



Establishing a **Global Carbon Market**

A discussion on linking various approaches to create a global market

Focus Area

**Energy & Climate**

Policy Directions to 2050



World Business Council for  
Sustainable Development

In its 2007 publication *Policy Directions to 2050*, the WBCSD proposes an outline for a post-2012 international framework. It features four key elements:

- The establishment of a quantifiable long-term (50-year) trajectory for the management of global greenhouse gas (GHG) emissions.
- Global cooperation to accelerate energy technology development and deployment and enable the rapid transfer of technology between nations.
- Mitigation action built progressively from local, national, sector or regional programs, each contributing to the long-term goal. This recognizes that energy and climate policy must, in the first instance, be set at national level.
- A global carbon market, allowing international trading between nations, sectors and projects, thereby introducing flexibility into the attainment of national and sector objectives.

This supplement to *Policy Directions* presents a discussion on the creation of the global carbon market. Future supplements will elaborate on other aspects of the framework.

Action to address climate change is already happening, and the pace at which initiatives are developing is increasing. Many initiatives are in response to national emissions objectives. Some are driven voluntarily by business.

A number of different emissions management approaches are being proposed, including economy-wide “cap-and-trade” systems, low-carbon fuel standards, national renewable energy obligations, energy efficiency targets, carbon taxes and technology standards. Each approach creates a (different) cost of carbon within its targeted sector or country, either explicitly through an allowance price or implicitly through the incremental cost of policy requirements.

A key objective in creating a global carbon market is to link different emissions management approaches together, thus establishing a single carbon cost and creating equitable access to the prevailing lowest cost abatement opportunities.

However, such a global market is not a substitute for policies and instruments that are designed to promote strategic investments in technology development and to provide support for large-scale infrastructure investments.

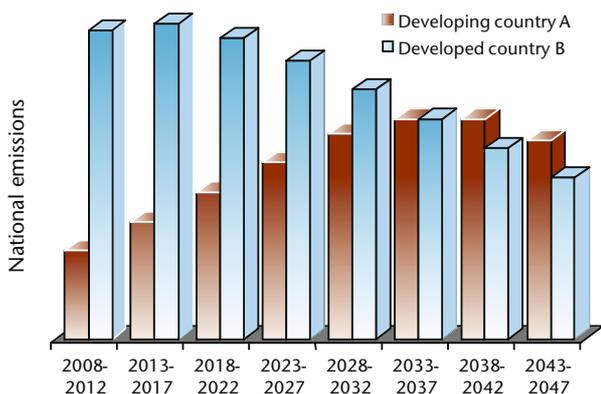


Figure 1: A global emissions target sees emissions reductions over time in both developed and developing countries of similar populations.

## ↑ The role of caps

The overall objective of climate mitigation policy is to manage global greenhouse gas emissions on an absolute basis, that is, tonnes of CO<sub>2</sub> (equivalent).

Within a global emissions target it must be recognized that some nations are still developing and their emissions will grow (with the potential to decline in the future) while other nations have the opportunity to see their emissions plateau and begin declining immediately (see Figure 1 for two countries of similar population). Nevertheless, every nation able to implement significant mitigation measures needs to structure its CO<sub>2</sub> emissions management program on an absolute basis for specific future periods, at least at the sector level where the mitigation opportunities lie.

Of course some nations are not yet in a position to begin absolute emissions management at all, but actions such as emissions reduction projects could be implemented.

Absolute emissions management is key to linking disparate national programs. However, individual programs need not be based on absolute emissions provided the national government is prepared to balance the national accounts. As such, there are two ways to cascade a national carbon budget into the economy:

### ⇒⇒⇒ One-for-one cascade

In this case there is a direct relationship between the allowance allocation at industry level within the economy and the national emissions target. The government has directly cascaded (part of) its target down into the economy, such as in the European Union’s Emissions Trading Scheme (EU-ETS).

### ⇒⇒⇒ Indirect cascade

This means that the government has established a mechanism to manage emissions within the economy that is not directly linked to the national target. For example, it may opt for a carbon tax or establish a “renewables obligation” in the power generation sector, which even when met does not guarantee a certain emissions outcome for the sector as a whole. However, such an approach does not negate the possibility of linking with other national programs.

## 🔗 Linking markets – basic approaches

Linkage occurs when one system recognizes the market instrument (e.g., allowance) operating within another system and allows its use to meet the compliance objective of the first system. For example, the EU-ETS recognizes the Clean Development Mechanism (CDM) and allows the use of Certified Emission Reduction units (CERs, the market instrument of the CDM) to meet the compliance requirement of a facility in the EU-ETS.

### ⇒⇒⇒ Unilateral recognition

A unilateral approach exists when one government recognizes the instrument of another and accepts it as legal tender, with the other government either oblivious to it or choosing to ignore such recognition.

Recognition occurs frequently in monetary markets, with the US dollar widely recognized and accepted, even though it may not be the official currency of a particular nation.



In emissions markets, government recognition, even if unilateral, should be encouraged for the CDM, such that at the very least the CER remains the de-facto international unit of carbon trading. Establishing different project mechanisms to support various national systems is not only expensive from a transaction perspective, but could undermine the rigor needed to ensure project validity and environmental integrity. It could also undermine the concept of a global carbon market.

### **Bilateral**

A bilateral approach involves specific recognition between two parties. While a global market could be constructed through such an approach, the transaction costs will inevitably rise for participants. For example, if A recognizes B, and B also recognizes C, then in practice allowances from C will be transferable to A. But if A does not formally recognize C, then additional pass-through trades would need to be constructed, all at additional cost.

### **Multilateral**

A multilateral approach could develop either by agreeing to a standard set of rules that govern all applications of emissions management, or by the development of a global registry and common emissions management instrument that allows international trade to take place. While both require significant levels of agreement, the latter is likely to be more flexible in that individual approaches would only have to recognize the international registry and its rules.

### **Projects**

As is the case with the CDM, projects form an essential part of the market. They encourage market participation across a broad spectrum, ranging from the poorest developing countries where economy-wide emissions management simply is not feasible or appropriate at this time, to the richest developed economies where conventional policy instruments may be impractical – e.g., “cap-and-trade” in the agricultural sector.

As discussed in *Policy Directions to 2050*, the project mechanism should be broadened to include sector-wide programs and augmented with additional instruments to encompass activities such as large hydro, nuclear, carbon capture and storage (CCS), land-use change and avoided deforestation.

Project mechanism reduction units also offer a convenient international instrument for de facto linking of a wide range of mitigation approaches.

### **How could it work?**

A global agreement that leads to the “ideal” situation of a global cap with all nations participating in a single carbon market is an unlikely outcome of current international processes.

Rather, a stepwise approach to this goal may be the more prudent avenue to follow, through an arrangement that allows linkage between various national approaches, covering both direct emissions management and the need to offset emissions.

In such a model, signatories to an agreed global emissions trajectory develop national emissions management programs. A signatory may then choose multilateral participation in the

global carbon market by accepting, at the national or sector level, a fixed carbon emissions budget for a given future period. The budget arises from the goals of the specific policy program(s) as a contribution to the global trajectory.

Alternatively, a signatory may choose to begin the task of managing emissions without participating multilaterally, but instead engage in international trade through unilateral recognition of project mechanisms.

In cases where national or sector programs are not forthcoming, the project mechanism(s) should be used as a minimum contribution.

Participation in this model is not mandatory, but once in, participants must fulfill their commitments and meet their agreed emission budgets.

Participation would always be dependent on a review of the carbon budget submission by an oversight body, as might be established by the UNFCCC.

### **The role of the oversight body**

A specific body is charged with overseeing the development and operation of the necessary infrastructure to allow the market to function:

1. Establishing the framework within which projects and national programs can link.
2. Creating the global carbon-trading instruments that will underpin the linkage process and issuing those instruments in response to submitted projects and programs. Today's instruments consist of elements such as Assigned Amount Units (AAU) and CERs.
3. Developing any measurement, reporting and verification rules associated with the issuance of instruments and the later step of annual reconciliation.
4. Developing and issuing guidelines for the basic structure of national programs. National programs designed along similar lines will facilitate linkage.
5. Developing and operating the necessary international registries for linking (e.g., an expansion of the current International Transaction Log - ITL).
6. Governing the overall framework, including overall trade monitoring and reconciliation at the end of each trading period.
7. Assessing submissions for inclusion in the international framework.
8. Expanding and operating the project mechanism(s). The project mechanism(s) must be revised to cover a programmatic approach and new mechanisms introduced to widen the range of accepted mitigation approaches.

## **Going forward**

A multilateral linking approach, combined with absolute national emissions targets and a robust project mechanism(s) is key to a global carbon market. Unilateral recognition of project mechanisms will also play an important role, while bilateral arrangements may be a less effective pathway to a global market.



## Key requirements for linking

Certain specific requirements must be met before different market-based approaches can be linked. Some are structural, in that without them the approaches are simply incompatible or create an allowance flow in one direction only. Others are required to give confidence that the approaches are broadly aligned in their goals.

### A clear definition

The sector to which an emissions mitigation program pertains must be clearly defined, with an accepted measurement and reporting protocol in place that defines the current status or base situation. Ideally the sector should have a clear, documented and accessible emissions history. As the sector grows and changes, the definition must be robust enough to incorporate such change, otherwise leakage will occur as emissions migrate to other, potentially non-covered, sectors.

The carbon trading instruments used must have a uniform definition to ensure they will be fungible across jurisdictions and trading schemes.

### A pathway forward

The sector must have a defined pathway forward, which can be translated into an absolute emissions change. In a rapidly developing economy emissions may rise in a specific sector, but overall emissions per unit of output should still fall.

### Assessing an effective contribution

Most importantly, the emissions change for the sector must represent a real contribution to the international goal. Two key aspects within such an assessment include the rate of improvement in energy efficiency and the rate of decarbonization.

For a developed economy, the improvements required should also result in an overall reduction in emissions. Within a developing economy, emissions may still rise even with significant improvements in these factors.

The four economies shown in Figure 2 are converging in terms of energy efficiency and carbon emissions per unit of energy, but Chinese emissions continue to rise, at least in the medium term. Longer term they may plateau and then decline (*Pathways to 2050*).

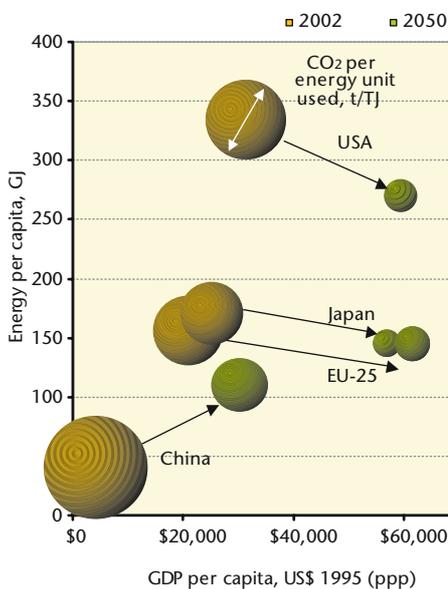


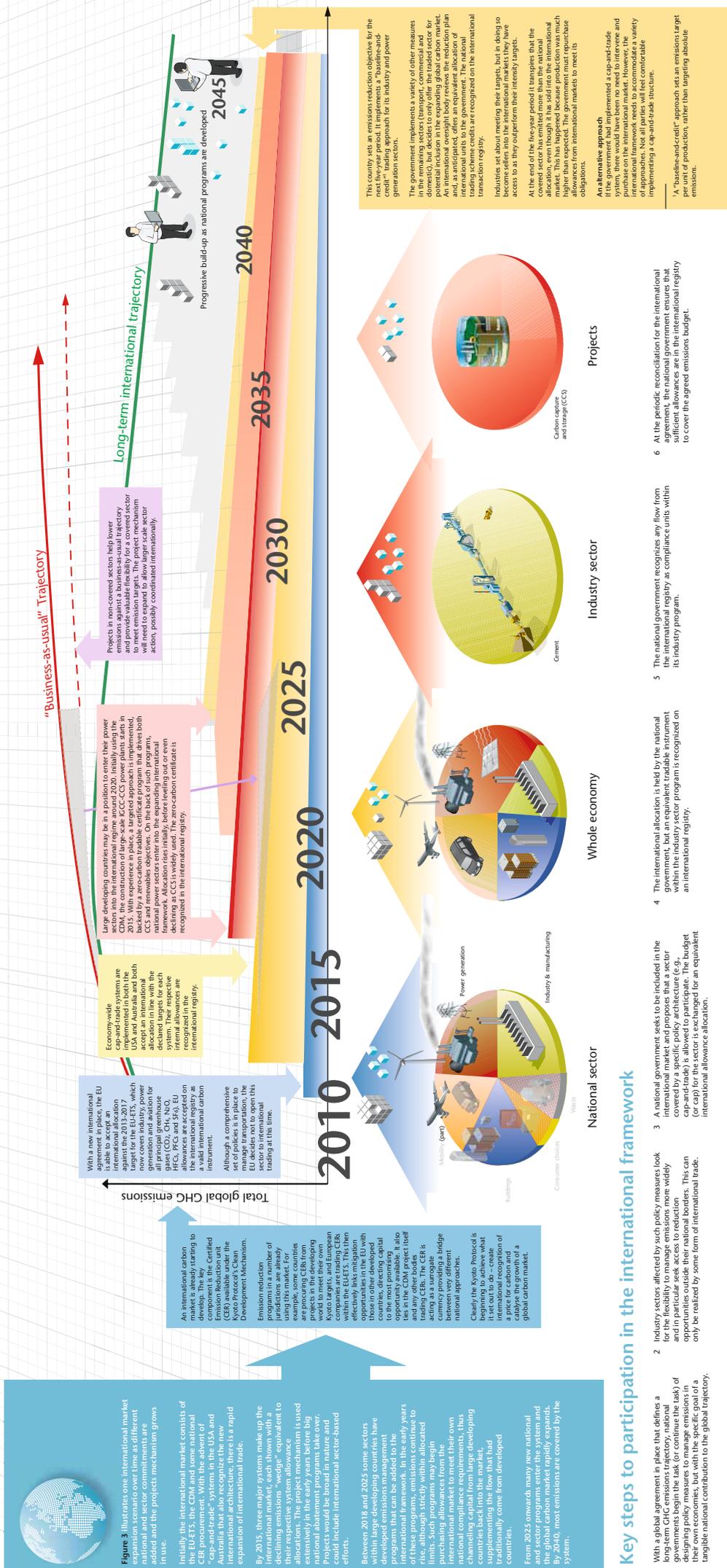
Figure 2: Pathways to 2050



### Similarly structured systems

In order to link, similar structural elements must exist. Important considerations include:

- Pricing measures – Despite their attraction in some places, price caps and price floors could undermine linking. A price ceiling in one system would effectively flow through to other systems once met, possibly necessitating the need for a trading gateway. This could further complicate system design and operation.
- Penalties – The penalties for non-compliance must be broadly similar in the linked systems. Each must require environmental make-up of any missed target (i.e., no buy out) in the next compliance period and any fines should be at a similar level.
- Banking and borrowing – Provisions for banking and borrowing should be similarly structured. Limits in one system would be bypassed by trading into a system where any limit in place had not been reached.
- Monitoring and reporting – The monitoring and reporting guidelines in each trading system should follow similar protocols.
- Linkage and offset policies – Ideally, linked systems should not impose any limits on trade flow (e.g., a limit on the percentage from linked systems that may be offered for compliance).
- Legal - An international set of accounting and verification principles, and common contracts.
- Allocation - Different approaches to allocation can exist across linked systems. Grandfathering may be offered in one system vs. auctioning in another. The allocation process does not directly impact trading and price behavior.



Total global CH<sub>4</sub> emissions

With a new international agreement in place, the EU is able to accept an ambitious target for the EU-ETS, which is implemented in both the USA and Australia and both accept an international system. Their respective internal allowances are recognized in the international registry.

Large developing countries may be in a position to enter their power sectors into the international regime around 2020. Initially using the CDM, the construction of large-scale, IGCC-CCS power plants starts in 2015. With experience in place, a targeted approach is implemented, CCS and renewables objectives. On the back of such programs, national power sectors enter into the expanding international framework. CCS facilities are before being put out or even recognized in the international registry.

Projects in non-covered sectors help lower emissions against a business-as-usual trajectory. The project mechanism will need to expand to allow larger scale sector action, possibly coordinated internationally.

2010 2015 2020 2025 2030 2035 2040 2045



This country sets an emissions reduction objective for the next five-year period. It implements a "baseline-and-credit" trading approach for its industry and power generation sectors.

The government implements a variety of other measures in the energy supply sector (including the introduction of potential inclusion in the expanding global carbon market. An international oversight body review the reduction plan and the national carbon market. The national trading scheme credits are recognized on the international transaction registry.

Industries set about meeting their targets, but in doing so become sellers into the international markets they have access to as they outperform their intensity targets.

At the end of the five-year period it transpires that the covered sector has emitted more than the national allowance. The government must therefore purchase allowances from international markets to meet its obligations.

**An alternative approach**  
If the government had implemented a cap-and-trade approach on the international market. However, the international framework needs to accommodate a variety of approaches. Not all parties will feel comfortable implementing a cap-and-trade structure.

**"Business-as-usual" Trajectory**

**Long-term international trajectory**

Progressive build-up as national programs are developed

- ### Key steps to participation in the international framework
- 1 With a global agreement in place that defines a long-term CH<sub>4</sub> emissions trajectory, national governments begin the task (or commence) of developing national carbon markets. The likely of their own economies, but with the specific goal of a tangible national contribution to the global trajectory.
  - 2 Industry sectors, affected by such policy measures look for the flexibility to manage emissions more widely and in places outside their national borders. This can only be realized by some form of international trade.
  - 3 A national government seeks to be included in the international market and proposes that a sector covered by its policy participate in the budget (or cap) for the sector is exchanged for an equivalent international allowance allocation.
  - 4 The international allocation is held by the national government, but an equivalent tradable instrument within the industry sector program is recognized on an international registry.
  - 5 The national government recognizes any flow from the international registry as compliance units within its industry program.
  - 6 At the periodic reconciliation for the international agreement, the national government ensures that sufficient allowances are in the international registry to cover the agreed emissions budget.

Initially the international market consists of the EUETS, the CDM and some national CER procurement. With the advent of cap-and-trade systems in the USA and Australia, and the rapid pace of international architectural, there is a rapid expansion of international trade.

By 2015, three major systems make up the international market, each with their own distinctive system architecture and their respective system allowance allocations. The project mechanism is used extensively in the early years before big national abatement programs take over. CERs could include international sector-based efforts.

Between 2018 and 2025 some sectors within large developing countries have programs that can be added to the international framework. In the early years of these programs, emissions continue to rise, although strictly within allocated limits. Such programs may begin to meet their own national compliance requirements, thus channeling capital from large developing countries back into the market. The flow of allowances from developed countries.

From 2025 onwards many new national and sector programs enter the system and by 2040, most emissions are covered by the system.



## Energy and Climate Trilogy

### Facts and Trends to 2050

Presents key facts and trends related to energy and climate change and outlines corresponding dilemmas. The issues are supported by graphs and projections.

### Pathways to 2050

Provides a detailed overview of potential pathways to reducing CO<sub>2</sub> emissions. Focuses on the EU, North America, China and Japan.

### Policy Directions to 2050

Explores potential policy approaches and mechanisms that might be deployed to introduce the required changes in the energy system.

## About WBCSD

The World Business Council for Sustainable Development (WBCSD) brings together some 200 international companies in a shared commitment to sustainable development through economic growth, ecological balance and social progress. Our members are drawn from more than 30 countries and 20 major industrial sectors.

We also benefit from a global network of about 60 national and regional business councils and partner organizations. Our mission is to provide business leadership as a catalyst for change toward sustainable development, and to support the business license to operate, innovate and grow in a world increasingly shaped by sustainable development issues.

### Disclaimer

This thought piece is released in the name of the WBCSD. Like other WBCSD publications, it is the result of a collaborative effort by members of the secretariat and executives from several member companies. A wide range of members reviewed drafts, thereby ensuring that the thought piece broadly represents the majority view of the WBCSD membership. It does not mean, however, that every member company agrees with every word.

Secretariat  
4, chemin de Conches  
CH-1231 Conches-Geneva  
Switzerland

Tel: +41 (0)22 839 31 00  
Fax: +41 (0)22 839 31 31

E-mail: [info@wbcسد.org](mailto:info@wbcسد.org)  
Web: [www.wbcسد.org](http://www.wbcسد.org)

WBCSD North America Office  
1744 R Street NW  
Washington, DC 20009

Tel: +1 202 420 77 45  
Fax: +1 202 265 16 62

E-mail: [washington@wbcسد.org](mailto:washington@wbcسد.org)