

Submission to Green Paper on a Carbon Pollution Reduction Scheme

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Summary

We wish to express our strong support for the introduction of a carbon pollution reduction scheme at the national level in Australia. This reform is long overdue. A carbon pollution reduction scheme will form an essential part of Australia's response to the problem of climate change and aid in meeting the nation's international commitments under the Kyoto Protocol (and any future agreements) to reduce Australia's contribution to global greenhouse gas production. It is also refreshing to see a change from the language of 'emissions trading' to focus on carbon as a pollution problem requiring stringent regulation.

Despite our overall support for a national carbon pollution reduction scheme we have several concerns with aspects of the proposed design, which we detail in this submission. The concerns we have raised draw on our well-established knowledge and expertise in environmental law as academics and professionals in this field. In particular, we make submissions concerning:

- The **short-to-medium term emissions reduction targets** for the proposed scheme (about which the government is yet to release any details);
- The extensive proposed **allocation of free permits** to trade-exposed and emissions-intensive industries, which could substantially undermine the environmental effectiveness and equity of the scheme;
- The decision to create Australian **emission units as a property right**, which could expose the government to substantial compensation claims if it becomes necessary to buy-back permits (as has occurred in the area of water management);
- A lack of clarity as to the inter-relationship between the scheme and **renewable energy policy**;
- The absence of detail concerning the nature of the proposed **compliance and enforcement regime** for the scheme; and
- The importance of the scheme considering the **imperative of integrated environmental management** so that it is seen as an element of a coordinated approach to addressing climate change impacts, rather than as a self-contained regulatory measure.

Targets

We respect the government's decision to release the Green Paper prior to information on the proposed emissions reduction targets for the scheme in the interests of promoting wide-ranging consultation and community engagement. Nevertheless, the fact remains that it is difficult to evaluate the potential effectiveness of the scheme from an environmental standpoint in the absence of details of the proposed short-to-medium term targets.

Overseas experience with emissions trading shows that, critical to the effectiveness of any scheme, are transparent and rigorous processes of target-setting that generate targets that progressively tighten over time. In determining targets for the scheme, the government should bear in mind the emerging scientific advice, which is in favour of stringent targets in order to avoid dangerous anthropogenic global warming. For instance, the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) calls for a peaking of worldwide emissions in 2015 (2020 at the latest) in order to avoid dangerous climate change.¹ In light of this data, the establishment of strong short-to-medium term targets becomes all the more important.

A second important factor to consider in target-setting is the impact of Australian initiatives on the ongoing international negotiations for a post-2012 agreement to replace the Kyoto Protocol. Australia's domestic regulatory approach is likely to be closely watched by others in the international community. If Australia is to be seen, and act, as an international leader in climate change negotiations, strong domestic targets, which evince a genuine commitment to reduce greenhouse gas emissions, will be vital.

Below we have set out some of the short-to-medium and long-term emissions reduction targets currently being recommended, contemplated or implemented around the world (see Table 1). The Green Paper expresses a desire for the Australian scheme to be able to link with similar schemes in other countries. Accordingly, a compatible approach in target-setting would be advantageous.

Table 1: Comparative targets

Source	Status	Short/medium term targets	Long term targets
IPCC, Assessment Report 4, 2007, Summary for Policymakers	Recommendation	Peaking 2015 for stabilisation at 350-400 ppmv CO ₂ e	50-85% below 2000 levels to stabilise at 350-400 ppmv CO ₂ e
		Peaking 2020 for stabilisation at 400-440 ppmv CO ₂ e	30-60% below 2000 levels to stabilise at 400-440 ppmv CO ₂ e

¹ IPCC, Assessment Report 4, 2007, Summary for Policymakers.

Garnaut Targets and Trajectories Report, 5 September 2008	Recommendation	10% below 2000 levels by 2020 (5% below 2000 levels by 2020 if no comprehensive international agreement)	80-90% below 2000 levels by 2050
Stern Review	Recommendation		50% from current (2005) levels by 2050
G8 Hokkaido Summit Leaders Declaration, 8 July 2008	Political statement		50% reduction by 2050
EU climate change and energy package, Jan 2008	Binding	20% below 1990 levels by 2020 rising to 30% if comparable commitment from other developed countries	
UK Climate Change Bill 2007, currently before House of Commons	Binding when enacted (probably late 2008)	Minimum of 26% below 1990 levels by 2020	60% below 1990 levels by 2050
Germany: Integrated Energy and Climate Program	Binding	30% below 1990 levels by 2020, 40% if comparable commitment by other EU states	
Canada: Turning the Corner Plan	Policy statement	20% below 2006 levels by 2020	
New South Wales Greenhouse Plan 2005	Aspirational target	Reach 2000 emissions levels in 2025	60% of 2000 levels by 2050
Victoria: A Climate of Opportunity, Summit Paper, April 2008	Policy statement	Reduce household emissions 10% by 2010	60% below 2000 levels by 2050
ACT Climate Change Strategy	Strategy	Reach 2000 emissions levels in 2025	60% of 2000 levels by 2050
RGGI (7 US states): Model rules www.rggi.org	Need to be introduced in State law and will cover major energy generators	Stabilisation on 1990 levels by 2014; after that yearly decrease of 2.5%	
California: Executive Order S-3-05	Binding	2000 levels by 2010 1990 levels by 2020	80% below 1990 levels by 2050
Californian major industries: AB 32	Binding	1990 levels by 2020	
Senator McCain: www.johnmaccain.com	Pre-election plan	2012: Return emissions to 2005 levels (18% above 1990 levels) 2020: Return emissions to 1990 levels	2030: 22% below 1990 levels 2050: 60% below 1990 levels
Senator Obama: New Energy for America	Pre-election plan		80% below 1990 levels by 2050

Free permits

While the importance of maintaining a strong economy and the international competitiveness of Australian industries is recognised as part of the general framework of ecologically sustainable development in Australia,² we note with concern the extent of the proposed allocation of free permits to trade-exposed and/or emissions-intensive industries. In particular we would question the need for the issue of free permits to existing coal-fired power generators. The issue of free permits to these entities would amount to a double public subsidy. In the first place, the public as a whole are bearing the externalities of anthropogenic global warming due to pollution (and admittedly the economic benefits of the resources boom). However, the short-term sale of resources may not be a sound basis for a sustainable economy (compare this with California where climate change is considered a business opportunity rather than a business challenge). Second, if polluting industries are to be given free permits (and especially if these are to constitute property rights) then they would have strong market value. This is a windfall gain, especially as the costs of emissions trading regulation are likely to be passed on to consumers. Accordingly, we would reiterate the conclusion of the Garnaut Draft Report that compensating existing coal-fired power generators for the introduction of a carbon price is a 'low priority' (p. 499, Appendix 20A).

The dangers associated with free permit allocation to the electricity sector and other emissions-intensive industries are amply illustrated by experience with the first phase of the emissions trading scheme in the European Union (EU). Although many of the EU scheme's 'teething problems' were specific to the EU as a community of different member states (e.g. non-aligned national allocation plans), some lessons can be applied to a nation state scheme such as the planned carbon pollution reduction scheme. The EU member states gave away 95% of the allocations under the scheme for free, generating a substantial windfall, especially for the electricity sector. This was the case because the electricity sector could pass the additional carbon cost through to the end-user since the power market in Europe (and also the power market in Australia) is essentially domestic. While free allocation did not make a price difference for the end-user as compared to full auctioning of permits, the value of the free allowances produced additional profits for the industries concerned.³ The EU has subsequently decided that all permits in the energy sector will be auctioned from 2013.

Some clarification is also warranted regarding the concept of 'compensation' as it is often used in discussion of the impacts on industry of introducing a carbon price. In the legal context of property, compensation typically arises where there

² National Strategy on Ecologically Sustainable Development (1992), guiding principles.

³ This has been recognised by the Green Paper although only as a problem in conjunction with over allocation, see Box 10.2. See also Christian Egenhofer, 'The Making of the EU Emissions Trading Scheme: Status, Prospects and Implications for Business' (2007) 25 (6) *European Management Journal*, 453, 455; Felix Matthes, Verena Graichen, Julia Repenning, 'The Environmental Effectiveness and Economic Efficiency of the European Union Emissions Trading Scheme: Structural Aspects of Allocation', (2005) *A report to WWF – Executive Summary*, 12-13.

has been a government acquisition of property. We note that the Green Paper consequently uses the terms, 'limited direct assistance', (p. 370) or 'assistance for EITEs' (p. 292). In this context, compensation calls by coal-fired generators and other industries raise the question, compensation for what? There is no compensable acquisition of property, since there is no guaranteed entitlement to pollute, simply a series of government policies designed to support and promote technological change in affected industries, and in certain instances, to protect these industries from unequal competition at the international level. More widely though, to provide assistance still seems to be compensating coal-fired generators for a reduction in their capacity to release harmful carbon pollution into the atmosphere. It is difficult in an era of climate change urgency to regard dispensations and assistance for polluters as a legitimate expectation that should be continued indefinitely in government policy.

Accordingly, if the government is seeking to provide assistance to trade-exposed industries and to the coal industry, then this assistance should be couched in the framework of a subsidy, not in the language of compensation. The former terminology will facilitate an informed and open debate on this question, allowing other equity and parity of treatment concerns to be raised.

Emission units as property

With respect to the proposal to create a property-like entitlement for the purpose of emissions trading the following points should be noted.

(1) What is the basis or foundation of any property right?

Presumably what is being regulated under a cap-and-trade type system, such as the proposed carbon pollution reduction scheme, is air pollution. In this context, it would seem highly undesirable to designate what is exchanged or traded as property, with all the legal and political consequences that this entails. On closer inspection what is really being traded is a government dispensation to polluting industries and activities to continue to pollute so long as they are prepared to pay. While Australian environmental law endorses a 'polluter pays principle', we need to be careful in examining other consequences, such as whether polluting activities ought to be rewarded through the ascription of property rights that continue indefinitely.

(2) Property rights are 'strong' legal rights

Once private property rights are created in an entity such as air pollution (and if courts were to find them equivalent to common law property) then attempts by governments to acquire the rights (or even regulate them heavily such as to effectively 'sterilise' the rights) raise the likelihood that compensation will need to be paid according to the 'just terms' acquisition provisions of the Australian Constitution. This requirement for compensation has two main consequences. First, it severely hampers the capacity for governments to manage adaptively due to financial stringencies, and/or the political unwillingness of governments of all persuasions to compulsorily acquire in controversial arenas. Second, the success of the proposed carbon pollution reduction scheme relies on progressive

lowering of the pollution cap. To institute property rights in such a scheme seems counter-intuitive as it may unnecessarily constrain governments in their efforts to adjust and manage the pollution cap, which is so urgently required in the climate change sphere.

A comparable situation is evident in the water sector where reforms in the 1990s introduced a market-based water trading system designed to address water use efficiency and environmental degradation. Institution of property rights in this situation exacerbated existing over-allocation problems by providing value to what were otherwise 'sleeping' entitlements to water. The federal government is now seeking to deal with the 'market failure' of a trading regime unequal to the task of ensuring both efficiency and environmental outcomes. Further, the Commonwealth has struggled to come up with funds to provide just terms compensation where buy-back of water rights has become necessary for environmental purposes. It is imperative that a similar 'market failure' be avoided in the climate change context.

(3) Property rights are not essential

It is not necessary to invoke property rights to legislate for, regulate and manage an emissions trading scheme effectively. Resource economics, based primarily on Coase's theorem, suggests that where common pool resources exist, then the way to avoid a 'Tragedy of the Commons' is to institute individual property rights. Empirical research now questions whether individual property does achieve the efficiencies and resolution of conflict over common pool resources that are claimed by the theorem, especially where there are significant externalities and third party effects. Further, caution is required if resource economic theories are adopted without due cognisance of the legal implications of adopting property rights. Most tellingly, to adopt a property rights mechanism is to suggest that rights subsist over resources – but should air pollution be treated as a resource? Accordingly, we suggest that consideration be given to a range of legal models to structure the exchange process. These could include consideration of contractual and administrative dispositions to constitute the legal form that is the basis of the secure 'exchange' process.⁴ If a more flexible legal model is adopted, the legislation should provide clear directions to courts on the manner in which the rights are to be interpreted – not simply to leave interpretation to a default situation where courts revert to common law understandings.

Further, we would point out that neither the EU emissions trading scheme, nor the soon to be operational Regional Greenhouse Gas Initiative (RGGI) in the North-East of the US, have opted to make emission allowances property rights.⁵ Both schemes found it unnecessary to create a property right for the entity traded in order to 'promote the development of an efficient and robust carbon market' (Green Paper, 3.3.1). Indeed, linkage between Australia's carbon pollution reduction scheme and other schemes in overseas jurisdictions may be

⁴ D.E. Fisher, 'Rights of Property in Water: Confusion or Clarity' (2004) 21 *Environmental & Planning Law Journal* 200.

⁵ Article 3(a), Directive 2003/87/EC; RGGI Model Rules, Definitions, xx-1.2(k).

compromised by the creation of a permit so different from that in existing international schemes. Typically, market-based systems require comparability between the units traded.

(4) Assumptions of market-based property regime questioned

Many of the prevailing assumptions of a market-based property regime are now being questioned. One of the most successful mitigation and adaptation responses to climate change has been that of the world's fourth largest economy – the State of California, US. That success rests on strong regulation based on scientific knowledge; it was not left just to a 'market solution'. We would stress that sole reliance on a market-based property regime, as demonstrated by experience across many common pool resources, is fraught with difficulties. Any scheme needs to operate within a range of regulatory tools designed to address the complex and integrated problems that climate change brings (see further below).

Intersection with renewable energy policy

Putting a price on carbon through the introduction of a carbon pollution reduction scheme will do much to improve the uptake of renewable energy in Australia. We commend the government's commitment to raise the mandatory renewable energy target to encourage the establishment of more renewable energy generation capacity. Nevertheless, we are very concerned that the Green Paper makes minimal mention of renewable energy policy and seems to proceed on the assumption that the market will take care of this area without the need for additional regulatory measures.

In the first instance it is unlikely that renewable energy technologies will be competitive with coal-fired electricity generation if the permit price is, as predicted, around \$20/tonne of carbon dioxide equivalent. In addition, the combination of (likely) assistance to coal-fired power stations and research funding directed to clean coal technology, effectively acts as a subsidy to coal as a source of energy. In these circumstances, rather than trusting to the market to drive renewable energy development, there is a need for existing policy measures to promote the uptake of renewable energy to be retained and strengthened.

The importance of regulatory measures to support renewable energy development and uptake is illustrated by the policies applicable in a number of jurisdictions (see Table 2). It is notable, for instance, that the medium term target prescribed in the EU's Climate Package of a 20% reduction by 2020 is to be reached mainly by renewable energy use and EU energy efficiency strategies.⁶ In Germany, which has managed a relatively successful introduction of renewable energy into electricity generation (at the moment around 14%) substantial emission reduction targets are pursued via a range of integrated measures. The German Integrated Energy and Climate Program 2007 includes

⁶ Egenhofer, above n 3, 460.

(in addition to the EU emissions trading scheme) a package of Acts, regulations and reports under the guiding principles of energy security, economic efficiency and low environmental impact.⁷ Likewise, California pursues its emissions targets through an ambitious draft plan that centrally features renewable energy.⁸ Again, emissions trading is seen as only one among several measures required to reduce emissions.

Table 2: Comparative renewable energy policies

Country/region	Source	Status	Short/medium term targets	Long term targets
China	Medium and long term renewable energy development plan		15% by 2020	
European Union	EU climate change and energy package, Jan 2008	Binding	20% by 2020	
UK	Part of UK's contribution to EU's climate change package (above); see also UK renewable energy strategy		10% by 2010 15% by 2020	
Germany	Renewable Energy Act 2008 (EEG)	Objective of Act	At least 30% by 2020	45% by 2030 Ongoing increase of renewables in energy mix
NZ	Speech PM Helen Clarke	Government goal	90% by 2025	
California	Draft Plan, Air Resources Board, 26 June 2008	Draft Plan	30% by 2020	
NSW	NRET	Proposal	10% by 2010 15% by 2020	
Victoria	Victorian Renewable Energy Act 2006	Binding	10% by 2016	
WA	Premier's Climate Change Action Statement May 2007		15% by 2020 20% by 2025	
SA	Climate Change and Greenhouse Emissions Reduction Act 2007	Binding	20% of energy generated and consumed from renewable sources by 2014	
Senator Obama	Comprehensive New Energy for America 2008	Plan	10% renewables by 2012, 25% by 2025	

⁷ See Bundesministerien fuer Wissenschaft und Technologie and fuer Umwelt, Naturschutz und Reaktorsicherheit, *Report on Implementation of the key elements of an integrated energy and climate programme adopted in the closed meeting of the cabinet on 23/24 August 2007 in Meseberg*, available in English at http://www.erneuerbare-energien.de/files/pdfs/allgemein/application/pdf/gesamtbericht_iekp_en.pdf.

⁸ California Air Resources Board, *Climate Change Draft Scoping Plan* (June 2008) <http://www.arb.ca.gov/cc/scopingplan/document/draftscopingplan.pdf>.

Compliance and enforcement

The Green Paper notes that a 'vital' component of the carbon pollution reduction scheme will be effective compliance and enforcement arrangements (p. 215). Nonetheless, very little detail is provided as to how the government will ensure that 'the scheme embodies best practice approaches to compliance and enforcement' (p. 216). At most it seems there are plans for the introduction of a penalty regime encompassing civil, and perhaps also, criminal penalties. In addition, the Green Paper mentions the possibility of judicial and merits review of decision-making by the scheme's independent Regulator.

(1) *Penalties*

It is documented in a range of research that monetary penalties, unless they are substantial, are treated as 'operating expenses' by entities that find it in their interest to continue existing modes of operation. For such 'laggard' industries, unless substantial penalties can be imposed, fines may not constitute an effective sanction. In the pollution law area, there has been some success with the adoption of personal liability mechanisms, including personal criminal liability for company directors as an effective sanction mechanism. Consideration should be given to this form of penalty, together with a consideration of other forms of sanctioning along the lines of a typical 'enforcement pyramid'.⁹ Further, it needs to be recognised that there are considerable difficulties that many regulatory agencies face in bringing both civil and criminal proceedings. Such agencies need to be properly resourced, and agency powers of inspection and control should support the compliance and enforcement process. The development of transparent procedures for accounting and point of obligation identification and monitoring are vital.

(2) *Judicial/merits review*

It is encouraging to see that some scope for remedies of judicial and merits review is proposed in the Green Paper as they are likely to be a crucial feature of ensuring the scheme's transparency and decision-making accountability.¹⁰ However, even if judicial and merits review are made available, consideration should be given to opening up these remedies, and enforcement action generally under the scheme, to environmental groups and the broader community. While a strong government enforcement effort is highly desirable, resourcing constraints mean that third parties increasingly play an important role in ensuring compliance by business entities.¹¹

⁹ Ian Ayres and John Braithwaite, *Responsive Regulation: Transcending the Deregulation Debate* (1992).

¹⁰ On the transparency and accountability functions served by actions in the courts see Justice Brian J Preston, 'The Role of Public Interest Environmental Litigation' (2006) 23 *Environmental & Planning Law Journal* 337.

¹¹ For instance, climate change litigation in Australia has been initiated in all instances by not-for-profit environmental groups: see Jacqueline Peel, 'The Role of Climate Change Litigation in Australia's Response to Global Warming' (2007) 24 *Environmental & Planning Law Journal* 90.

Facilitating third party enforcement under the scheme would require special provisions in the legislation. For example, the standing provisions for judicial review might be extended to allow actions to be brought by 'interested persons' or organisations (adopting a similar definition to that in sections 475 and 487 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth)). In addition, there is a need to recognise the resource constraints facing many non-governmental groups undertaking enforcement and compliance action¹² by way of particular legal reforms. These may include prohibiting courts requiring an undertaking as to damages (if one of the remedies available under the scheme is injunctive relief) and allowing court orders exempting litigants from paying costs where cases are brought in the public interest.

Integrated environmental management

Climate change is quintessentially an 'integrated' environmental problem as it encompasses not only carbon pollution and mitigation efforts, but also energy policy, water management, land management and biodiversity conservation. Clearly a carbon pollution reduction scheme will be a key element of new national climate change laws but it would be dangerous to see the scheme as the be-all-and-end-all in this regard. While there is no mention of integrated environmental management in the Green Paper, the importance of such an approach in responding to complex environmental problems, like climate change, has been recognised in the environmental literature for some time.¹³ Consequently, we would draw to the government's attention the crucial need to consider not just the design of a carbon pollution reduction scheme, but how that scheme will interact and coordinate with other aspects of the environmental regulatory framework in the overall task of responding to climate change.

Two significant areas where issues of integration arise are in respect of indirect climate change impacts and coordination with State environmental laws. Indirect climate change impacts refer to the downstream impacts of activities that are not directly caught by reporting or emissions trading requirements. For instance, if a new coal mine is established it may need to account for emissions produced during the construction and operation of the mine. However, the majority of greenhouse gas emissions associated with the mine come at a later stage when coal from the mine is burned for power generation, whether in an Australian plant or overseas. It would seem incongruous for the carbon pollution reduction scheme to make oil companies responsible for downstream emissions from the

¹² Chris McGrath, 'Flying Foxes, Dams and Whales: Using Federal Environmental Laws in the Public Interest' (2008) 25(5) *Environmental & Planning Law Journal* 324.

¹³ See Nicholas Brunton, 'Environmental Regulation: The Challenge Ahead' (1999) 24(3) *Alternative Law Journal* 137; David Farrier, 'Fragmented Law in Fragmented Landscapes: the Slow Evolution of Integrated Natural Resource Management Legislation in NSW' (2002) 19(2) *Environmental And Planning Law Journal* 89; Lakshman Guruswamy, 'The Case for Integrated Pollution Control' (1991) 54 *Law and Contemporary Problems* 41; David Jones, 'The Kyoto Protocol, Carbon Sinks and Integrated Environmental Regulation: An Australian Perspective' (2002) 19(2) *Environmental & Planning Law Journal* 109.

fuel that they produce but yet not to impose the same constraints on coal mines in respect of the downstream impacts of burning coal as a fuel for electricity.

Currently, the principal way in which the indirect climate change impacts of coal mining are addressed is via the environmental assessment and approval provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth). However, indirect impacts of an activity are only assessable under this legislation if they affect a protected 'matter of national environmental significance' such as the Great Barrier Reef. This rather convoluted approach is not ideal.¹⁴ It also raises the broader issue of the need to re-evaluate Commonwealth environmental laws as part of an integrated approach to the management of climate change. The result of such review might be the inclusion of a new assessment trigger in the *Environment Protection and Biodiversity Conservation Act 1999* applicable to projects with substantial direct or indirect greenhouse emissions, or to activities which seek to sequester carbon such as carbon capture and storage projects.

Another area that is absent from the Green Paper is the issue of interaction with State environmental laws. The Green Paper contemplates unitary Commonwealth legislation to implement a carbon pollution reduction scheme, limiting the role of the States and Territories to policy contributions and assistance with coordinated implementation. However, the fact that the scheme is directed to 'carbon pollution' raises important questions about the applicability of, and coordination with, State regulatory regimes. As others have pointed out, greenhouse gases viewed as a *pollutant* readily fit within the existing pollution control laws of States and Territories.¹⁵ These laws apply to individuals and businesses carrying out polluting activities, generally requiring licensing with the capacity to impose conditions on the operation of the activities.

At the very least then, the federal government needs to consider how its legislation will interact with State laws (e.g. exclusion or concurrent operation as is the case for the *Environment Protection and Biodiversity Conservation Act 1999*). Concurrent operation of federal and State laws could allow the latter to deal with some of the planning and operational aspects of polluting activities that are outside the scope of Commonwealth laws. For instance, the carbon pollution reduction scheme will regulate the issue of emissions permits to polluting entities, but State laws could regulate the ongoing operation of facilities, including the mitigation or offset measures they adopt.

With its new laws on climate change, the federal government has an opportunity to put in place a best practice integrated management regime that will respond to the integrated environmental problem that is climate change. While all aspects of integration need not be addressed in the one piece of legislation, laws should be

¹⁴ For discussion see Lee Godden and Jacqueline Peel, 'The Environment Protection and Biodiversity Conservation Act 1999 (Cth): Dark Sides of Virtue' (2007) 31(1) *Melb. Uni. L. Rev.* 106.

¹⁵ D.E. Fisher, 'The Statutory Relevance of Greenhouse Gas Emissions in Environmental Regulation' (2007) 24 *Environmental & Planning Law Journal* 210.

drafted bearing in mind the imperative of coordination with other elements of the regulatory framework. Ultimately, better regulatory coordination to address the long-term challenge of climate change may necessitate new institutional structures that have a capacity for strategic planning and environmental assessment.