

Sectoral approaches to address climate change: more than wishful thinking?

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1. Introduction

Since 2005, there has been increasing interest in ‘global sectoral approaches’ to address climate change. Key developments have been the 2005 OECD high-level roundtable on transnational sectoral agreements for climate policy and the July 2005 G8 Gleneagles Plan of Action. In parallel, there have been calls for the analysis of sectoral dimensions, including ‘competitiveness’ issues and sectoral approaches within the negotiations of the UN Framework Convention on Climate Change (UNFCCC). One of the earliest example of sectoral approaches can be found in the sectoral task forces under the Asia-Pacific Partnership on Clean development and Climate (APP, 2007 [1]; Fujiwara, 2007 [2]). Sectoral approaches have been prominent during the global climate change negotiations in Bali, Indonesia in December 2007. The Bali Action Plan includes a specific reference to sectoral approaches, thereby ensuring that they are part of the negotiations for the post-2012 agreement. Among other it calls for “nationally appropriate mitigation actions” (NAMAs) by developing countries in addition to technology transfer, so-called sustainable development policies and measures and reductions from avoided deforestation, which all have a sectoral focus. After the Poznan negotiations that ended in December 2008, main focus is on sectoral crediting, technology collaboration at sectoral level and NAMAs, including financial and technological assistance by developed countries to developing countries.

2. Why sectoral approaches?

Within the EU, the communication on climate change prepared by the European Commission (2007a) [3] for the March European Council that subsequently adopted the EU integrated climate and energy policy made explicit reference to “sectoral approaches” albeit within the context of “action in developing countries”. The European Commission’s High-Level Group on Competitiveness, Energy and the Environment in its fifth report (European Commission, 2007b, p. 3 [4]) called for a “roadmap ... to set out the route to operationalise sectoral approaches”. Finally, the revamped EU Emissions Trading System post-2012 in Article 10b that deals with “measures to support certain energy intensive industries in the event of carbon leakage” states that any “binding sectoral agreements ... subject to mandatory enforcement arrangements” shall be taken into account if

measures countering carbon leakage are designed. In the so-called Copenhagen communication (European Commission, 2009a, p. 6 [5], the European Commission suggested to use sectoral approaches as “a tool in the analysis and development of mitigation options” (i.e. sectoral crediting) and generally remains open to use sectoral approaches in a number of additional ways including to aggregate developed countries’ national targets or even to strike binding sectoral agreements among different countries (European Commission, 2009b, Annex 14, p. 73) [5A].

Even in absence of an agreed global long-term target, the urgency of addressing climate change is now accepted. This has been reiterated by Gleneagles and Heiligendamm G8 summits, the Major Economies Meetings, or through the reference of the Bali Action Plan to the work of the IPCC Fourth Assessment Report. At the same time, global CO₂ emissions from energy production and use are expected to grow rapidly. For example, the 2007 World Energy Outlook by the International Energy Agency (IEA, 2007 [6]), representing all OECD countries, projects that if governments stick with current policies – the world’s primary energy needs would grow by 55% between 2005 and 2030, at an average annual rate of 1.8% per year. As fossil fuels are expected to remain the dominant source of primary energy, accounting for 84% of the overall demand increase, global energy-related CO₂ emissions between 2005 and 2030 are projected to grow too. CO₂ emissions are expected to rise by 57% between 2005 and 2030. Developing countries, whose populations and economies are growing fastest, would contribute 74% of the increase in global primary energy use in this scenario. If greenhouse-gas concentrations are to be stabilised at a level that would prevent dangerous interference with the climate system, there is no doubt that urgent action is needed.

As the International Energy Agency (IEA) (Baron et al, 2007) [8] notes, implementation of binding emissions reduction targets such as in the EU and other developed countries has led to the search of a solution for issues such as competitive distortions and carbon leakage due to asymmetric carbon policies. Sectoral approaches are currently being explored as they are seen as to

- moderate competitiveness concerns in trade-exposed industries e.g. by engaging sectors on a more global basis;
- therefore enhance the scope of greenhouse gas mitigation especially in emerging economies, through sector-specific objectives and

instruments, and in addition

- build commitments (e.g. targets) from a bottom-up sectoral analysis, which is seen as being potentially more equitable.

Some industrial sectors are concentrated to such a degree that even a small number of companies represent a significant share of global emissions (see Box 2.1). A focus on major companies in a limited number of sectors holds out the promise to cover a relative big part of the emissions with one single policy that applies across borders while moderating competitiveness concerns.

Box 2.1 Candidates in industry for sectoral approaches

Aluminium 0.9% of world GHG emissions (2004)
10 biggest producers = 54% of the world market

Cement 4.6% of world GHG emissions (2005)
10 biggest producers = 25% of global output

Steel 5.22% of world GHG emissions (2005) [direct emissions only]
10 biggest producers = 26% of global output
20 biggest producers = 35% of global output

Other potential industries include other energy-intensive industries such as float glass, a few heavy chemical industries, paper and pulp.

Source: Vieillefosse (2007) [7], Baron et al. (2007) [8].

3. Typology of sectoral approaches

However, there are numerous sectoral approach initiatives and models. They can be distinguished into:

- Bottom-up government-led *country commitments*, possibly combined with no-lose targets for developing countries,¹

¹ Developing countries accept voluntarily a reduction target and reduction units that go beyond the targets will be “credited” and allocated to either industry or governments which can sell them into carbon markets.

- Top-down *sectoral crediting* as an incentive mechanism, e.g. sectoral Clean Development Mechanism (CDM).
- *Global sectoral industry approaches* e.g. transnational industry-led approaches that aim at engaging a sector on a broad international basis or global sectoral industry approaches (“Sector-wide transnational industry approaches” according to the IEA typology).

Each concept will be introduced in following sections.

3.1. Government-led sectoral approaches

The discussions about global sectoral industry approaches have been fuelled by a number of concepts involving elements of general sectoral approaches. Most of these approaches give emphasis on the role of a government

- One model is the “no-lose” target concept for example promoted by the Center for Clean Air Policy (e.g. Schmidt et al., 2006 [12]). It describes a bottom-up method for encouraging sector-wide actions in developing countries, mainly emerging economies. Developing countries accept voluntarily a reduction target, for example, expressed in absolute or relative terms. Reductions that go beyond the targets will be “credited” to either industry or governments and can be sold into carbon markets. The incentive for reducing GHG emissions is the potential reward in the form of credits. A CCAP (2006) [13] study has identified what are claimed to be cost-effective emissions reductions in Brazil, China and India from electricity, cement, transport, paper and steel industries by 17 to 29 percent below business as usual levels in 2020.
- The Washington-based PEW Center on Global Climate Change has explored a concept, which focuses on linking voluntary “bottom-up” commitments to a common global framework. Such International Sectoral Agreements in a post 2012 Climate Framework foresee multi-lateral agreements in which governments commit to actions intended to moderate or reduce GHG-emissions from a given sector via i) one or several stand-alone sectoral agreements, ii) a series of agreements linked under a common framework, or iii) sectoral commitments as a complement to a comprehensive global climate change agreement (see Bodansky, 2007 [16]).

3.2. Sectoral crediting

Another model focuses on incentives for developing countries – emerging economies and others – to take on a unilateral commitment, incentivised by the Clean Development Mechanism (CDM) of possible new crediting mechanisms. This could include the bundling of projects, the definition of a sectoral benchmark, which allows crediting of all projects below the benchmark or crediting for policies that reduce emissions such as a congestion charge or refurbishing of houses. Theoretically, a programmatic CDM could allow for programmatic crediting, i.e. several projects undertaken and submitted to the CDM Executive Board by intermediaries. Closely related to this is sectoral crediting, which has been explored in-depth by the OECD/IEA (e.g. Baron & Ellis, 2006 [15]). This approach foresees that certified emission reductions can be sold into a carbon market such as the EU Emissions Trading System.

3.3. Global sectoral industry approaches

If judged by participation, momentum or public exposure, industry initiatives to date are the most relevant sectoral approaches.

- Discussions are currently taking place within the cement sector in the context of the Cement Sustainability Initiative (CSI) under the auspices of the World Business Council for Sustainable Development (WBCSD). Initially, the initiative focused on a data-gathering exercise called “Getting the numbers right”, including a data base for existing technologies in the sector and a benchmarking system. In a second step, the CSI is moving towards policy proposals and intends to propose possible country or regional baselines, negotiated with governments to form the basis of intensity-based objectives and a crediting system. Governments of emerging economies could engage through no-lose targets, which then most likely would be broken down in sectoral sub-targets. The initiative examines as well on how a cement sectoral approach could fit in with EU climate change priorities and notably the EU ETS.
- The World Steel Association (WSA), formerly the International Iron and Steel Institute, representing some 200 steel-producing companies, including those from China, Russia and India, covering more than 70%

of global steel production, proposed to replace cap and trade emission trading regimes in May 2007 with a sector specific framework that, among other things, encourages the phase-out of obsolete technologies. The WSA has invited governments to support the steel industry's long-term research initiatives for radical new technology solutions by encouraging demonstration and to engage with industry to develop reporting procedures (Jitsuvara, 2007 [9]). According to Baron et al. (2007; 60), under the APP and with bilateral support to China in particular, steel companies have launched a data-gathering exercise to establish indicators for the two main production routes.

- The most comprehensive initiative is the Asia-Pacific Partnership on Clean Development and Climate (APP), formally launched in January 2006. It consists of seven partner countries – Australia, Canada, China, India, Japan, Republic of Korea, and United States of America. The initial six partner countries, i.e. excluding Canada account for 45% of global GDP, 50% of GHG emissions and 48% of global energy use (Government of Australia, 2007 [10]), and produce about 65% of the world's coal, 48% of the world's steel, 37% of the world's aluminium, and 61% of the world's cement. As a multilateral and a regional public-private partnership between industry and governments, APP focuses on the one hand on industry sector co-operation across countries to develop and deploy advanced technologies and on the other, on regulatory reform to remove identified barriers to technology development and deployment. The backbone is sectoral task forces where business, government and scientific researchers cooperate. The APP covers data gathering and benchmarking exercises for three energy supply (cleaner fossil energy, renewable energy and distributed generation, power generation and transmission) and five energy-intensive sectors (steel, aluminium, cement, coal mining, buildings and appliances) (e.g. Fujiwara, 2007; APP, 2007).
- In the aluminium sector, participants in the sectoral approach of International Aluminium Institute (IAI), a group of major aluminium companies worldwide, have set themselves a voluntary objective of achieving a 80% reduction of PFC (process) emissions and a 10% reduction in energy intensity, compared to 1990, by 2010. Having nearly reached the PFC reduction objective, already, the IAI is considering setting more stringent targets for 2020. Discussions are being pursued within the industry on the potential applicability of a global sector

crediting, no-lose model. The approach is based on an externally audited, comprehensive data gathering system, under an IPPC recognized protocol, from which the sector benchmark is developed (Porteous, 2007 [11]).

Additional initiatives exist such as the International Energy Agency (IEA) benchmarking exercise in the context of the implementation of the Gleneagles Plan of Action (GPOA).² Some stakeholders in the power sector are exploring the potential for a coordinated sectoral approach to mitigate GHG emissions.³

- A different model aims at setting global standards of specific products such as appliances, insulation or cars (e.g. CO₂ or fuel efficiency). Examples are renewable energy quotas or feed-in tariffs but also EU or global energy efficiency or car efficiency standards.
- Other schemes aim at developing international cooperation on the special transport modes of aviation or maritime transport, sectors that have been excluded from the Kyoto Protocol (e.g. WBCSD, 2004 [20]; Åhman, 2008 [21]; Zetterberg, 2008 [22]).

As industry-led approaches are the most developed initiatives, the following analysis will concentrate on this category.

4. Global sectoral industry approaches: common elements

Without doubt, the different industry-led models as well as all other sectoral approaches will evolve and develop as work on sectoral approaches within sectors and governments progresses. Irrespective of which model is preferred, there are a number of central elements that are common to all sector-wide industry approaches to date.

- Transparent, i.e. that respects confidentiality, collection of information

² The IEA has been tasked by the Gleneagles G8 summit to identify best practice and indicate potential for improvements in energy efficiency in buildings, appliances, transport and industry. As a result, the IEA has embarked on an in-depth analysis of indicators to provide “state-of-the-art” data and analysis on energy use, efficiency developments and good policy practices.

³ For example work undertaken by the Japanese power industry (Tachibana, 2007 [14]) focuses on i) keeping energy efficiency in existing plants, ii) deploying best-available technology to new power plants and iii) accelerate research, development and deployment.

and data (verified) about the status of a sector, e.g. benchmarking in different forms such as i) setting the sector boundaries, ii) documenting current industry performance on agreed simple metrics or key performance indicators, iii) identifying best-practice, i.e. comparing performance of equipment, plants or countries to this best practice, which in the longer-term could help identifying common medium-term goals.

- Sharing and spreading of best practice within companies to increase operational efficiency, including diffusion of technology within the sector, typically to improve performance of the least efficient installations.
- A third key element is the attempt to engage governments and notably big installations of major industries in emerging economies, which is where most of the emissions growth and the reduction potential lies. Incentives to major industries can take many different forms.⁴ They can include for example, technical assistance to improve operational efficiency or carbon management to exploit no-regret options, access to improved technology through speeding up of technology diffusion (of on-the-shelf technology/know-how) and/or developing sector-based GHG credits, e.g. through sectoral crediting or sector-based (CDM) crediting.

There are potential and actual additional benefits from sectoral approaches, although they do not apply to all initiatives and models.

- Sharing of best-practice of *governments* in order to remove regulatory and other barriers to rational energy use and technology diffusion. By definition this element is limited to initiatives that involve governments in some form. Most prominent is this element in the APP.
- Joint learning between governments and business to better understand each other and jointly solve the problem of climate change.

⁴ They can include for example, technical assistance to improve operational efficiency or carbon management to exploit no-regret options, access to improved technology through speeding up of technology diffusion (of on-the-shelf technology/know-how) and/or developing sector-based GHG credits, e.g. through sectoral crediting or sector-based (CDM) crediting. They could also consist of threats for regulation.

- In some cases, sectoral approaches include co-operation in development of new breakthrough technology, for example, the case in the WSA CO₂ breakthrough programme.

As a side-effect, the use of benchmarks that are at the core of sectoral approaches could add a rational element for definition of national goals and commitments, cap-setting and allocation in case free allocation is chosen as an allocation methodology. Data definition and collection from sectoral approaches will provide governments a more thorough base for abatement potentials in a given sector to allow them to set targets potentially in a more equitable way while ensuring that targets are achievable.

5. Main challenges for global sectoral industry approaches

However, in order to live up to expectations, sector-wide industry approaches as well as sectoral approaches at large will need to meet a number of tests. We have identified four crucial challenges that global sectoral industry approaches will need to meet in order to go forward.

5.1. Data definition, collection and use

As a micro-level analysis, benchmarking is very data-intensive. Existing transnational industry approaches are designed as bottom-up schemes to collect information about the status of a sector, e.g. performance benchmarking. Therefore, there is rich experience regarding data collection and use within existing global sectoral industry approaches such as the ones under the auspices of the World Business Council for Sustainable Development (WBCSD) CSI, the IAI and the WSA in addition to APP. The CSI for example has started a data gathering exercise – “Getting the numbers right”. Participating companies will need to provide data for all their plants, for the years 1990, 2000, 2005, as a start. In parallel, the APP task force on cement is also collecting energy and CO₂ data in partner countries. Both initiatives use the WBCSD Cement CO₂ protocol. Similar initiatives are undertaken by the IAI and the WSA.

5.2. Risk of anti-competitive behaviour

Global sectoral industry approaches almost by definition represent a form

of sector-wide coordinated activity. This in return may raise anti-trust concerns in different national or regional jurisdictions. There is a risk that the potentially expanded roles of industry groupings or associations may raise antitrust concerns not only because they represent a sizable part of the global market but also the co-operation moves closer to issues that relate to how the market functions. This can be solved by the use of independent third parties to protect confidentiality of participants' information.

5.3. Incentives to emerging economies industries

A precondition for global sectoral industry approaches to achieve one of its two main objectives, namely enhancing the scope of greenhouse gas mitigation, is participation of major companies of key energy-intensive industries in emerging economies, where most of the additional emissions will come from. However, developing country governments may see sectoral approaches as a means to push them to binding commitments.

Engaging of emerging economies companies will therefore depend on suitable incentives. They could include on the one hand transfers through crediting mechanisms between developed and developing countries and on the other, sector-level co-operation to focus on improving performance of the least efficient companies.

Yet even if these incentives work, they depend on a number of preconditions.

- Sectoral crediting and/or the no-lose target concept depend on data availability and collection, especially for the initial baseline data in industry in emerging economies.
- A second concern is developing country governments' capacity to deal with the complexities of crediting. Already the CDM in some cases tested the capacity of developing country governments. Sectoral crediting would be even more challenging.⁵

⁵ Establishing a proper methodology can be technically tedious while politically contentious. Baron et al. (2007) assume that because of diversity among countries and sectors as well as complexity, sector-wide crediting will require a political "deal" at country, i.e. party level to set up the effort based on which credits would accrue. Such a deal could be made within or outside the UNFCCC framework.

- Crediting would reinforce the competitive advantageous position of big companies of emerging economies vis-à-vis companies in Annex I. Many industry sectors in developed economies regard “massive” crediting as a subsidy to their competitors in emerging economies and thereby may reinforce rather than reduce competitiveness impacts on their business. Again, some sort of political deal would be needed, e.g. a departure from ‘pure’ crediting by setting more ambitious baselines (e.g. beyond business-as-usual) or to set a sunset clause or to develop a graduation threshold for developing countries beyond which they cannot claim credit for undercutting business-as-usual emissions. Whether this generates sufficient incentives is an open question.

5.4. Governance

Sectoral industry approaches face various governance⁶ challenges, notably at the level of industry itself, in developing countries/emerging economies and within the UNFCCC secretariat. Another critical issue is the administrative capacity in some developing countries, i.e. how governments in emerging economies and developing countries in general can implement not only monitoring, reporting and verification but also baseline setting and enforcement. Precondition for governance challenges to be met is that the UNFCCC secretariat or another organisation that is tasked as secretariat for a global climate change agreement will be able to handle the technical complexities surrounding sectoral approaches. Negotiations under the UNFCCC to date are political negotiations, where negotiations on technical issues tend to be delegated. Many existing non-Annex I delegations might find it difficult to handle the technical complexities that a sectoral approach for cement, aluminium or steel involves (e.g. Baron et al., 2007; Bradley et al., 2007 [23]).

⁶ All sectoral approaches we have reviewed here could theoretically be conceived either as a separate, i.e. standalone pillar in an overall global policy framework, e.g. sectoral industry agreements as part of the post-2012 framework or as a complementary, perhaps cross-cutting element of national, regional or international policies and frameworks. Ultimately, the two may even converge. A third possibility is to regard sectoral approaches as an intermediate step between now and the agreement of a comprehensive global agreement. Given that sectoral approaches are very data-intensive and complex, it is however unlikely that government and stakeholders engage in such a time-consuming exercise for a transition period only.

6. Global sectoral industry approaches under the UNFCCC

To date global sectoral industry approaches are mainly bottom-up approaches that attempt to formulate sector-wide commitments. They are only starting to deal with the thorny issue of how to fit them into a global climate change agreement (Baron, Barnsley and Ellis, 2008 [22A]; Baron, Buchner and Ellis, forthcoming [22B]). To date, initial global sectoral industry approaches have the potential to put both national policies and measures and international negotiations onto a firmer footing. This can take various forms, e.g. i) identifying win-win mitigation options, ii) interpreting “common but differentiated responsibilities”, iii) discovering abatement potentials that could unlock the reluctance of some negotiation partners, iv) realising cost-effective solutions, based on a good industry understanding, or v) making efforts comparable. Global sectoral industry approaches could also become a tool for the development and deployment of technologies. The WSA CO₂ breakthrough programme is the best-known example of such an approach. This could also include the development of a joint protocol for example to be approved by the UNFCCC as has been the case with the aluminium protocol.

Any link of sectoral approaches to a global agreement will most likely need to rely on a high degree of both intergovernmental and industry co-operation with enforcement ensured by national governments. This could either be done within a “pledge-and-review” model or possibly even combined with some sort of inter-governmental co-operation framework.

Another issue, which has been explored in greater depth by e.g. the OECD/IEA is the risk of creating sectoral “CO₂ havens”. One of the fundamental principles of global climate change policy is to ensure equal costs on different emitting activities. Different marginal abatement costs between sectors increase the overall economy-wide costs in achieving a given climate change target. A solution will need to be elaborated in the way sectoral industry approaches are linked to GHG emissions trading schemes or more generally, the global carbon market.

One of the biggest challenges would be to meet the criteria of environmental effectiveness (for environmental criteria see Bodansky 2007 [16]). Sectoral approaches would enlarge the coverage of global GHG emission reductions by addressing mitigation potential untapped in

industrial sectors in non-Annex I countries. On the other hand, the environmental effectiveness of such approaches depends on how they are designed on its own and linked to GHG emissions trading schemes. If sectoral approaches introduce sectoral targets possibly combined with a cap-and-trade scheme, there will be a choice between absolute or relative targets⁷. Intensity targets, a type of relative targets often favoured by industry and considered to suit fast-developing economies, enable to avoid economic uncertainty in emission reductions but not necessarily secure environmental certainty in putting constraint on emission growth. Nevertheless, environmental outcomes may depend on the stringency of the target and the legal nature of the commitment (binding or non-binding) rather than the form of the target (Bradley et al., 2007 [23]). If sectoral approaches introduce baselines possibly combined with a credit-and-baseline scheme, there will be a question about where to draw a baseline. It has been suggested that emerging economies may be expected to accept more stringent baselines beyond business-as-usual.⁸ In summary the environmental effectiveness of sectoral approaches needs to be assessed for each initiative and in terms of interaction of design options.

7. Global sectoral industry approaches in an EU perspective

If sectoral approaches will be taken further in the EU, they will need to fit into EU policy priorities. The potentially strongest link between sectoral approaches and EU policies are with the EU ETS and the global carbon market. Benchmarks could play a useful role for cap-setting (i.e. agreeing overall target) and/or allocation, i.e. distribution of the allowances among installations, for the development of global carbon markets and finally as a means to engage developing countries.

- If sectoral benchmarks – understood as a rate of CO₂ emission per unit of intake – production or activity are based on “best practice” or best-available technology in a sector, they can be used for setting the cap for different sectors.

⁷ Absolute targets can be called fixed targets. Relative targets can be called dynamic, indexed, or out-put based targets. For different types of targets see, for example, Watson et al., 2005 [24].

⁸ Setting of a robust baseline, however, would require development of detailed and reliable emission inventories and projections (Sterk, 2008 [25], and also see Bradley et al., 2007 [23]).

- A second possible application of sectoral benchmarks is for allocation, provided that free allocation continues. While initial free allocation of the EU ETS Directive has been based on grandfathering (i.e. based on historic emissions), the new Directive foresees *inter alia* the use of benchmarks for a number of sectors, to be applied in a harmonised way across the EU.
- A third potential application of benchmarks relates to “linked carbon markets”. For the period 2013-2020, before a single global carbon market is expected to be in place, the EU foresees the development of a global carbon market through linking of the EU ETS with other domestic emission trading schemes. Linking however may require adjustment in design options between different schemes. It may be facilitated and accelerated as much as central design options such as MRV⁹, cap-setting and (free) allocation are converging. Sectoral approaches, including benchmarks could provide a means to discuss concrete design options. Sectoral agreements could facilitate such convergence.
- Experiences from data collection and benchmarking exercises under sectoral approaches could possibly become a tool to give a concrete meaning to the Bali Developing Country Paragraph. Both “measuring, reporting and verification” of “actions” to which developing countries have signed up in the Bali Action Plan and “measurable and verifiable” assistance in financing and technology transfer by developed countries – a commitment since the UNFCCC – may be easier implemented at sectoral level.

8. Final remark

Irrespective of whether global sectoral industry approaches as we know them to date will successfully address the challenges that have been identified in this article through their bottom-up and co-operative nature and data gathering they already now positively affect the depth, speed and direction of post-2012 discussions at least in two major ways. First, global sectoral industry approaches have the merit of not only improving hard data on emissions, abatement potentials and costs, but also of illustrating

⁹ Monitoring, Reporting and Verification of emissions.

successful ways to increase energy efficiency and speed up the diffusion of existing technology and the development of new technology. Therefore, they are likely to lead to real GHG emission reductions. Second and perhaps even more important is the fact that global sectoral industry approaches represent a co-operative approach to a thorny global long-term problem. Not few people maintain that co-operative approaches to a politically difficult and technically complex long-term issue such as climate change is more appropriate than the traditional adversary approach that is dominant at least in the western world. Sectoral approaches offer perhaps the ideal way to develop a cooperative approach to climate change mitigation. It is increasingly clear that governments alone will not be able to achieve climate change objectives. Government efforts need to be combined with efforts by other stakeholder notably industry and increasingly so financial institutions.

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