity existed or could be easily acquired. The following pathway analysis provides a visual roadmap illustrating how developing countries can develop and adapt capacity requirements over time to a flexible, evolving carbon market.

Figure 1: Capacity requirements for evolving carbon market mechanisms (adapted from Lazarowicz, 2009)



4.2 Recommendations

As stated throughout this paper, developing countries require capacity at the data management, institutional and policy levels in order to participate in the CDM (currently and as it is likely to evolve over time) and new large-scale mechanisms. Each section of this paper analyses the specific additional capacity requirements needed at each of these levels and which actors need to be involved. Throughout the paper there are a number of recommendations promoting the establishment of institutional bodies at the developing country level which could help facilitate the aggregation of data, technical expertise and other necessary capacity for increased carbon market participation. The setting up of such institutional entities will support the aggregation of different levels of capacity and be sufficiently flexible to develop over time with new market mechanisms as they evolve.

- Capacity for reformed CDM: It may be useful for the international community to **establish a coordinating entity (e.g. operating under the CDM Executive Board) that promotes greater use of standardised approaches in the CDM.** One single independent entity could act as the international project manager responsible for consistency, coordination and timely implementation of the steps necessary for the development of standardised baselines. The agency would need to work closely with national DNAs, and interact with project developers, industrial associations and energy experts from an early stage to ensure that all parties are enabled access to the process.
- Capacity for large-scale crediting: Because of the complexity of the tasks involved, developing countries would benefit from designating and setting up **a single agency at a national level to take responsibility for coordinating all activities, including the development of proposals for large-scale crediting, the relevant data collection, the monitoring of emission reductions and the coordination of all measures between the government, private sector and other stakeholders.** It could also be the formal contact point at the international level. This national agency could be part of, or separate from, the DNA but either way would need to be effectively resourced and contain sufficient technical expertise. Such an institution would need to have pan-governmental authority and sit fairly high up in national politics in order to be credible and effective at both a national and international level.
- Capacity for large-scale crediting: If there is a lack of sufficiently detailed data necessary for sector baseline setting, **a data collection phase could be established before the baseline is determined.** This phase would give developing country governments the capacity to train key staff in the methodologies and expertise needed to implement data collection systems. Models such as 'MAPS', which sets out examples of developing country Mitigation Action Plans and Scenarios with suggested country pilots could prove helpful in sharing best practice for countries at the data collection phase. Indeed, by using the scenario approach, MAPS can help developing countries identify tangible options for data collection and the use of methodologies

- Capacity for data collection with crediting and trading: Given the sensitive nature of much of the data, it is suggested that developing countries and the international community establish **a central, independent body tasked with the collection and storage of data at a national and international level**. Such a body would not only provide the neutral ground needed for data to be aggregated and compared, it could also serve as a coordinator whose prime responsibility would be to ensure that data is comparable, in similar formats and avoids double counting.