

**EMISSIONS TRADING AFTER THE FINANCIAL  
CRISIS:  
WHAT SHOULD AUSTRALIA DO?**

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Growth and Climate Change Policies in Australia

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## **EMISSIONS TRADING AFTER THE FINANCIAL CRISIS: WHAT SHOULD AUSTRALIA DO?**

The issue of climate change remains a vexed one on the international and Australian agenda, even as the key UNFCCC meeting in Copenhagen in December 2009 approaches rapidly. On the one hand the commitment of President Obama to emissions reductions and to new energy technologies has raised hopes, but most leaders remain heavily focused on the financial crisis. In Australia the Government's plans as expressed in the White Paper face an uncertain future in the Parliament, and continue to attract opposition from both sides of the debate. This paper makes some suggestions about how we might proceed from here, in the wake of the financial crisis.

### **Background to Australia's Target**

1. Climate change remains an issue of fundamental importance, as signs of major damage to the environment mount. Holding peak global warming to no more than 2°C relative to pre-industrial is a necessary condition for avoiding 'dangerous climate change', but a lower level might be required to achieve that end.
2. Using standard approaches, achieving this minimum condition (with a 50% probability) requires stabilising the atmospheric concentration of GHGs at no more than 450 ppm CO<sub>2</sub>-e. But the concentration is already at 450 ppm CO<sub>2</sub>-e, and emissions are well above the level required to stabilise GHG concentration, and are still rising. Hence the goal cannot be achieved by seeking to stabilise the GHG concentration in the future.
3. Given these two facts the stabilisation approach explicit in the UNFCCC Framework Convention (Chart 1) is no longer appropriate. Rather, a dynamic, risk-based approach directly focused on a temperature target should be adopted (Chart 2), with the following characteristics:
  - based explicitly on a concentration overturning path, and hence on getting global emissions down below the stabilisation level;
  - based on the objective of reducing emissions in all major countries to zero by 2100;
  - based initially on a temperature target for peak warming of no more than 2°C, with reductions in temperature below the peak; and
  - incorporate a learning process, so that both the temperature target and the required emissions paths are revised as new information comes to light on climate sensitivity (warming per unit of concentration) and on damages from a given level of warming.
4. In the wake of the financial crisis, the Obama budget targets for emissions (reductions relative to 2005 of 14% by 2020 and of 83% by 2050) would, if achieved by the OECD countries as a whole, provide for a range of viable emissions path for developing countries which would be consistent with holding peak warming to 2°C. It is also worth noting that if developed countries brought emissions to only 17% of their 2005 level by 2050 the goal of zero emissions before 2100 is well and truly within reach.

5. This means that, taking account of more rapid growth in population and GDP, an Australian commitment at Copenhagen of a reduction in emissions relative to 2000 of 15% by 2020 and of 80% by 2050 would be consistent with a viable global effort to hold warming to no more than 2°C, and would enable Australia to take a co-leadership role to that end (Chart 3).

### **Achieving an Australian Target**

6. Climate change raises major issues of market failure. This is not just in terms of emissions as an externality, for market failures are rife throughout the energy, transport and emissions systems (Chart 4). The main market failures appear to be
  - heavy sunk costs in power generation, transport and many other areas;
  - major coordination failures, again in the electricity sector, transport and other areas; and
  - widespread externalities and information failures.
7. The presence of pervasive market failures means that, while an ETS or a carbon tax is an important step to internalise a major externality, the other market failures must also be addressed for an efficient outcome to be achieved. In the presence of such market failures an ETS would require a higher carbon price, than would otherwise be the case, to achieve a given emissions reduction (or a given carbon tax would achieve a lower reduction in emissions). A carbon price is a necessary but not a sufficient condition for efficient emissions reduction.
8. Two main points emerge from the financial crisis for climate policy in Australia:
  - in an atmosphere of uncertainty and rising unemployment, it is desirable to hold the carbon price to the lowest level possible, and to provide the greatest possible certainty about that price; and
  - with falling business investment, new programs of public and private investment will be necessary to support the Australian economy beyond the resources boom.

The need to limit the increase in the carbon price and provide as much certainty as possible is also reinforced by the issues that electricity generators face in refinancing large debt levels in the current situation.

9. The recent US commitment to establish an ETS increases the chance that an extensive ETS network will be set up around the world, and Australia should be prepared to participate in such a network. However, in the light of the economic situation and of the need for certainty, the Government should adopt the fallback recommendation of the Garnaut Review. This involves setting up the ETS from 2010 but fixing the price for an emissions permit for the first three years. In my view this should be at a fairly low level, say \$20 per tonne indexed by the CPI. This would begin to implement an ETS while enabling Australia to observe developments overseas, and also start to establish a carbon price.

10. To achieve the target of reduction in emissions, relative to 2000, of 15% by 2020 and 80% by 2050 strong action to address the other market failures will also be necessary. These complementary policies should be designed as the most effective way of addressing identified market failures. Standard methods include
  - for sunk costs, accelerated depreciation allowances in certain types of energy and emissions efficient plant and equipment, or other public support measures;
  - for externalities, internalisation by price or tax measures, or recognition of full social costs and benefits in public investment programs;
  - for coordination failures, public investment in, or support for private investment in, appropriate network infrastructure or coordination systems;
  - regulation can be an effective response in many cases.
  
11. With a limited carbon price initially, the Government should focus on these market failure policies to achieve the 15% reduction by 2020 target. The precise policies need further investigation, but might include
  - accelerated depreciation allowances for certain types of emissions intensive plant and equipment;
  - government funded investment programs in key areas, such as transport infrastructure and network infrastructure for renewable energy;
  - the use of advanced regulations to drive change, for example in fuel emissions standard and building codes.

More generally, further consideration needs to be given to the most effective means of encouraging renewable energy in the current context.

12. The White Paper and the associated Treasury modelling virtually ignore transport in achieving emissions reduction targets to 2030. This is because transport is price insensitive, given the extent of market failures in the sector. In the modelling of the CPRS-5 scenario, transport emissions are 40% higher in 2030 than in 2005, with only very little variation from the base case (Chart 5). With transport emissions accounting for 17-18% of total emissions on a full life-cycle basis, this is not consistent with achieving a strong emissions reduction.
  
13. Transport is a particularly interesting case, in economic and social terms. While a massive shift took place from road to rail by the 1960s (Charts 6 and 7), there is a case that in many circumstances advanced rail is the most cost-effective transport mode. Further Australia's current transport pattern imposes massive social costs, which we estimate as about 5% of GDP before accounting for congestion costs (Charts 8 and 9), heavily centred in road transport. Hence action to move from road to advanced clean rail offer potential economic and social benefits as well.
  
14. Recent modelling work at the Centre examined the economic and social benefits of action to achieve three changes:
  - holding the volume of non-bulk freight carried by articulated trucks after 2010 to its 2010 level, with the growth transferred to rail;

- transferring half of the growth in projected passenger kilometres in cars after 2010 to public transport, both rail and bus; and
- increasing the degree of electrification of the rail network, and making greater use of clean energy sources, over 2010-2020.

While some indications are available, we have no firm estimates of the public and private cost of achieving these changes. But even using an upper bound estimate of \$20 billion for this cost the implied social rate of return on this investment is over 50%.

15. The same modelling also showed that, if parallel action (such as by regulation) were taken to reduce the overall emissions per unit of activity in road and air transport by 10% relative to the base case by 2030, transport emissions peak in about 2025 and then fall, and are about 20% lower than in the base case by 2030 (Chart 10). These estimates suggest that in transport the appropriate policies can make a significant contribution to reducing total emissions, as well as generating a strong social return.

## **Changes to the Emissions Trading Regime**

16. It is widely accepted that there are two main flaws in the December 2008 White Paper: the fact that massive support is provided to coal-based electricity generators without any conditions other than that they maintain their productive capacity and both the scale of the free permits provided to Energy Intensive Export Industries and the conditions under which they are provided. It is suggested that, in present conditions, both of these need to be adjusted to be consistent with achieving a stronger target.
17. The Electricity Sector Adjustment Scheme (ESAS) is to provide assistance to coal-based electricity generators through the issue 130.7 new permits over the first five years of the ETS, valued at \$3.9 million in total, of which four Victorian brown coal generators would get about \$2.75 million. For an eligible generator the only conditions to be met are that they maintain their generating capacity over the period and submit to a windfall gains review process.

Even if reduced by a lower permit price, this is extremely generous assistance, which can and should be used to generate major change in generator behaviour. This could be achieved by all eligible generators being required to prepare a strategic adjustment plan, in which they would specify a range of actions (emissions reductions, progressive transfer to cleaner energy sources such as gas or renewables, further R&D immediately relevant to business change, and so on). Such a plan would need to be agreed with the relevant State Government and the Australian Government before issuance of permits commences, and achievement of annual targets would be a pre-condition for annual issuance. Such performance based adjustment assistance could generate quite rapid change in energy mix and in emissions, especially in such key areas as the Latrobe Valley.

18. As in the Garnaut Review, the White Paper includes a scheme for the issue of free permits to Energy Intensive Trade Exposed (EITE) industries, but both widens the

eligibility conditions and reduces the carbon productivity contribution from 3% per annum to 1.3% per annum. The result is that, especially for more aggressive emission reduction targets, the EITEs gain the lion's share of permits, forcing more and more of the adjustment on to other sectors. For example, if the reduction target is 15% and the ETIE sector grows at 5% per annum (including agriculture), by 2020 the permit allocation for all other industries is down by 57% relative to 2010 (Chart 10 and Table 1). This would be intense adjustment indeed.

Revisions to this scheme are inevitable for a viable ETS in Australia. With a fixed emissions price for the first three years, and strong complementary policies reducing the long-term emissions price, a less generous scheme is appropriate. A return to the productivity factor of 3% per annum in Garnaut is also entirely justified, as there are many ways of gradually reducing the emissions intensity of such industries.

### **Costs and Benefits (Damages Avoided)**

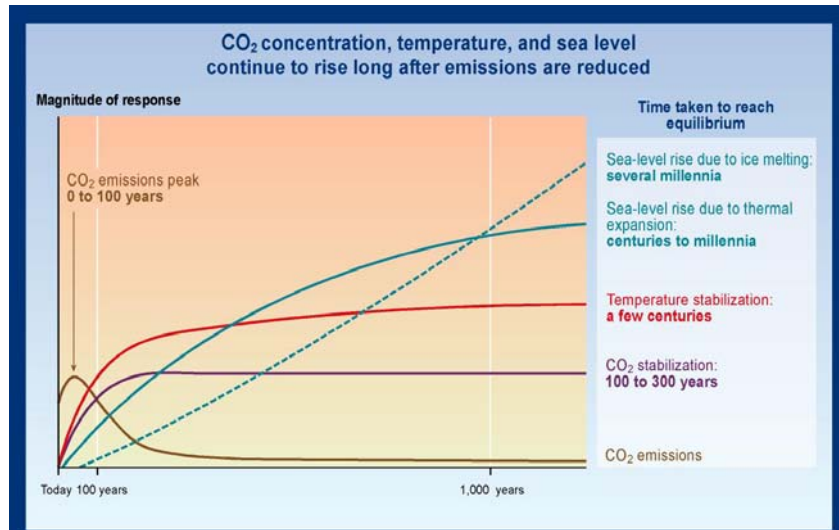
19. The standard approach is to attempt to measure both the economic cost of taking action to reduce emissions and the benefits from lower warming, in the form of damages avoided. The Garnaut Review, for example, undertook an ambitious attempt to model both mitigation costs and the benefits of market damages avoided out to 2100, and found that there were positive net costs of mitigation (the costs of mitigation less the assessed market damages) out to about 2070, with small positive net benefits thereafter. Hence the case for mitigation is based on very long term insurance and on the value of the damages that cannot be measured.
20. In my view both sides of these calculations are very dubious. There is growing evidence that the costs of global warming to Australia might be very high indeed, but the task of accurately measuring those costs in the long term is virtually impossible. While more progress might be made with a risk-based approach, our quantitative knowledge will always remain limited.
21. Modelling the costs of mitigation depends critically on the technology regimes assumed, and the Garnaut Review used both a standard set of technology regimes and an enhanced technological regime. Costs are incurred as the economy is forced to use substitute higher cost but less polluting processes for the lower cost ones based on fossil fuels. But the characteristics of the new technologies, longer term, are impossible to foresee, and this approach ignores Schumpeterian effects – that is that the process of creative destruction of old technologies and their replacement by new ones drives a new era of economic growth.
22. If the developed countries do indeed commit to reduce emissions by 80% by 2050, and to subsequently eliminate emissions, this will involve massive investment in a whole new generation of technologies and processes. Much of the world's economic infrastructure needs to be rebuilt, and much of its plant and equipment replaced. President Obama's commitment of US\$900 billion for such new technologies in the Budget is recognition of this fact, and will also drive the process along. Developing countries such as China will scramble to compete in emerging industries, as we have recently seen with China's announcement of

plans for the electric car. There is no reason to assume that adjusting to climate change will impose a cost; rather it will usher in the next era of economic growth.

23. It would have been impossible before the Industrial Revolution to calculate the likely costs and benefits involved. One could not have foreseen the nature of the world that would unfold, the characteristics of the new technologies or industries nor even the costs involved. We face a similar situation with climate change. We know that the human community faces grave if largely unquantifiable risks, and that major economic benefits could arise from reshaping the world's technologies and processes. In these terms the situation is clear, and detailed costing efforts will not take us much further. It is time to get on with it.

### Charts and Tables

**Chart 1. CO<sub>2</sub> concentration, temperature, and sea level continue to rise long after emissions are reduced**



**Chart 2. The nature of the control problem: the need for a dynamic approach**

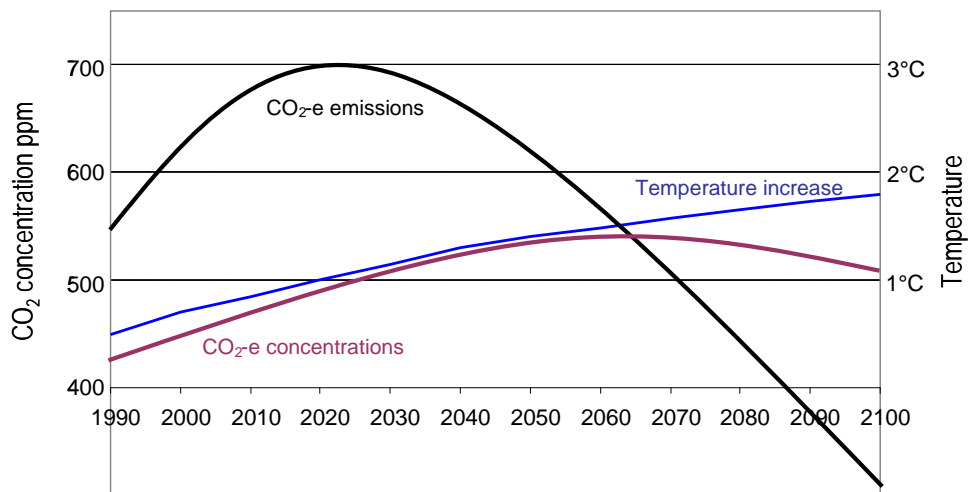


Chart 3. Indicative trajectory and 2020 target range

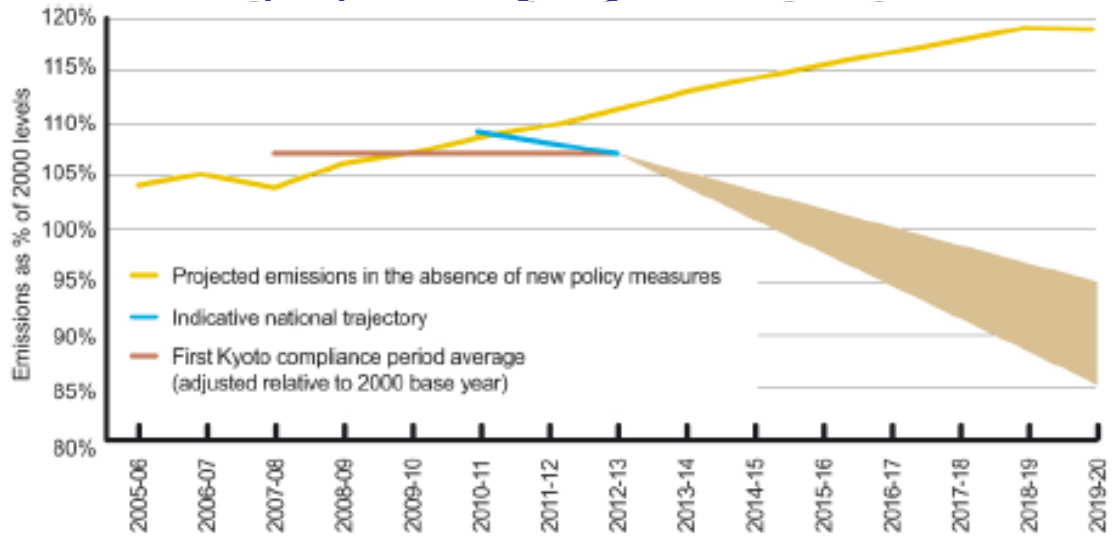


Chart 4. Options for reducing emissions in a market context: the Australian debate

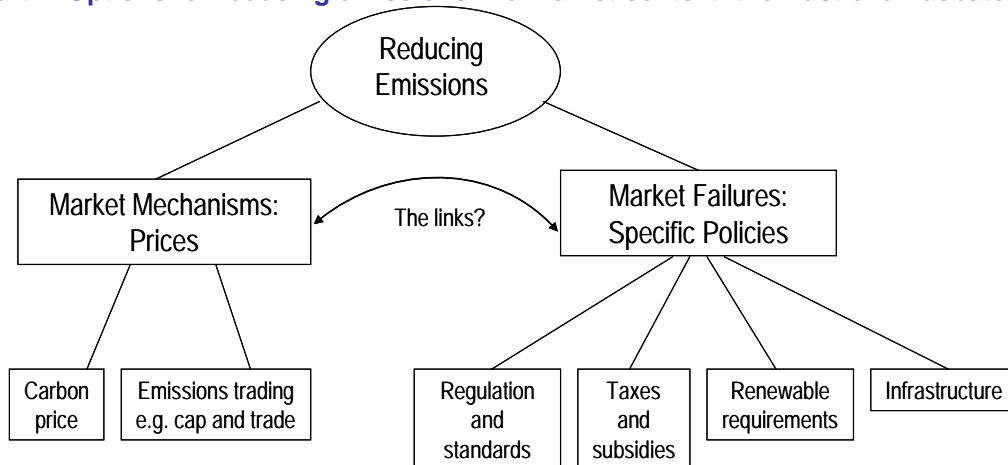


Chart 5. Industrial sector emissions for Australia, CPRS-5 scenario, 2005-2050

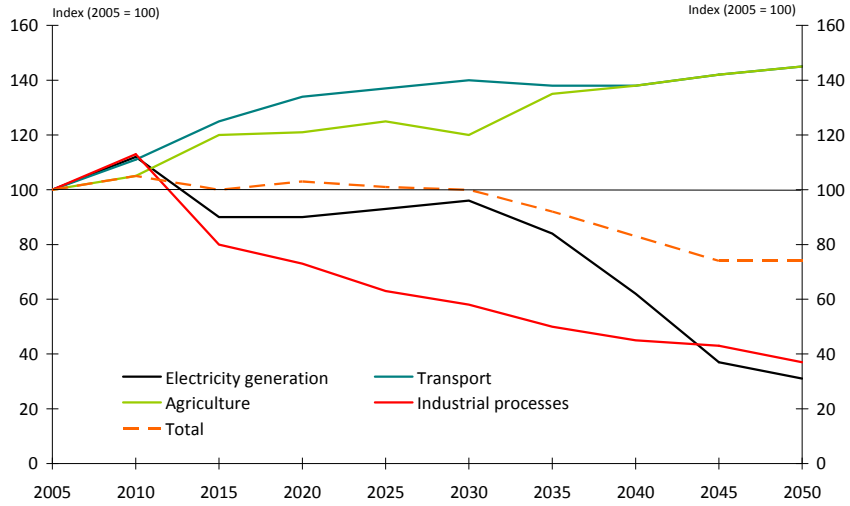


Chart 6. Modal share, Australian passenger travel (proportion of passenger kms), urban passenger travel

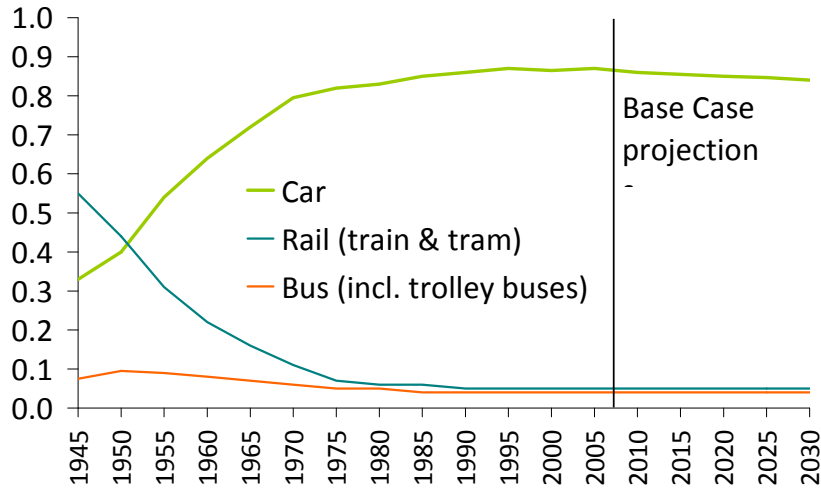


Chart 7. Modal share, Australian domestic freight, Non-bulk mode share proportion

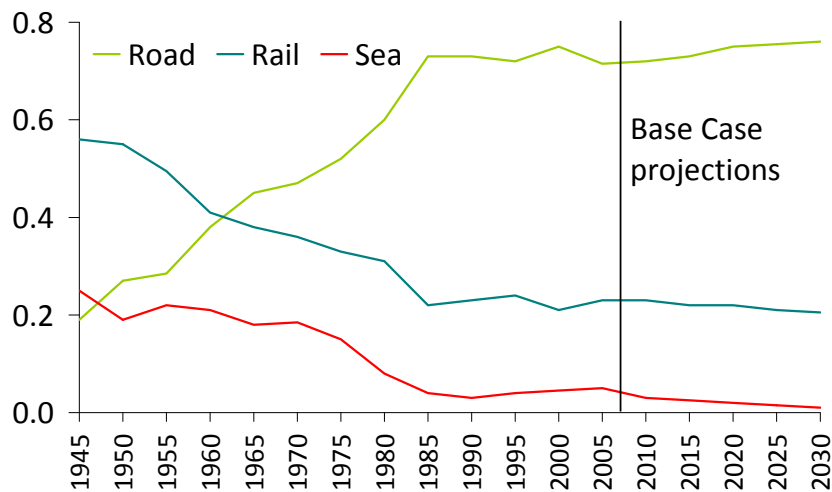


Chart 8. Social costs of freight transport travel (A\$/1000 tonne km)

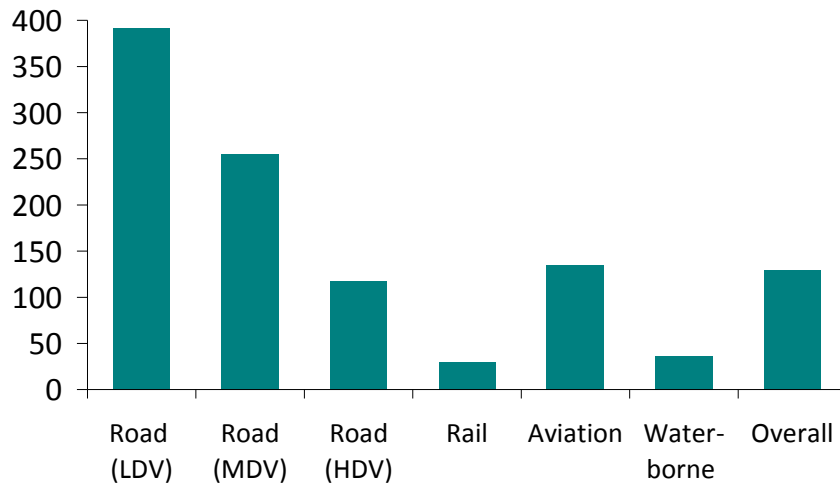


Chart 9. Social costs of passenger transport travel (A\$/1000 tonne km)

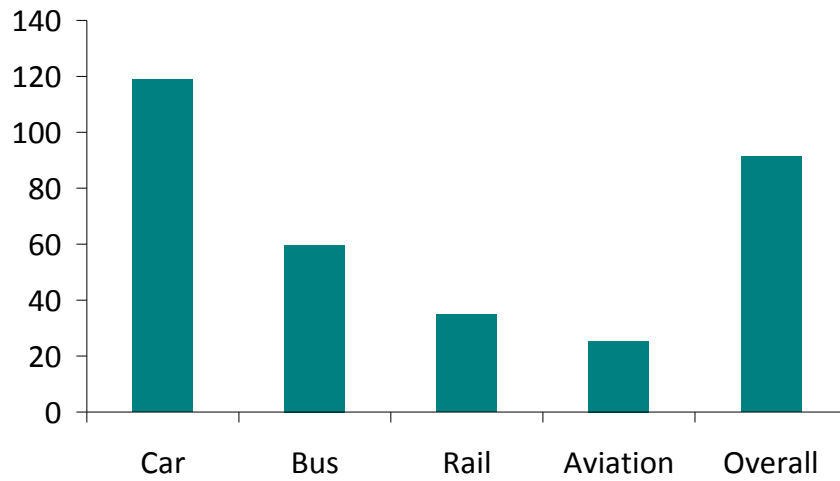


Chart 10. Total transport emissions to 2030, base case, scenario 3 and increased fuel efficiency in road and air transport (Gg CO<sub>2</sub>-e)

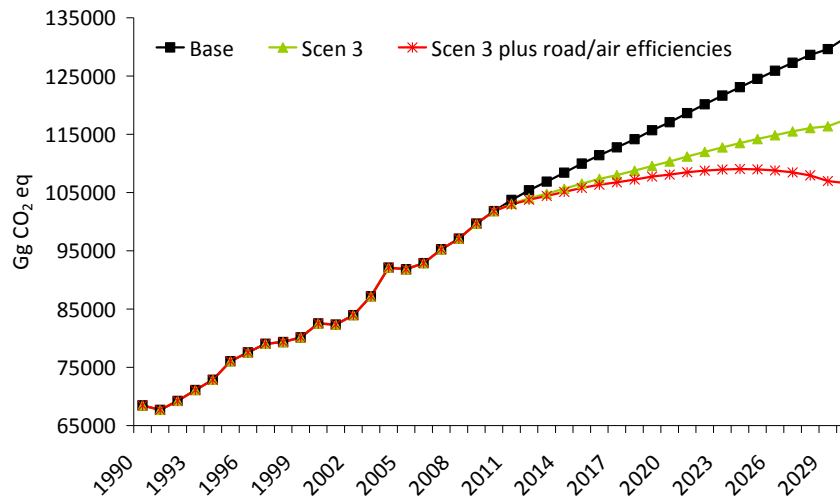


Chart 11. Share of permits allocated to the EITE sector, for different growth rates (per cent)

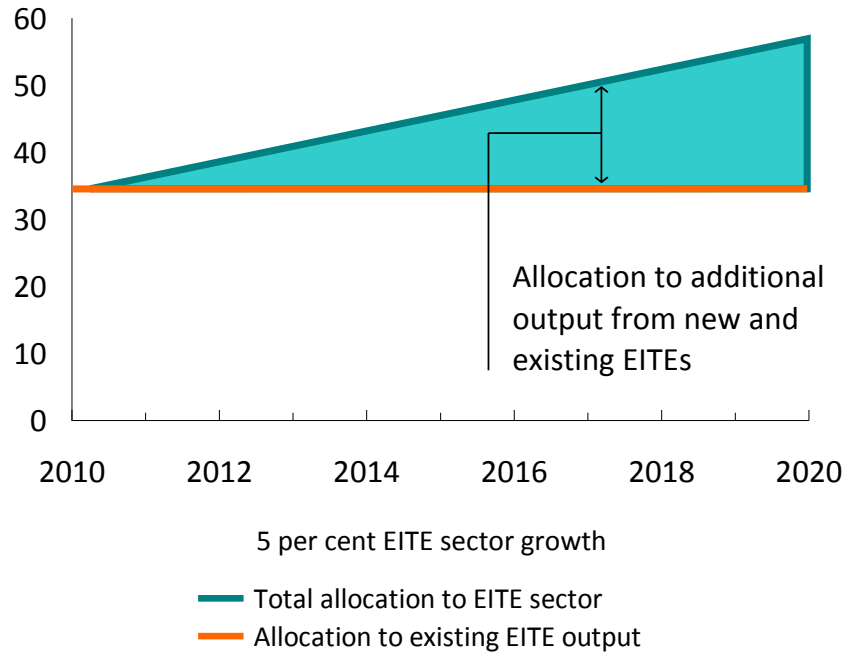


Table 1. Implied change in emissions allocations for non-EITE industries, 2010-20, for given emissions reduction targets and EITE industry growth rates (per cent)

Growth rate of EITE industries	5% reduction target		15% reduction target	
	3%	5%	3%	5%
Change in allocation in 2020 relative to 2010 (%)				
Total allocation	-12.8	-12.8	-22.0	-22.0
Free permits for EITE industries	18.1	43.2	18.1	43.2
Allocation for other industries	-29.4	-42.9	-43.5	-57.0