# “Prospects for meeting Australia’s 2020 carbon targets”

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University of Queensland School of Economics Seminar 30 March 2011

http://www.uq.edu.au/economics/documents/seminarpapers/hunt201203.pdf

# Global target

- **To stabilise concentrations of $CO_2e$ at 450 ppm, emissions must be reduced to 25-40% below 1990 levels by 2020, and 80-95% below 1990 levels by 2050 (Metz et al. 2007: Box 13.7, Chapter 13).**

- Limiting the atmospheric concentration of $CO_2e$ to 450 ppm gives a probability of exceeding a 2°C rise in temperature throughout the 21st century of 19-56%, i.e. the probability of staying within 2°C is 'more likely than not' (Meinshausen et al. 2009: Fig S1c).

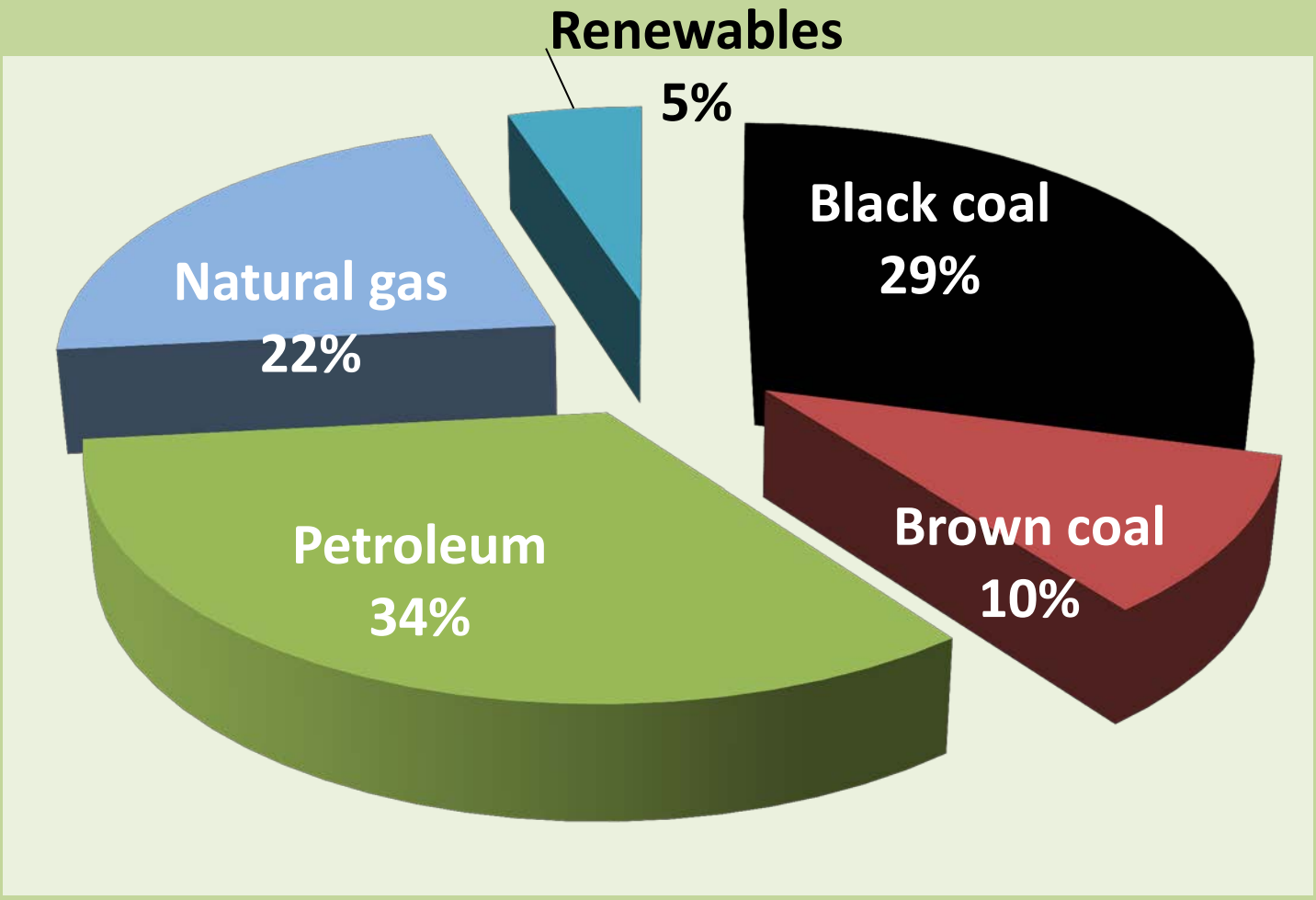
# Australia's cuts in carbon pollution(1)

- **an unconditional commitment of 5% by 2020**;
- 15% by 2020, if major developing economies commit to substantial emission restraints and advanced economies take on commitments comparable to Australia's;
- 25% by 2020, if the world agrees to stabilise levels of $CO_2$ equivalent at 450 ppm or lower (Wong 2010).

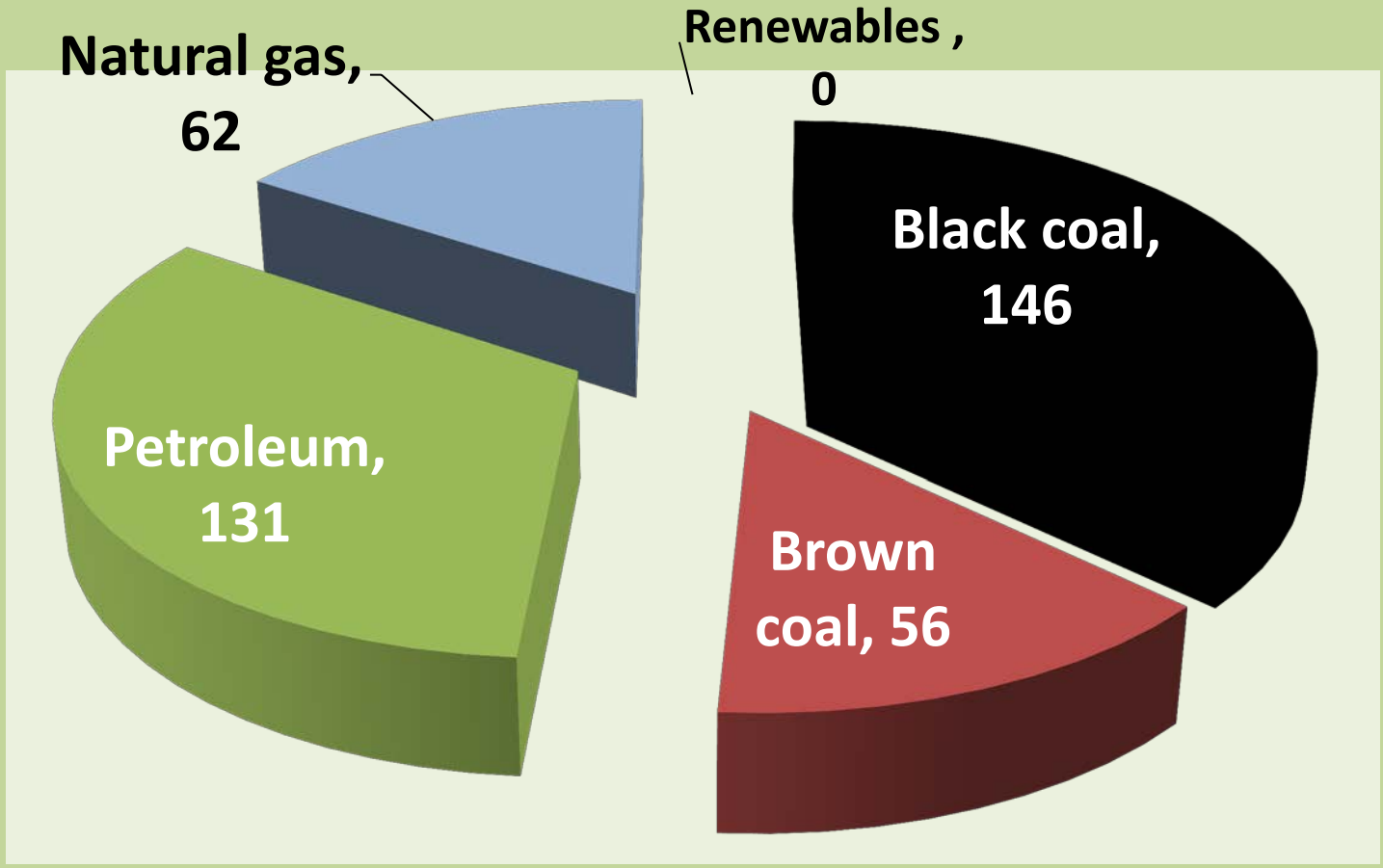
# Australia's cut in carbon pollution (2)

Note that Australia's cut of 5% against 2000 levels by 2020 is actually an ***increase*** above 1990 emissions (excluding LULUCF) ((Hunt (2011) and Levin and Bradley (2010: Table 8))

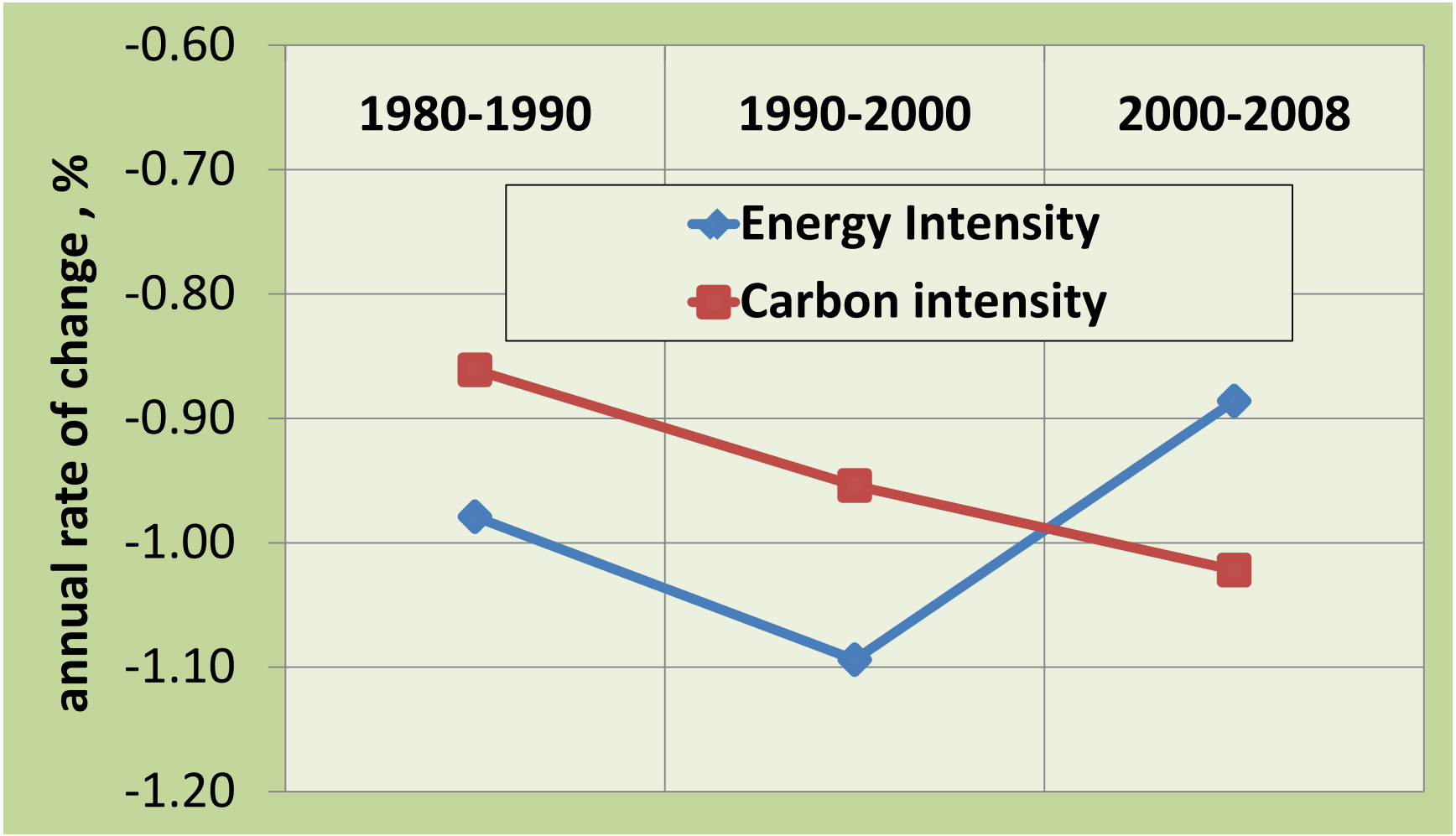
# Sources of energy, Australia



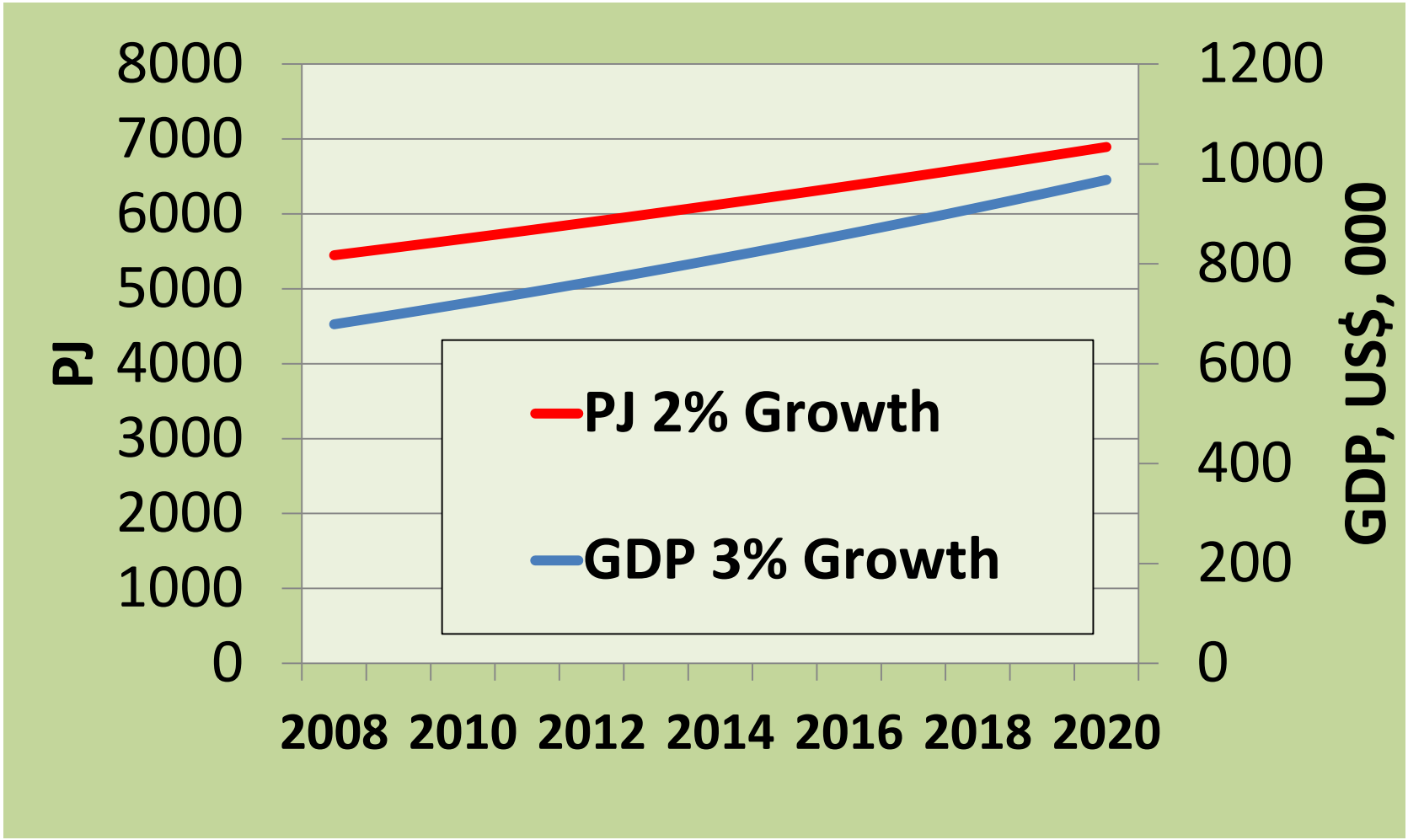
# $CO_2$ emissions by source, Mt



# Rate of change, energy and carbon intensity, Australian economy



# Growth in the Australian economy and in energy consumption



# Mt $CO_2e$, actual and 5% target

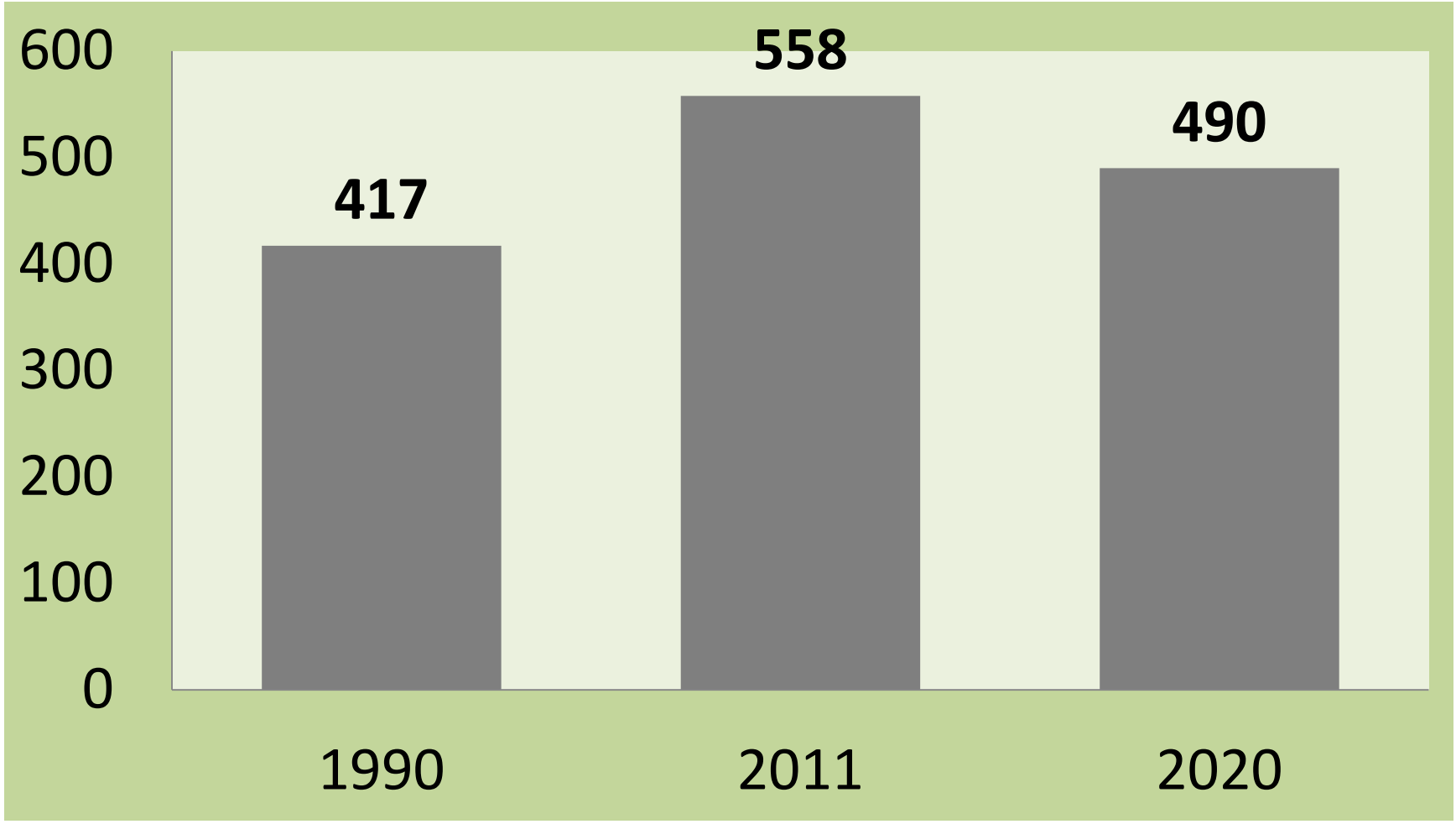
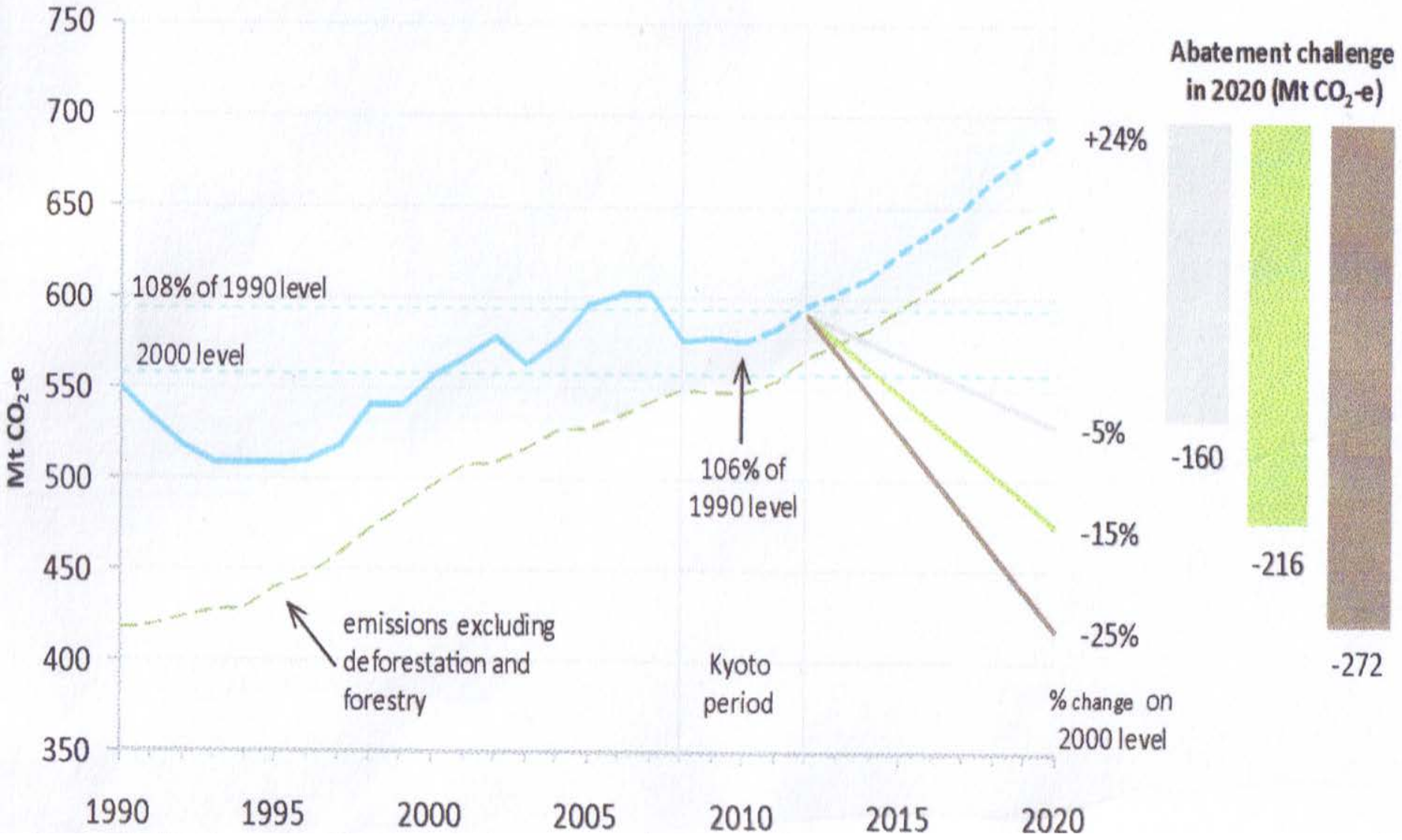
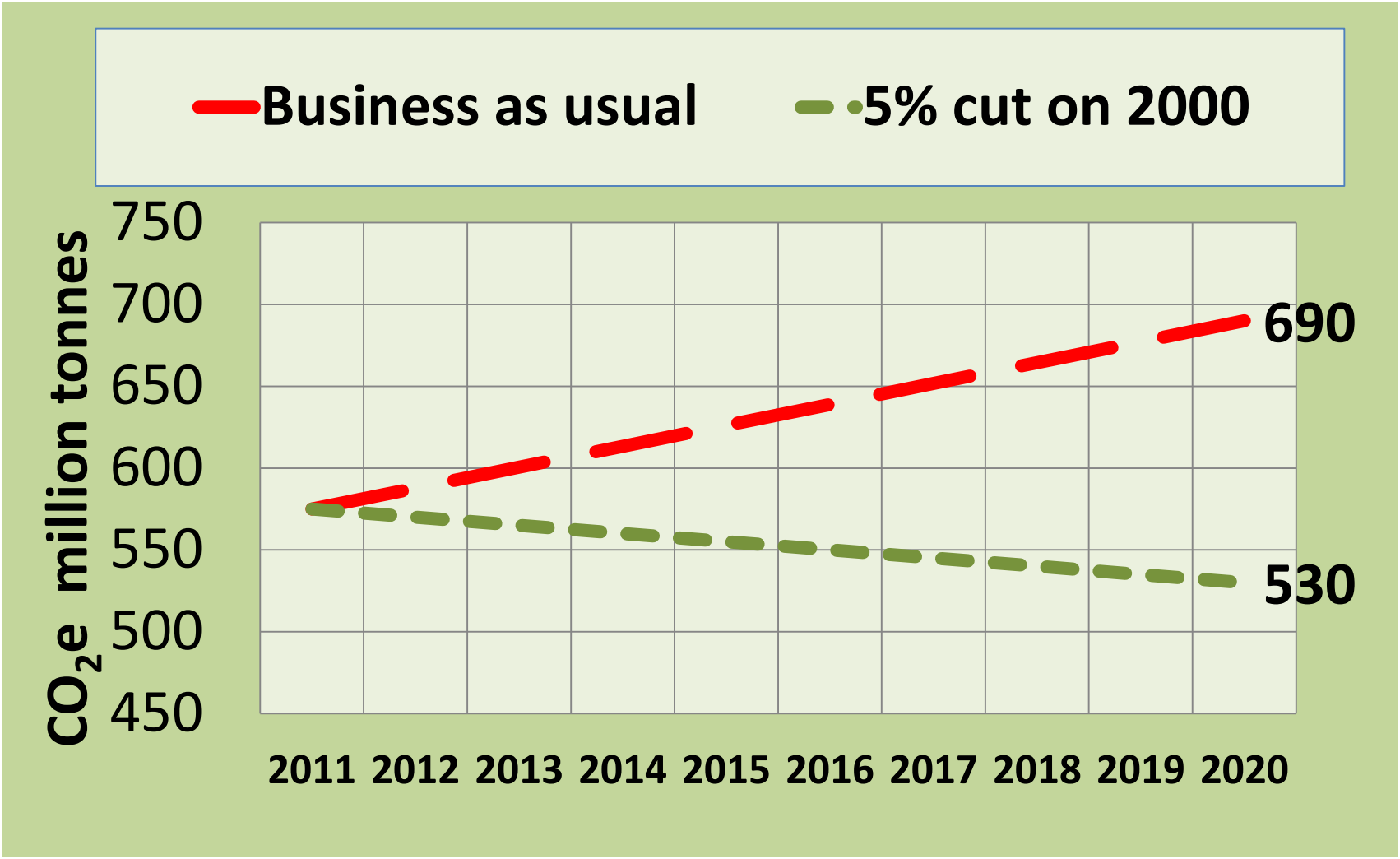


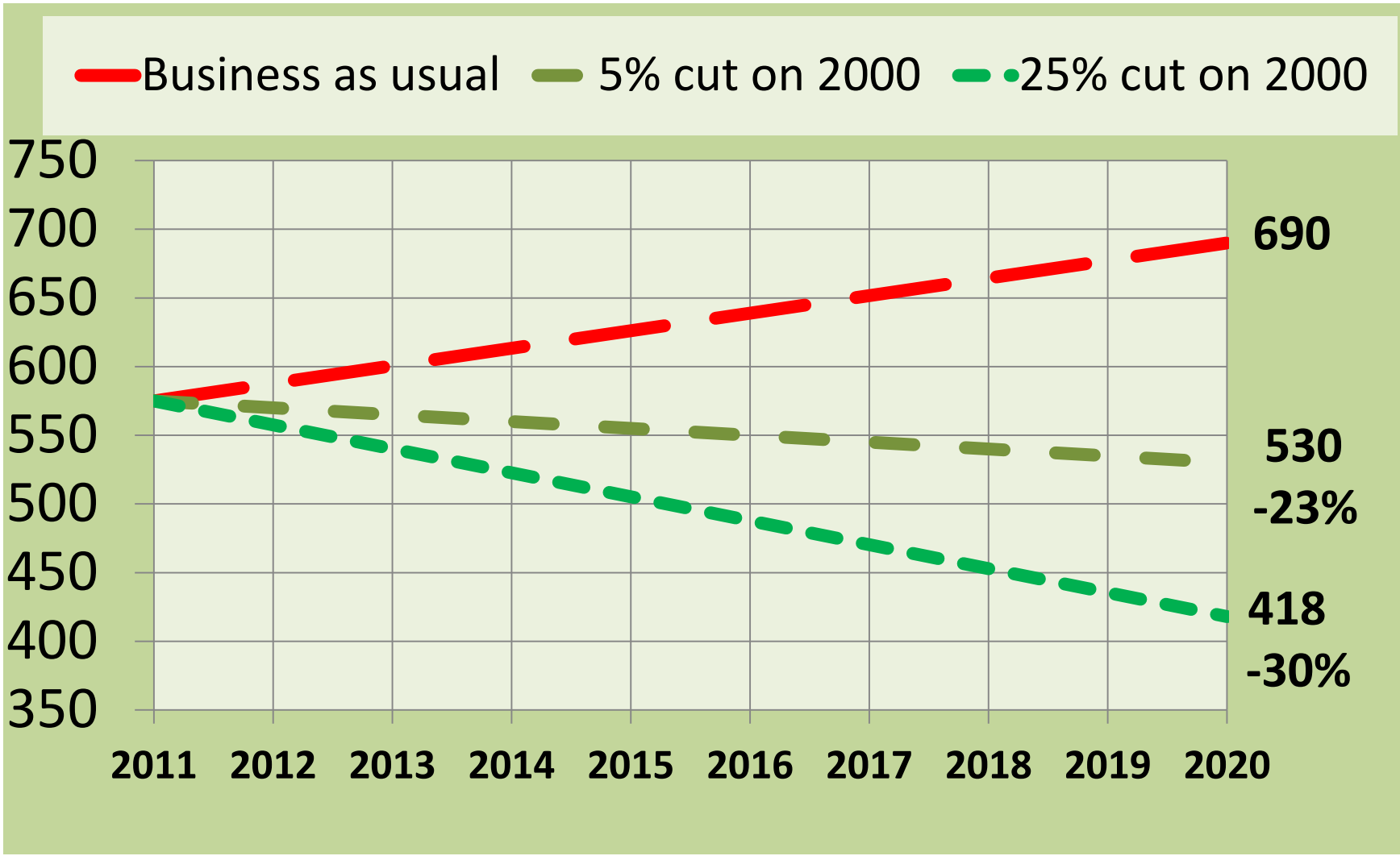
Figure 5 Baseline sector emissions trends, 1990 to 2020



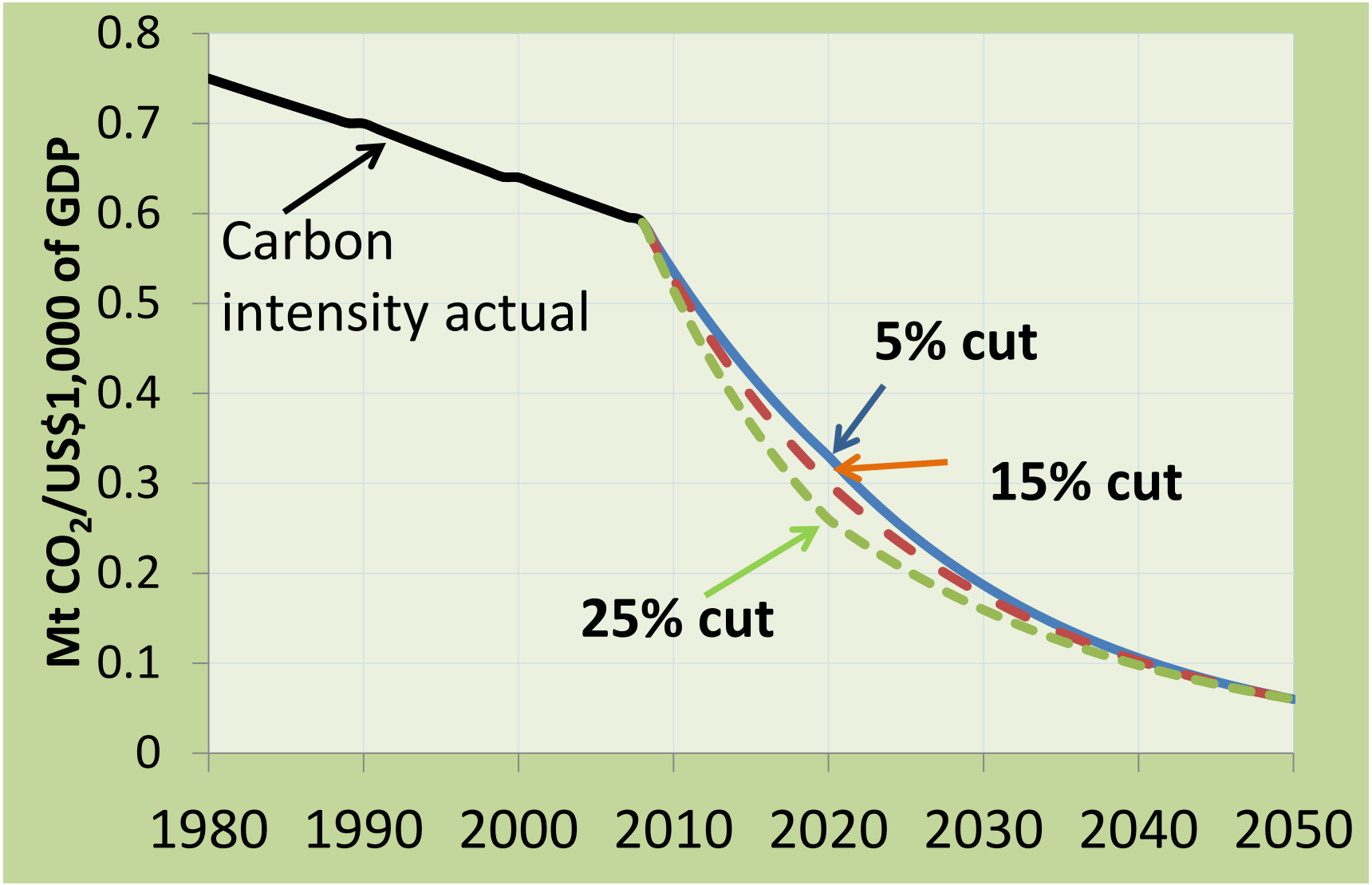
# Australia's carbon emissions: 'business as usual' and 5% cut, $MtCO_2e$



# ‘Business as usual' & 5%, 25% cuts, Mt $CO_2e$



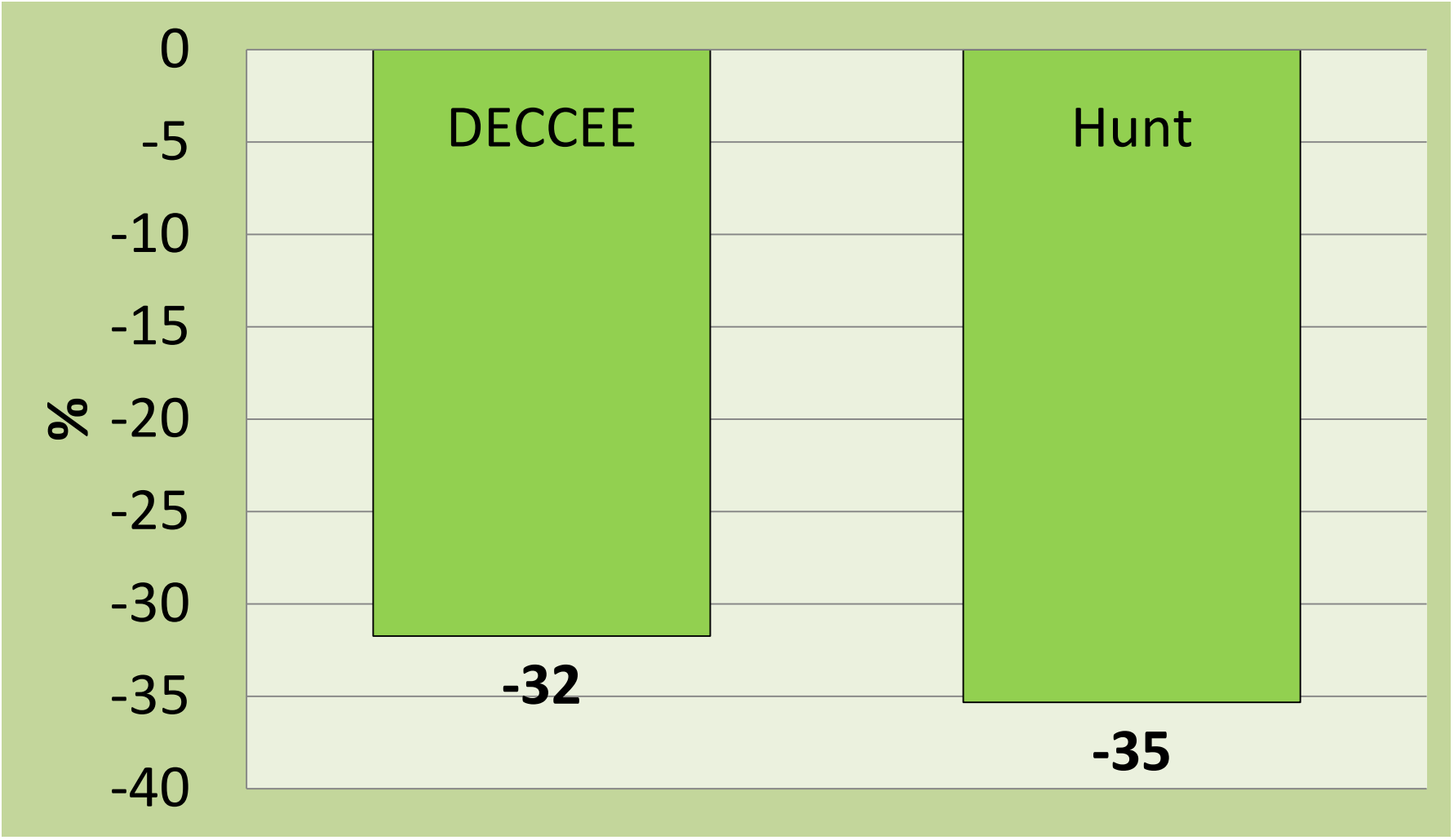
# Carbon intensity of Australian economy



# Annual rates of decarbonisation of Australian economy, 1980 to 2050

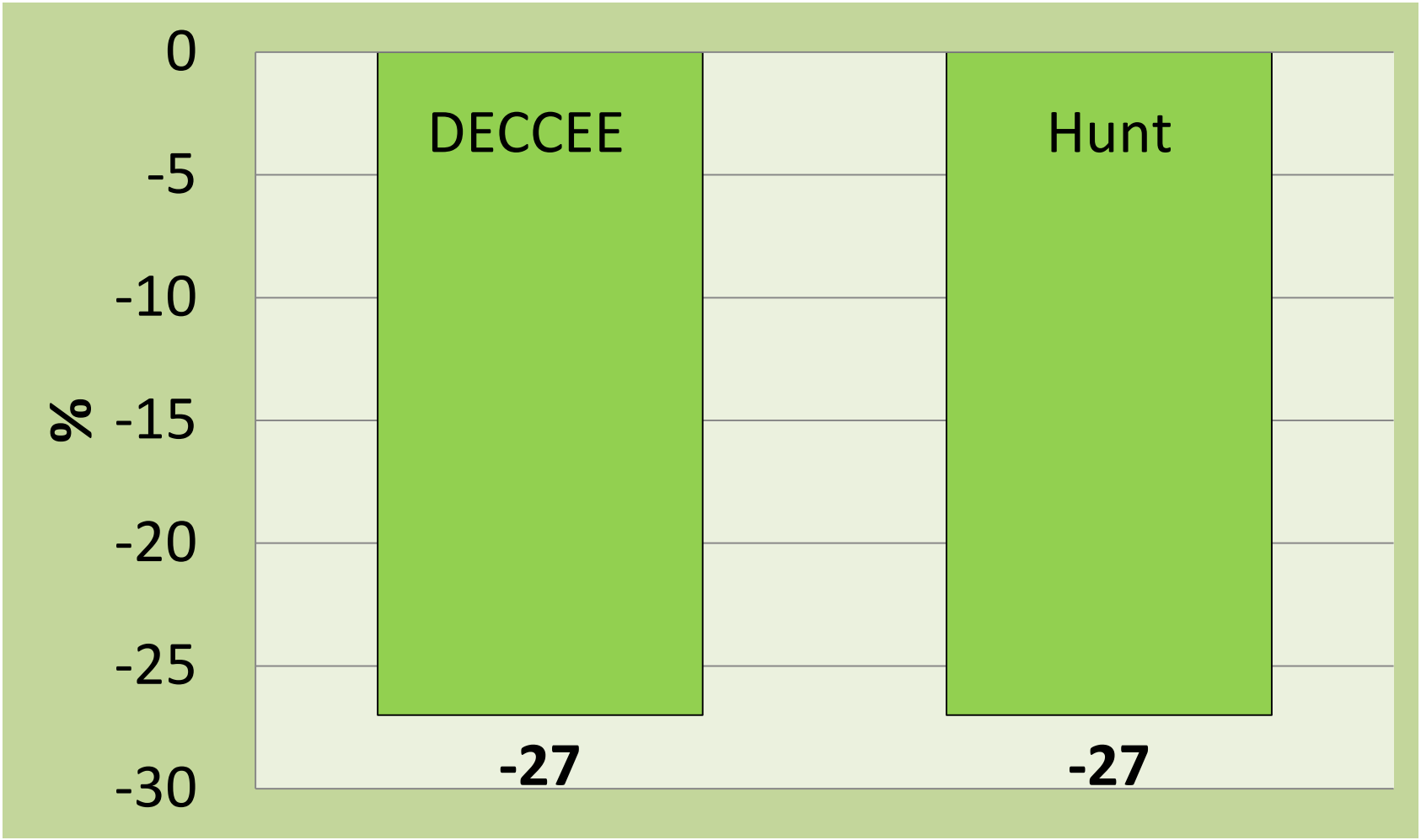
| | 1980-2008 | 1990-2008 | 2000-2008 | 2008-2020 | 2008-2050 |
|---|---|---|---|---|---|
| Actual rate of change | -0.86 | -0.95 | -1.02 | | |
| Implied rate of change | | | | | |
| 5% reduction target | | | | -5 | |
| 15% reduction target | | | | -5.8 | |
| 25% reduction | | | | -7.1 | |
| 60% reduction target | | | | | -5.6 |

# Change in carbon intensity required, 2011-2020



# Change on BAU emissions, 5% cut on 2000 by 2020

(excluding deforestation and forestry)



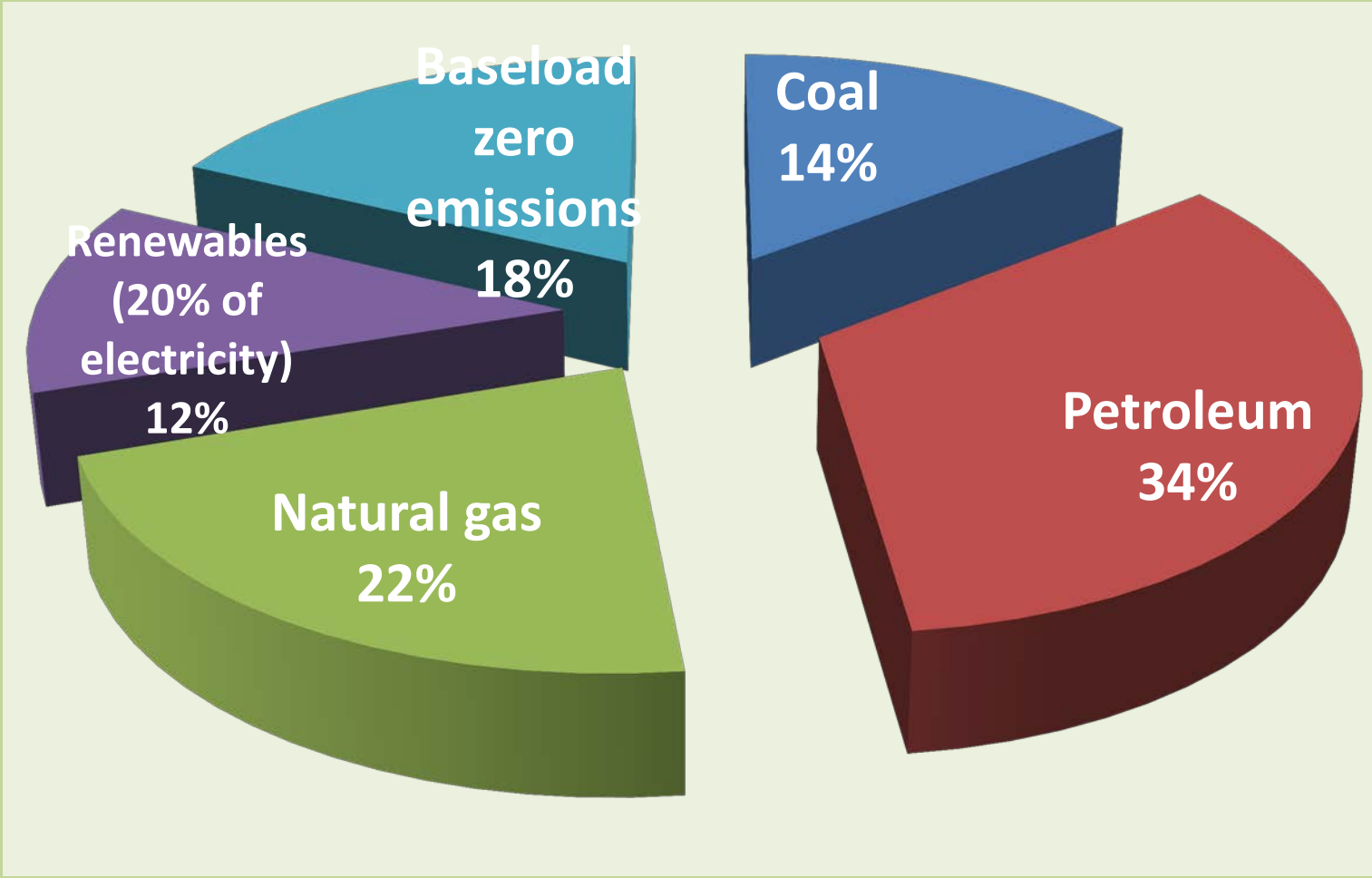
# Energy mix and emissions, Australia, 2008

| | % | 000PJ | $CO_2$t/000PJ | $CO_2$ Mt |
|---|---|---|---|---|
| Black coal | 29.1 | 1,587 | 92.1 | 146.1 |
| Brown coal | 10.6 | 577 | 96.6 | 55.7 |
| **Coal** | **39.7** | **2,163** | **93.3** | **201.8** |
| Petroleum | 33.6 | 1,832 | 71.5 | 131.0 |
| Natural gas | 21.6 | 1,179 | 52.8 | 62.2 |
| Renewables | 5.0 | 274 | 0 | 0 |
| Totals | 100.0 | 5,448 | | 395.1 |

# Energy mix and emissions Australia, 2020, 5% target

| | % | 000PJ | $CO_2$t/000PJ | $CO_2$ Mt |
|---|---|---|---|---|
| **Coal** | **14.5** | **954** | **93.3** | **89** |
| Petroleum | 33.6 | 2,212 | 71.5 | 158 |
| Natural gas | 21.6 | 1,424 | 52.8 | 75 |
| Renewables | 12.4 | 816 | 0 | 0 |
| Other | 17.8 | 1,173 | 0 | 0 |
| Totals | 100.0 | 6,579 | | 322 |
| Targets | | 6,579 | | 322 |

# Sources of energy 2020, 5% target



# But…

why won’t the emissions from transport decrease?

# And…

why can’t we ramp up the use of gas to meet the target?

# What about forestry?

The Carbon Farming Intitiative will surely make a difference?

# Energy mix and emissions 2020, 5% target

| | % | PJs | Mt $CO_2$ |
|---|---|---|---|
| Coal | 14.5 | 954 | 89 |
| Petroleum | 33.6 | 2212 | 158 |
| Natural gas | 21.6 | 1424 | 75 |
| Renewables (20% of electricity) | 12.4 | 816 | |
| **Baseload zero emissions** | **17.8** | **1173** | |
| Totals | 100.0 | 6579 | 322 |

# Average costs of central generation technologies

| | A$/MWh | Permit price needed |
|---|---|---|
| Coal | 32 | |
| Geothermal | 78 | 46 |
| Solar thermal | 140 | 108 |

# Permit price required

| | Average costs A$/MWh | Permit price required |
|---|---|---|
| Coal | 32 | 0 |
| Wind | 70 | 38 |
| **Baseload** | | |
| Geothermal | 78 | 46 |
| Solar thermal | 140 | 108 |

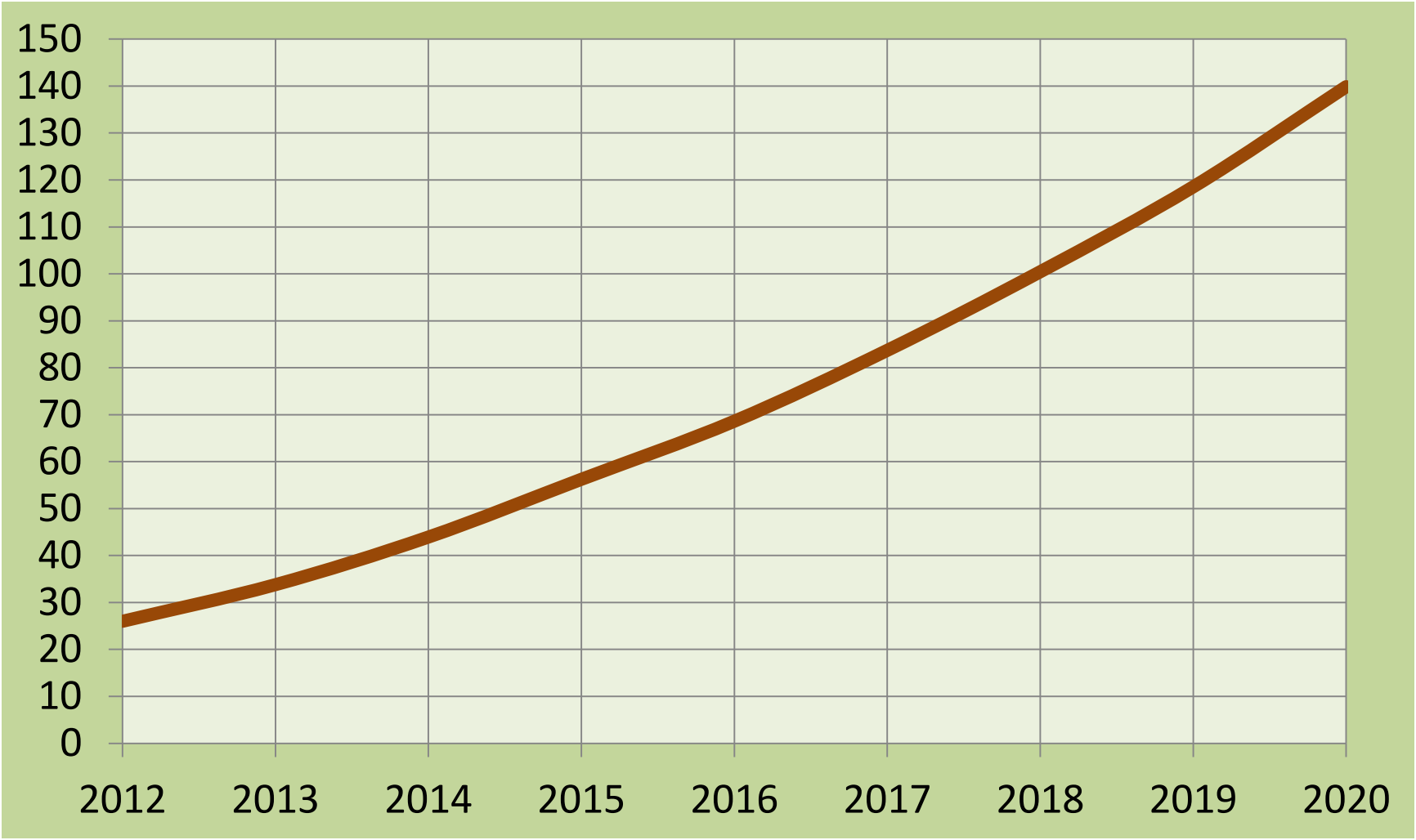
# Quotes on permit price

"To drive the take-up of alternative energy the [carbon] price would have to rise …to more than $50 a tonne" (Switkowski, quoted in *The Australian,* 1 March, 2011, p. 6).

"Any investment decision for a new gas-fired combined cycle gas turbine has to assume…a carbon price of $60-70 a tonne" (Morgan Stanley report, quoted in *The WE Australian*, 12-13 March, 2011, p. 5).

"Renewable energy operators say current energy prices are too low to justify investment in wind farms" (Maher and Hepworth, *The Australian*, 7 March, 2011, p. 2).

# Carbon price increase:
# 30% a year to 2015; 23% average



# The role of international permits (1)

The Garnaut review (Garnaut 2008) and the white paper (Australian Government) both met targets by allowing considerable purchase of permits offshore.

Given the lack of commitments by major polluters to quantifiable cuts the prospects for the formation of a global market are poor.

# The role of international permits (2)

**CERs (equal to one tonne of $CO_2$) availability through the CDM in each year for the period 2012 to 2020 is estimated to be 186 million (Risoe 2011).**

**But Australia alone could be attempting to purchase up to 100 million CERs a year to cover its excess of emissions over 5% target caused by its need for baseload power from fossil fuels (see slide 23).**

# Garnaut on meeting Australia's emission targets

Garnaut, in his recent Climate Change Review Update remarks, on page 16, that "…existing mitigating policies are hopelessly inadequate to meet even the lower end of our 2020 emissions target range".

But he does not test the likelihood of Australia meeting its emission targets, under his suggested carbon pricing regime, in the absence of international credits.

# Conclusions

**Conspiring to put the 5% cut out of reach are:**

- **the cost of renewable energy relative to that derived from coal;**
- **the need for a high percentage of baseload power**
- **consumer behaviour,**
- **and the absence of carbon markets.**

- **the "conditional" cuts of 15% and 25% are completely out of the question.**

# Policy implications

**Australia must:**

- **Retreat from its 5% "unconditional" 2020 cut;**
- **Substitute a realistic target;**
- **Retreat from its conditional targets.**

**Prevarication will compromise the ability of the international community to monitor the effectiveness of collective mitigation pledges to limit climate change.**