



Australian Government
Department of Climate Change

The Economics of Climate Change

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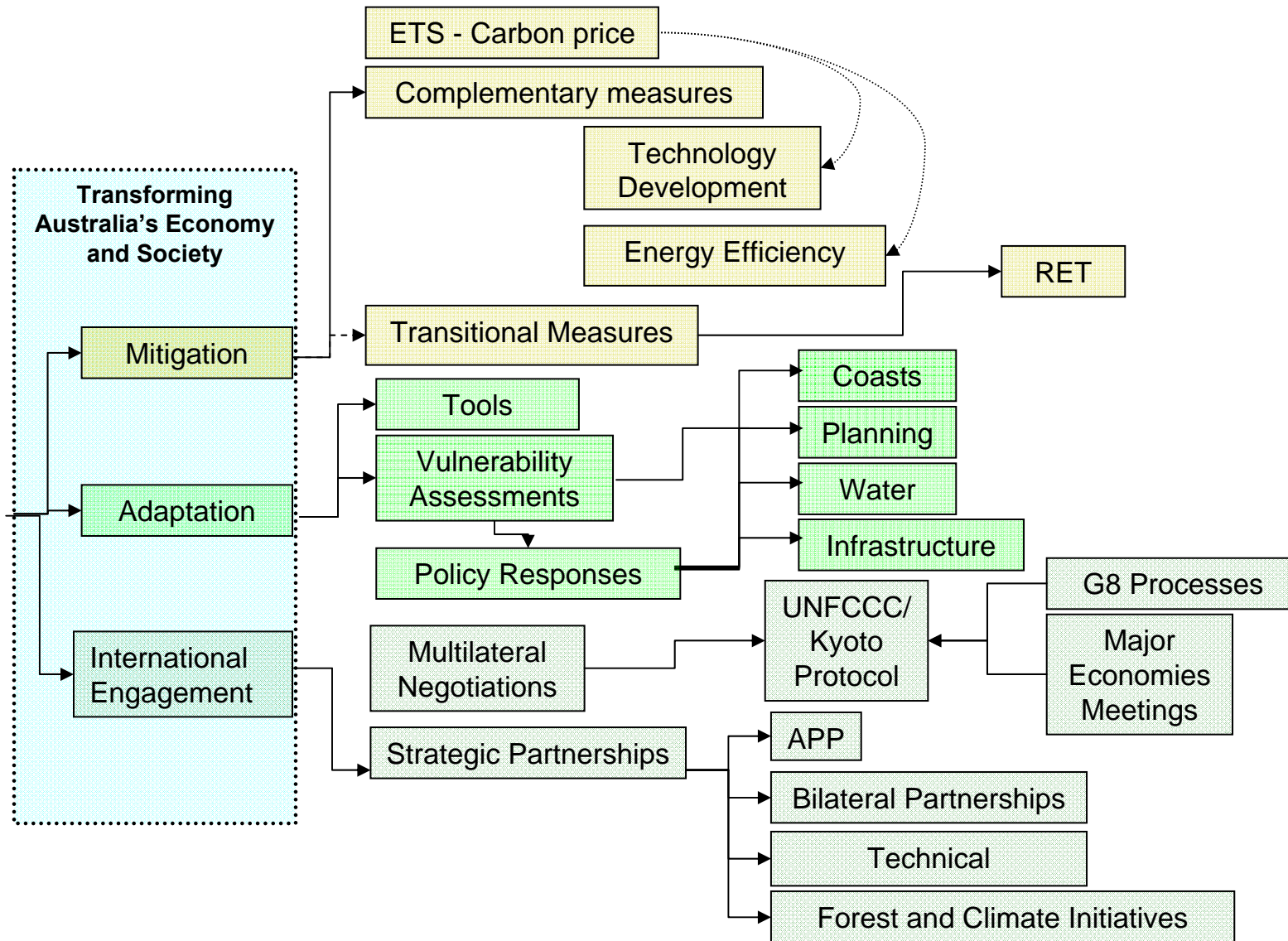




Outline

- Policy context
 - Three pillars
- Economics of International Engagement
- Economics of Mitigation
 - Least cost
 - Emissions trading
 - Complementary Measures

Three Pillars





International engagement

- Climate change is a public bad
 - Non price-excludable
 - Non rivalrous in consumption
- Non-cooperative game
 - Incentive to free-ride
- Need to create a cooperative game
 - Harder the larger the number of participants



Mitigation approaches

- Market mechanisms
 - Cap and trade
 - Offsets
 - Baseline and credit
- Regulation



Cap and trade - emissions trading

- Identify emissions to be covered
- Set the “cap”
- Issue permits
- Monitor compliance
- Permits can be traded



ETS – cap and trade

- The cap achieves the environmental outcome
 - The cap falls over time
- The trade ensures least cost

A company perspective

For Company A, let's say:

- Permits cost \$20 each
- Reducing two tonnes of emissions in the company costs \$15



Cheaper to reduce emissions

- If had permits, would **SELL**
- If had no permits, **AVOID BUYING**

A different company perspective

For Company B, let's say:

- Permits cost \$20 each
- Reducing one tonne of emissions in the company costs \$150

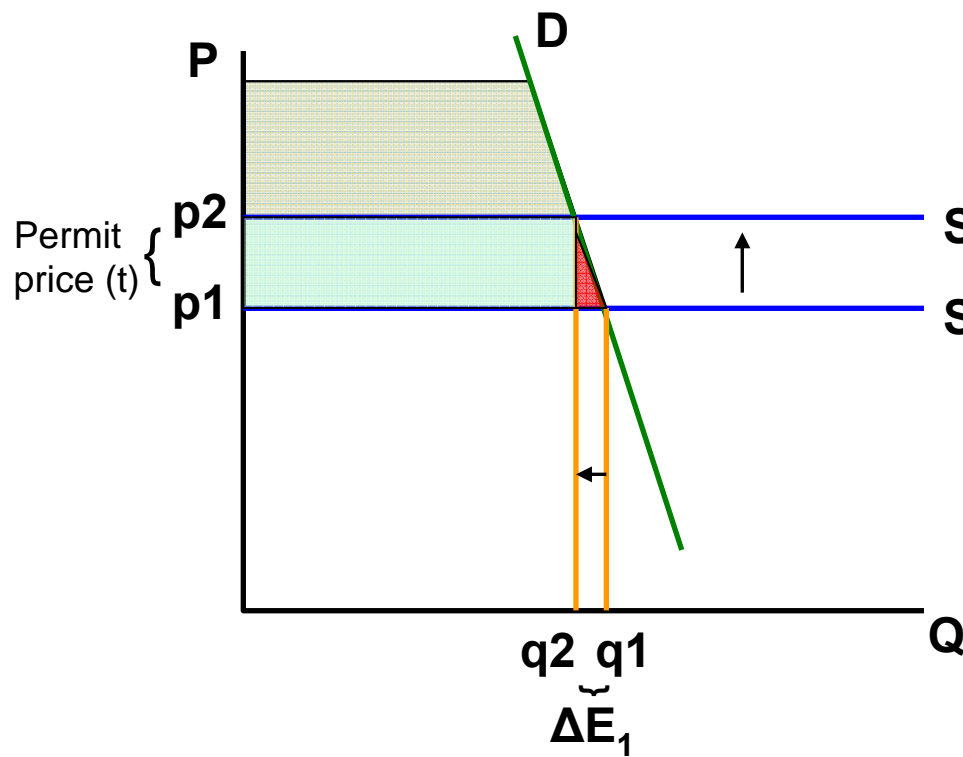


Cheaper to buy permits

- If had permits, would USE
- If had no permits, would BUY

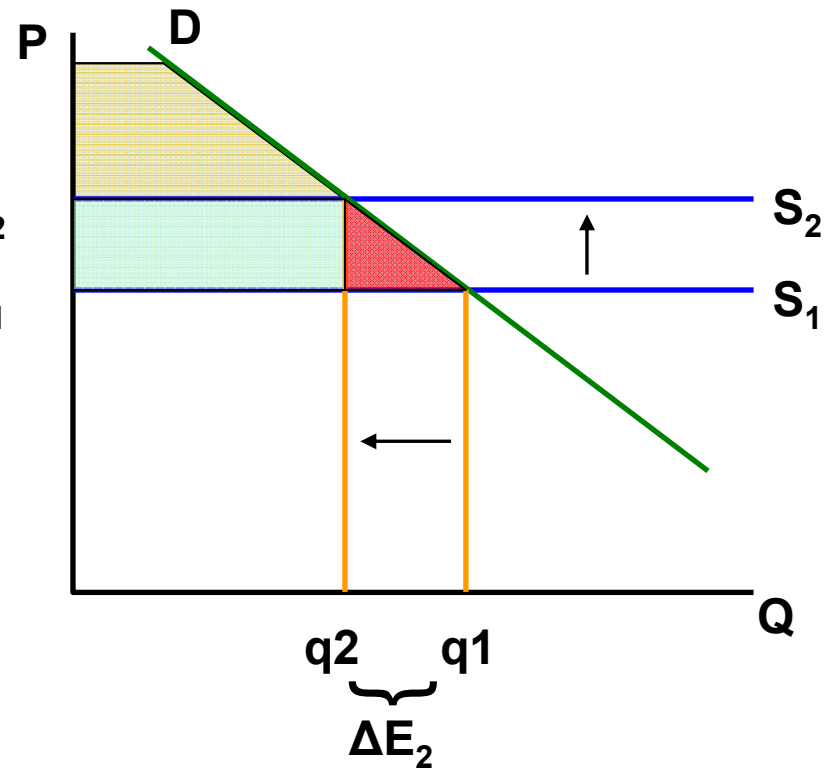
ETS – Least cost abatement

Inelastic good



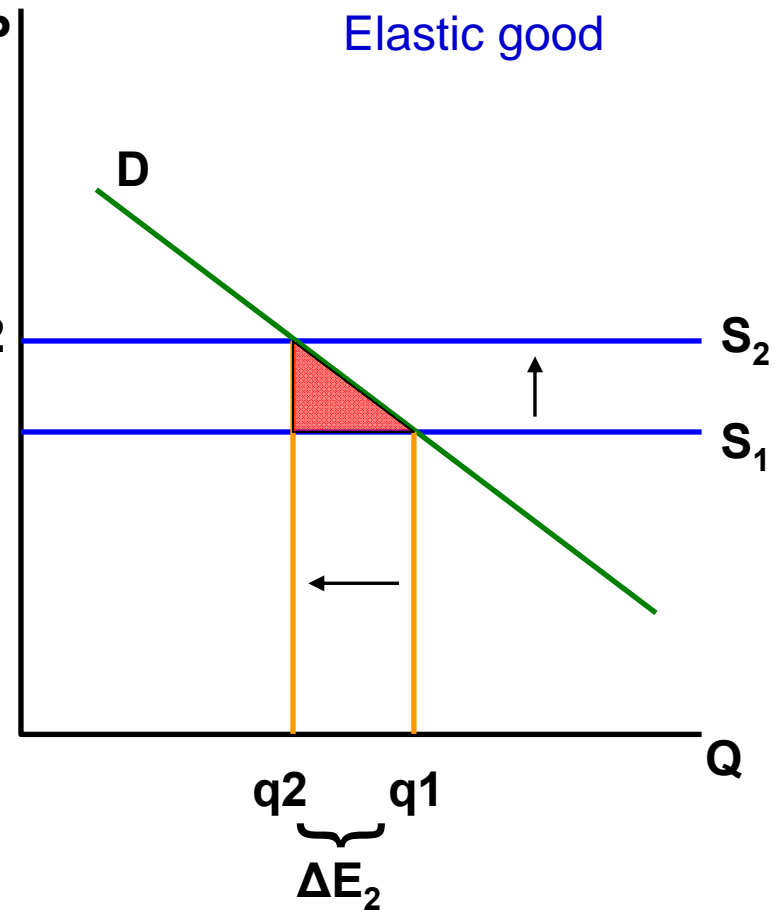
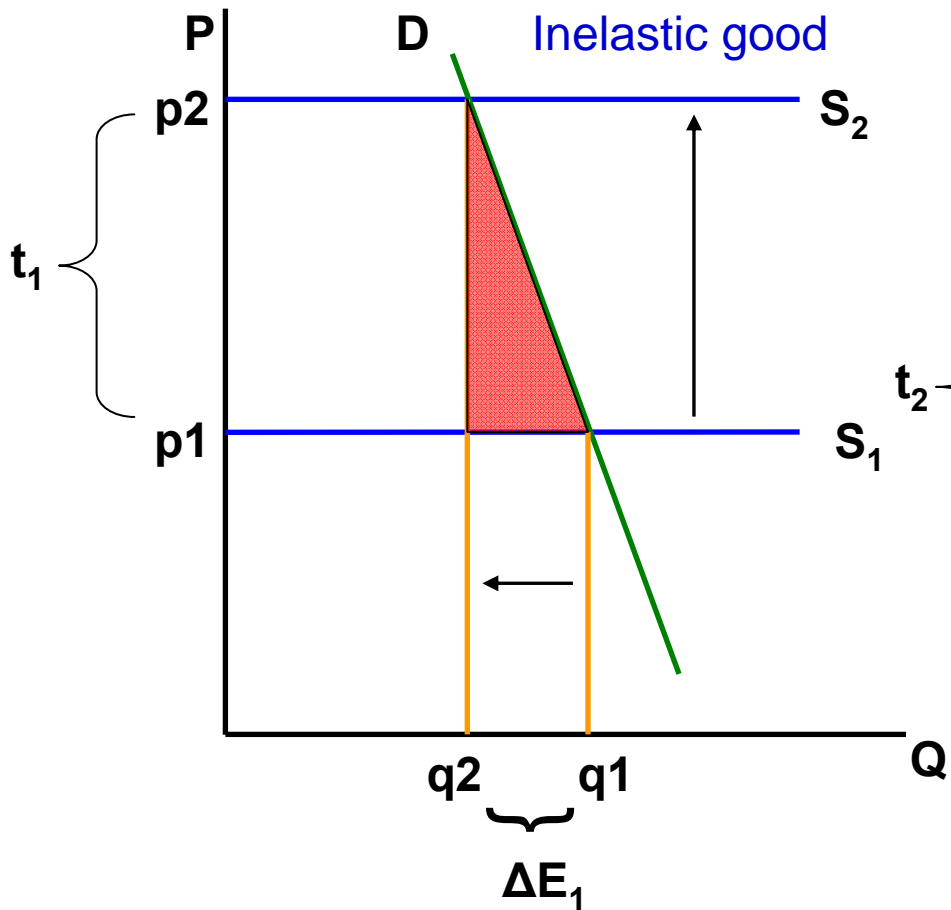
$$\frac{1}{2} * \Delta E_1 * t / \Delta E_1 = \frac{1}{2} t$$

Elastic good



$$\frac{1}{2} * \Delta E_2 * t / \Delta E_2 = \frac{1}{2} t$$

Regulation – 2 goods



$$\frac{1}{2} * \Delta E_1 * t_1 / \Delta E_1 = \frac{1}{2} t_1$$

$$\frac{1}{2} t_1 > \frac{1}{2} t_2$$

$$\frac{1}{2} * \Delta E_2 * t_2 / \Delta E_2 = \frac{1}{2} t_2$$



Permit allocation

Permits can be:

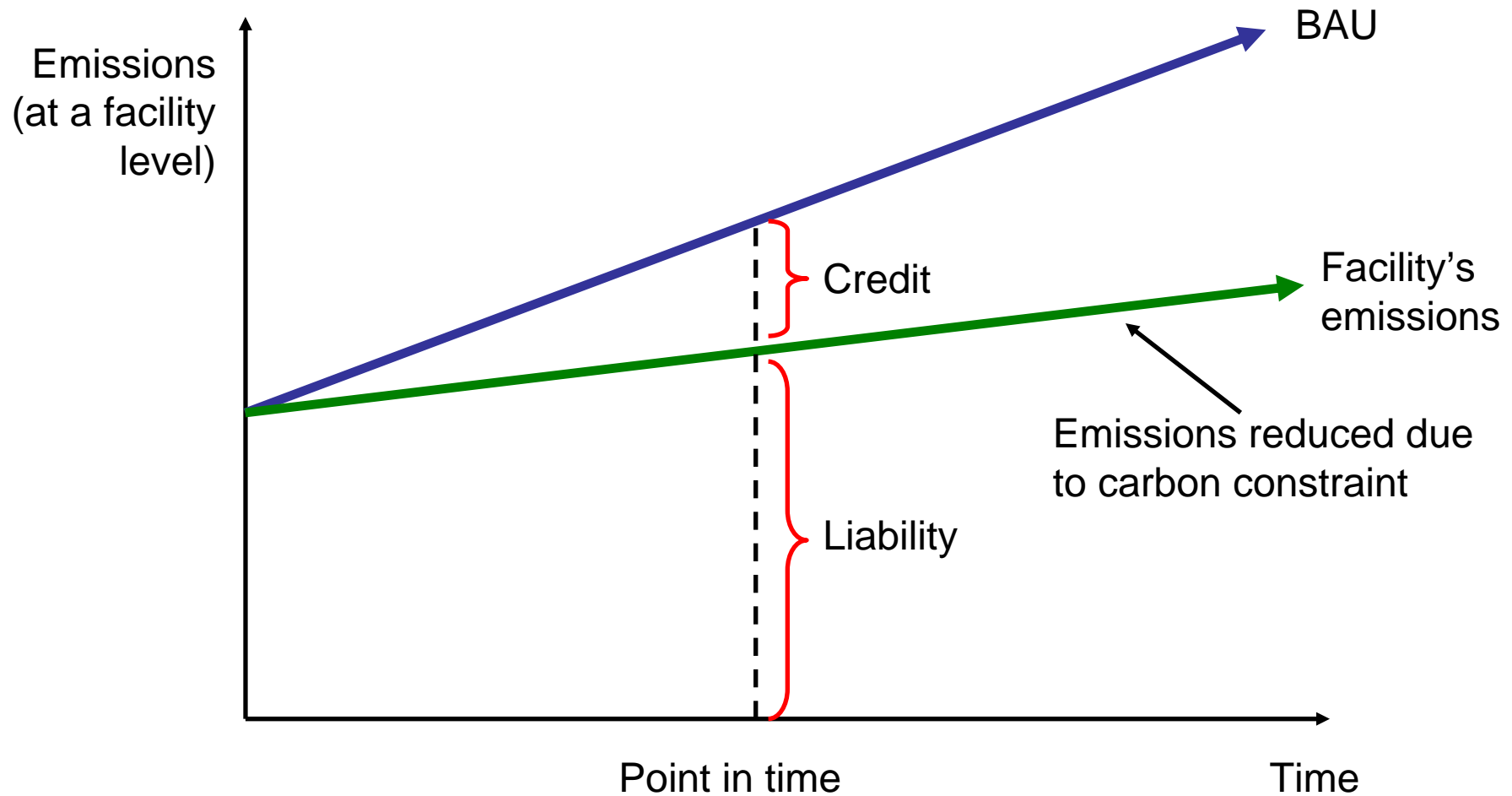
- Auctioned
- Given away for free
- Government has made no commitments
- Generally allocation effects wealth not abatement outcomes



Offsets

- Offsets deliver similar abatement incentives to cap and trade
- Different income transfers
- Additional issues with baseline verification
 - What would have you done otherwise?

Baseline and Credit vs Cap and Trade





International abatement

- Domestic argument for least cost extends internationally
- Issues to do with
 - Verification systems
 - Cap and trade versus offset mechanism
- Link back to building a cooperative game
 - Income transfers to developing countries

Complementary measures

- ETS as central mechanism
- Need for ongoing complementary measures
- ‘Complementarity’
 - How do we prepare for emissions trading?
 - What problems won’t a carbon price fix?
 - externalities
 - information failures
 - natural monopolies
 - public goods



Complementary measure – R&D

- Two market failures for an emission reduction technology
 - General innovation externality
 - Low carbon price
- Justification for R&D support above average while carbon price low
- Over time move to general R&D assistance



Thank you