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AUSTRALIA'S EMISSIONS BUDGET TO 2050

A long-term national emissions budget sets a critical constraint on Australia's emissions. It provides a simple measure of the extent to which Australia is acting consistently with the global below 2 degree goal and highlights the trade-offs between short- and long-term action. A long-term budget should be reviewed periodically to ensure it remains appropriate in light of improved information about climate science, international action and economics.

The Authority proposes a 'modified contraction and convergence' approach to calculating Australia's fair share of the global emissions budget. The approach is equitable and feasible. It involves a gradual convergence to equal-per-person emissions rights in the future. As a share of the global emissions budget, this implies a national budget of 10.1 Gt CO₂-e for the period 2013 to 2050. This is about 17 years of emissions at current levels and can be met through a mix of domestic and international emissions reductions.

Chapter 8 takes the global emissions budget adopted in Chapter 3 as its starting point, and considers how to share this and derive a long-term national emissions budget for Australia.

8.1 APPROACH TO DETERMINING AUSTRALIA'S SHARE

8.1.1 DEFINING GLOBAL AND AUSTRALIAN LIMITS ON EMISSIONS

Limiting global warming to below 2 degrees implies a firm constraint on global emissions. As discussed in Chapter 3, the Authority has adopted a global emissions budget that is estimated to provide at least a likely chance of limiting warming to below 2 degrees. This global budget of 1,700 Gt CO₂-e for the period 2000-2050 provides a starting point for considering Australia's national emissions budget to 2050.

As discussed in Chapter 7, a long-term national budget provides an important reference point for choosing short- and medium-term emissions reduction goals. If these goals were adopted without considering the long-term constraint, Australia might emit so much in the near term that it would have no budget left for later.

Deciding how much of the global emissions budget Australia should allocate itself involves thinking about what constitutes an equitable and fair share, and is necessarily a matter of judgment. The Authority has considered a range of approaches in coming to its recommendation. These approaches are informed by projections of emissions, economics and other parameters such as population growth. Given the uncertainty in these projections, the Authority recommends the budget to 2050 be reviewed every five years along with the medium-term trajectory range. As discussed in Section 3.3, the global emissions budget can also be reviewed on this timetable.

The Authority has also assessed whether adopting the national budget implied by a particular approach would help Australia play a constructive role internationally. There is no international process that assigns national targets. Rather, countries assess their own national interest, and take domestic actions and make international commitments accordingly. That said, it is clearly in Australia's interest to persuade and encourage other nations to strengthen their contributions to international action. Australia is likely to be more persuasive and encouraging if its own goals are viewed as a fair contribution by others. Similarly, Australia is likely to be more persuasive if it adopts an approach that would strengthen global efforts if it were adopted by other nations.

8.1.2 NET GOALS

The Authority's recommended emissions reduction goals for Australia, including the budget to 2050, are net of trade. They represent Australia's responsible contribution to global emissions reduction efforts but do not prescribe where those reductions need to occur. This is consistent with the Authority's recommendation on the use of international emissions reductions (see Chapter 12), accounting rules under the Kyoto Protocol (see Chapter 7) and likely accounting under future international agreements for the period after 2020.

8.2 ASSESSMENT OF AUSTRALIA'S FAIR SHARE

There are many different ways to assess the fair contribution of one country to global efforts. The Authority has considered a range of approaches:

- contraction and convergence
- modified contraction and convergence
- common but differentiated convergence
- immediate convergence
- equal proportional emissions reduction costs
- greenhouse development rights.

Of the methodologies assessed, the Authority considers that modified contraction and convergence provides a budget for Australia that is both equitable and feasible, with countries converging to equal-per-person emissions rights in 2050. The different approaches are discussed in more detail in Appendix C.

8.2.1 SOME APPROACHES ARE NOT FEASIBLE FOR AUSTRALIA

Some approaches imply very small national budgets and therefore unrealistically rapid emissions reductions for Australia. This includes immediate convergence (which implies a 2020 target of more than 70 per cent below 2000 levels) and greenhouse development rights (which implies a 2020 target of more than 55 per cent below 2000 levels). Both received some support in submissions. The desirability and feasibility of very deep near-term cuts depends in part on how much of Australia's emissions reductions can be sourced internationally. If there is a strong desire to undertake a large share of emissions reductions within Australia, then near-term reductions of this magnitude are probably infeasible.

Approaches such as greenhouse development rights rely on developing a long-term 'business-as-usual' trajectory to calculate national targets. These approaches create important practical problems—as more countries take more action, business-as-usual becomes increasingly abstract and difficult to estimate.

8.2.2 FOCUSING SOLELY ON EQUALISING COSTS HAS CONCEPTUAL AND PRACTICAL PROBLEMS

Several stakeholders said that Australia's goals should be based on costs of emissions reductions. For example, the Australian Industry Greenhouse Network stated that the Authority should focus on the 'economic burden of making emissions reductions, since such a metric more closely reflects the working reality that Australia must operate within in international negotiations' (*Draft Report submission*, p. 6).

Cost is an important consideration in setting goals and the Authority has carefully examined the cost implications of its recommended goals in Chapter 10. However, as an approach to deriving Australia's fair share of global climate action, cost-based approaches have three important conceptual and practical limitations.

First, costs are only one aspect of Australia's fair contribution to global action. Australia's capacity, responsibility and exposure to climate change are also relevant considerations. By international standards, Australia is a wealthy nation with high per person emissions relative to other countries. It is therefore fair that Australia takes on some additional costs—particularly relative to developing countries.

Second, the costs of emissions reductions—and their distribution across households and industry—depend heavily on policy design. As Chapter 10 shows, Australia can achieve strong targets at modest cost. Policies can be designed to assist households with increased costs and to moderate the impact on businesses. If countries choose to pursue more costly policies, it should not follow that their fair share of the global emissions budget increases.

Third, cost-based approaches rely on economic modelling, which is not well suited to determining the long-term equitable contribution of countries to the global emissions reduction task. While economic modelling is the best tool available for estimating costs over the short term, projections necessarily become more speculative further into the future. This is because of the wide range of assumptions embedded within models, including industrial composition, technology development and policy design across the world. This suggests that it would be difficult to identify national emissions budgets that equalised proportional costs across countries. Further, the results could be contested rather than useful, as countries would have a perverse incentive to inflate their estimated costs. These points were made by Macintosh (2013, p. 17), who concluded that economic modelling is 'too unreliable, too subjective and too vulnerable to manipulation to provide a reliable and objective basis' to set goals.

The Authority therefore considers that the costs of emissions reductions—by themselves—are not an appropriate way to determine Australia's fair share of the global emissions budget.

8.2.3 A BUDGET BASED ON EVENTUAL CONVERGENCE TO EQUAL-PER-PERSON EMISSIONS RIGHTS IS DESIRABLE

On balance, the Authority's view is that eventual equality in per person emissions rights is fair. This approach has received quite widespread support in Australia and among the international community, and was recommended by the 2008 Garnaut Review. Many of the submissions that discussed budget-sharing also expressed support for equal-per-person emissions.

Still, there are some notable criticisms of equal-per-person emissions approaches:

- **Perverse incentives for population growth**—some suggest that allocating national rights based on population size may make countries increase their populations to gain a larger allocation.
- **Inaccurate population projections**—errors in country level population projections 40 or 50 years ahead can be quite large.

The Authority does not find these criticisms convincing.

Regarding population growth, while national allocations increase one-for-one with population, staying within a larger budget with more people is unlikely to be much easier than staying within a smaller budget with fewer people. Moreover, emissions rights are very unlikely to be a major influence on a country's population and immigration policy.

On the accuracy of future population projections, periodic review of longer term goals can include revisions to take account of new population projections. The Authority recommends this be incorporated in the periodic review of Australia's post-2020 goals (see Chapter 7).

Two further criticisms warrant closer inspection—that equality in per person emissions:

- **Does not explicitly consider historical responsibility**—approaches that achieve equality in emissions per person start from the status quo and, as such, do not take responsibility for previous emissions into account when determining emissions reduction goals.
- **Is unfair**—allocating one good (emissions rights) without taking account of peoples' other goods or characteristics (such as income) may be unfair (Stern 2012). A more conventional public economics approach would generally result in a larger allocation to lower income nations and smaller allocations for wealthy nations like Australia.

The Authority's view is that distant past emissions should not determine a country's fair share of the future global budget—those emissions occurred when their harmful effects could not be foreseen. While the modified contraction and convergence approach does not directly account for historical emissions, it does place extra responsibilities on developed countries with high per person emissions. These countries reduce their emissions more rapidly to provide the headroom for rapidly industrialising countries.

The modified contraction and convergence approach also goes some way to dealing with the second criticism, by taking countries' level of development as well as current emissions per person into account. More broadly, the Authority is inclined to agree with Stern's suggested way forward on this issue. His approach sees rich countries fostering a transition to a low-carbon economy, both at home to drive growth and in the developing world to reduce poverty (2012, pp. 101–2).

It is in that spirit that the Authority reiterates that equity on climate change has implications beyond Australia's emissions reduction goals. Australia provides support for mitigation and adaptation to developing countries through its overseas development program; it could enhance this contribution if desired.

8.2.4 MODIFIED CONTRACTION AND CONVERGENCE PROVIDES AN EQUITABLE AND FEASIBLE BUDGET

Of the equal-per-person approaches, the Authority finds that modified contraction and convergence is the most equitable and feasible.

Under simple contraction and convergence, emissions rights per person contract over time in countries above the global average, and rise over time in countries below the global average, reaching a convergence level of equal-per-person rights in a specified future year. This implies too great a burden on developing countries. It implies, for example, that China's per person emissions rights would need to fall immediately. A common but differentiated convergence approach also implies very demanding emissions reduction goals for high-emitting developing countries (see Appendix C).

In contrast, modified contraction and convergence improves equity outcomes through two modifications—fast-growing developing countries are allowed extra room to increase their emissions, and developed countries reduce emissions more quickly to provide this 'headroom' (Garnaut 2008). This is fairer than both simple contraction and convergence, and common but differentiated convergence. By allowing all countries to transition from their current position, rather than move immediately to equal rights, this approach implies strong but manageable emissions reductions for developed countries like Australia. By providing headroom rather than requiring immediate reductions, it also allows rapidly growing developing countries somewhat more time to decarbonise their economic growth. This approach provides the best basis for determining Australia's appropriate share of the global emissions budget, and gives guidance on Australia's other emissions reduction goals.

8.3 AUSTRALIA'S NATIONAL EMISSIONS BUDGET

The Authority's recommended national emissions budget for the period 2013–2050, based on Australia's fair share of the global budget, is 10.1 Gt CO₂-e. To put this in perspective, if current rates of Australian emissions were maintained, and there were no imports or exports of emissions rights, the budget would be exhausted in 17 years.

The budget is derived through a three-step calculation:

1. The 2000–2050 global emissions budget of 1,700 Gt CO₂-e (Chapter 3) is adjusted to remove historical global emissions from 2000–2012 (610 Gt CO₂-e).
2. Projected emissions from international aviation and shipping for 2013–2050 (50 Gt CO₂-e), are removed, as these are not allocated to any individual country (Section 7.3).
3. Australia's share of the resulting 2013–2050 global emissions budget is calculated as its share of emissions under a modified contraction and convergence approach.

Appendix C provides further details.

As discussed above, this budget is a 'net' goal—to the extent that Australia's domestic emissions exceed the budget, they must be offset by genuine emissions reductions purchased from overseas.

The Authority recommends the budget be reviewed on a regular basis, taking into account developments in climate science, international action and economic factors.

RECOMMENDATION

R.4 A national carbon budget for the period 2013–2050 of 10.1 Gt CO₂-e.

