

For the attention of the Secretary  
Senate Standing Committee on Rural and Regional Affairs and Transport  
PO Box 6100  
Parliament House  
Canberra ACT 2600

## Submission to the 2009 Inquiry into the investment of Commonwealth and State funds in public passenger transport infrastructure and services

In response to the Senate Standing Committee on Rural and Regional Affairs and Transport's call for submissions on public transport infrastructure, we would like to offer the following preliminary findings from a forthcoming Centre for Policy Development research paper on transport infrastructure investment. The following pages are drawn from research conducted by CPD fellow James Slezak on the transport infrastructure investment implications of Australia's CO<sub>2</sub> emissions reductions commitments and as such are most relevant to sections 'b' and 'c' of the Inquiry: **'current and historical levels of public investment in private vehicle and public passenger transport services and infrastructure'** and **'an assessment of the benefits of public passenger transport'**.

For further information, please see our forthcoming paper at <http://cpd.org.au/paper/carbon-disconnect> to be released in April 2009.

## CARBON DISCONNECT

### The transport infrastructure implications of Australia's carbon reduction targets

#### Achieving transport carbon targets

To meet its greenhouse reduction targets, Australia must make coordinated wholesale changes to the way it produces energy and transports people and goods. While the introduction of a carbon pollution reduction scheme (CPRS) is expected to prompt green innovation in a range of sectors of the economy, it is highly unlikely that transport emissions will fall to required levels without direct intervention. This is because the nature of Australia's transport system is determined largely by government infrastructure decisions. While market forces and price signals play significant roles, those roles are constrained by the availability of feasible alternatives to today's dominant mode of transport, namely private petrol-burning vehicles.

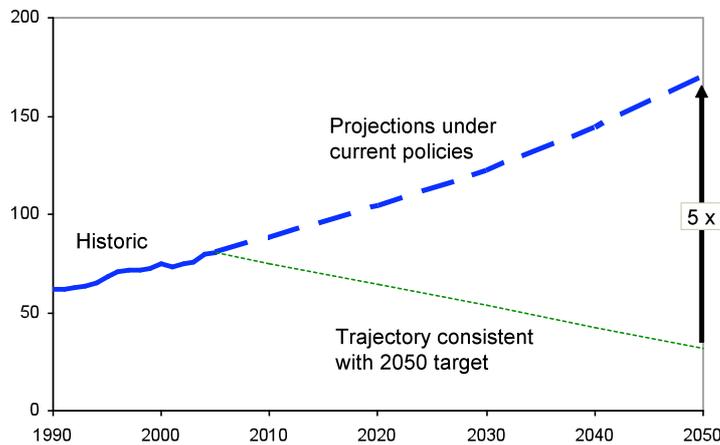
Today, government transport policies at all levels remain wholly disconnected from the imperative to reduce greenhouse gas emissions. Emissions from transport in Australia are projected by the Federal Department of Climate Change to rise to 104 Mt per year by 2020. At projected growth rates, this will rise to 170 Mt by 2050 – over 5 times the level required to meet the government's 2050 reduction target<sup>i</sup>. The impact of all existing government policies aimed at reducing emissions in the sector is officially calculated at a mere 1.8 Mt reduction below business-as-usual levels over the next 10 years, a level that does not come close to halting growth, let alone achieving the steep declines necessary in the sector. Much more must be done if policies on transport and carbon are to become consistent.

The most feasible solutions available to reduce transport emissions, apart from demand reduction<sup>ii</sup>, are an increased use of public transport and a reduced reliance on petrol in private vehicles. While advances in fuel economy will be helpful to slow the growth in private vehicle emissions, the scale of necessary reductions

means that large-scale adoption of electric vehicles will almost certainly be required. So the paths available for Australia to make transport sustainable can be defined broadly according to how much we end up relying on these two levers, that is, public transport and electrification of the private vehicle fleet.

**EXHIBIT 1: Transport sector emissions are projected to rise unsustainably under present government policies**

Mt CO<sub>2</sub>e



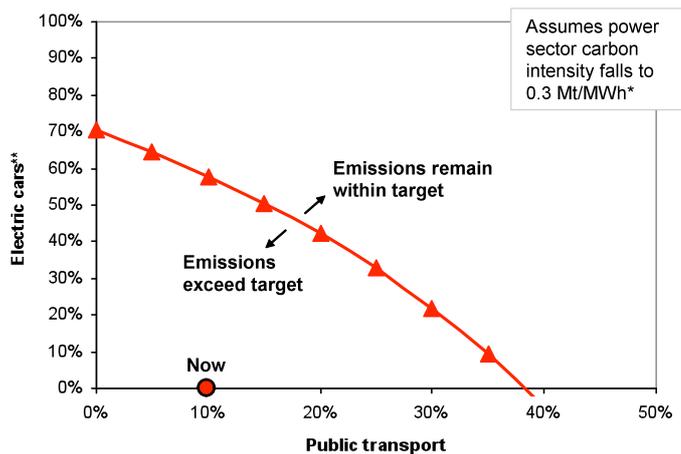
Source: Australian Department of Climate Change (1990 to 2020 figures); CPD analysis (2020 to 2050)

0

**Trade offs between transport modes**

**EXHIBIT 2: A combination of public transport and electric cars is required to meet national greenhouse gas reduction targets**

Combinations of electric car and public transport market share that meet the 2050 target



\* Current intensity is 1 Mt/MWh

\*\* Electric cars include hybrids, which count for a fraction of an electric car (the fraction representing the proportion of electricity to petrol used)

Source: CPD analysis

1

Exhibit 2 gives the preliminary results of ongoing analysis by the Centre for Policy Development, showing the solution space available to policymakers as we implement a sustainable transport sector. Assuming that the emissions of the power sector are reduced to below a third of their present levels (more on this below), the market penetration of electric cars would need to rise to as much as 70% by 2050, or public transport use would need to rise to just under 40%. Alternately, a combination of more moderate levels of both, on the

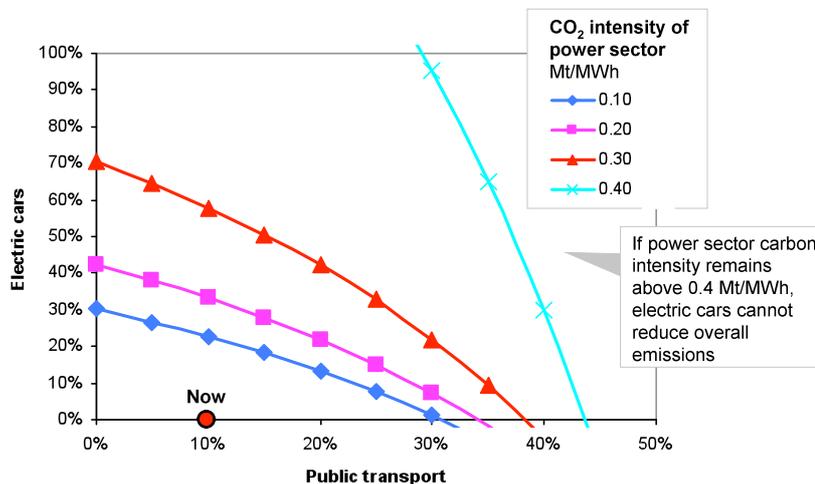
order of 30%, would also work. Combinations of market shares lying along or above the red curve will allow Australia to meet its current emissions reduction commitments.

Under these scenarios, the major driver of reducing emissions is the substitution of electricity for petrol or diesel, which comes about by moving passengers into electric cars and onto trains. (The remainder of the reductions comes from more efficient use of the remaining fossil fuel energy, powering buses and non-electrified trains rather than cars and trucks.) Switching from petrol to electricity is necessary, but not sufficient. If electricity continues to be produced using heavily carbon-intensive technologies, little will be gained.

The curve lines represent the various combinations of transport modes needed to achieve a forecast 300 billion passenger km under a transport emissions cap of 31.7 Million tonnes of CO<sub>2</sub>. At lower levels of carbon efficiency in electricity generation an even greater proportion of either public transport or carbon efficient private transport such as electric vehicles would be needed to meet that target.

**EXHIBIT 3: Reducing transport sector emissions is more difficult if the carbon intensity of the power sector is not also reduced sharply**

Combinations of electric car and public transport market share that meet the 2050 target



Source: CPD analysis

2

The four lines of Exhibit 3 show how the line of possible outcomes in Exhibit 2 evolves as the carbon intensity of the power sector changes. Unless power sector carbon intensities are reduced by well over 50%, electric cars cannot begin to make a contribution to emissions reductions<sup>iii</sup>. If we do not succeed in reducing power sector emissions by this amount, private vehicle use will need to be greatly reduced, even assuming significant gains in fuel efficiency, with the required public transport market penetration approaching 50%, approximately where it was in 1950.

Policy makers should recognise that any of the scenarios outlined will require rapid investment aimed at achieving a large-scale step change in the uptake of public transport, along with subsidies and taxes to promote the rapid adoption of carbon efficient private transport, as well as support for the development of necessary charging infrastructure<sup>iv</sup>.

Author: James Slezak

Contact via the Centre for Policy Development

<sup>i</sup> Assumes transport sector emissions continue to represent 14% of overall national emissions. Since long-term targets are likely to be the product of international agreements, it is worth noting that Australia's 2050 target is significantly weaker than that of the United States and UK; both are committed to an 80% reduction below 1990 levels by 2050, compared to Australia's target of 60% below 2000 levels.

<sup>ii</sup> Demand reduction measures include price signals through increased levies on vehicles and petrol, as well as urban planning improvements.

<sup>iii</sup> Two qualifications should be made here. First, since it will take time to build up the fleet of electric vehicles and to bring power sector emissions down, promoting adoption of these vehicles will be justified even while power sector emissions remain above this level. Second, "green power" schemes can allow consumers to purchase electricity with an effective carbon intensity below the national average rate.

<sup>iv</sup> Project Better Place is one US-based business consortium already aiming to build such infrastructure in Australia