Overview of Origin Energy

Exploration & Production
2,436 2P reserves
Market focussed portfolio in Australia & New Zealand

Generation*
Total capacity 3659 MW
Gas capable – 2663 MW
Hydro – 752 MW
Geothermal – 244 MW

Origin Energy owns, develops and procures energy and related products and services to provide customers with better choices to meet their energy needs.

Retail*
3.6 m customers in Australia, New Zealand & Pacific
Electricity – 2.3 million
Natural Gas – 958,000
LPG – 357,000

*Includes Contact Energy

Networks
Asset Management services
Envestra investment - 18% interest
SEA Gas pipeline - one third interest
Origin Energy’s Supply Chain Emissions (Mt CO₂e)*
Total supply Chain Emissions = 32.8Mt#; Origin’s Equity Emissions = 3.6Mt

Production & Purchase
Natural gas, LPG and other products
- Origin production 1.3 Mt
- Purchases 1.5 Mt

Transportation
- 1.9 Mt

Customer consumption
- Natural Gas and LPG 10.3 Mt
- 0 Mt

Electricity
- Gas purchased for Origin generation
- Origin electricity & steam generated 1.2 Mt
- Electricity purchased 16.5 Mt

* Origin’s Australian Operations 2004/05
# Represents 12% of Australia’s stationary energy emissions
Introduction

- The climate change challenge - global
- The climate change challenge - Australia
- What could be done with technology?
- What is the role of Government?
- What will be the impact on business?
- How far to go and when?
A Global Cost Curve for Abatement

The technology challenge - initiatives based solely on new technology development are insufficient.

Stabilisation path has been adjusted upward to include CO2 equivalent gases.

Source: ABARE, Asia Pacific Partnership on Clean Development and Climate - technological development and economic growth (2006)
Stationary Energy the major contributor to Australia’s GHG emissions

Total net emissions = 550 Mt in 2002

Electricity supply = 182 Mt
Australia’s 2020 greenhouse emission forecast shows significant growth - of which 90% comes from the stationary energy sector.

“Current Measures” will deliver a reduction of ~105 MtCO$_2$e beyond BAU by 2020, but a further 100MtCO$_2$e required to meet 108% target.

To maintain a 108% target a 200 MtCO$_2$e reduction from BAU is needed.

To achieve an 80% target an additional 150Mt is required from 108% target - a total of 355Mt from BAU in 2020.

“Business As Usual (BAU)” reduces emissions by 105 MtCO$_2$e beyond BAU.

108% target likely with Qld land clearing legislation delivering a further 25MT pa.
Current estimates of the abatement costs for existing technology show the magnitude of the task.

Gas provides an interim solution, but zero emission technologies and renewables are required ... and the problem is still not solved.

Av impact on total generation for 120Mt reduction = $6.1/MWh in 2020

Early retirement of existing capital stock may be required to deliver deep cuts.
What causes change?

- Fear
- Better value (Green Power)
- Opportunity (more revenue, lower cost)
- Corporate positioning, marketing advantage, corporate reputation with stakeholders
- Government Intervention (market failure, political will)
  - Regulation
  - Tax
  - Market-based framework
- (Because it’s a good thing to do)
A Core Climate Change Policy package

- A national long-term aspirational target in line with desired global action
  - Interim firm targets and reviews

- No carbon holiday for new generation investment

- A market-based carbon pricing scheme
  - Cap and trade emissions trading
  - Introduced from 2010
  - Permits to be auctioned with exceptions for allocation for restructuring/compensation and trade exposed sectors in the absence of an international scheme

- Funding for low and zero emission technology research, development and demonstration, eg LETDF, AP6

- Industry development support for renewable energy, eg MRET
In absence of government policy (eg. no new coal) the market will deliver at least cost ... existing coal technology
A gas baseload project is not economic without policy intervention. A $15/t carbon value favours gas.

In the absence of emissions trading, gas-fired investment is reliant on other encouragement such as the GEC scheme...
Economic modelling results - Economic growth under all scenarios

**Australian GDP**

- Scenario 3
- Scenario 2d
- Scenario 2c
- Scenario 2b
- Scenario 2a
- Scenario 1
- Reference case

**World GDP**

- Scenario 3
- Scenario 2d
- Scenario 2c
- Scenario 2b
- Scenario 2a
- Scenario 1
- Reference case
Economic modelling results - A carbon constrained world will be different

Industry impacts: Changes in output in 2050 across mitigation scenarios

Scenario 1
Scenario 2a
Scenario 2b
Scenario 2c
Scenario 2d
Scenario 3

Non-ferrous metals
Iron & steel
Agriculture
Economic modelling results

Electricity affordability: Share of household electricity costs in real average full time wages in 2050

- Surprisingly the affordability of electricity improves - even when more expensive technologies are used

- Why? – whilst residential electricity prices increase between 7 and 20%, real income per capita increases by 100%
Early Action (S1) vs Delayed Action (S2) to achieve equivalent action of a 60% reduction by 2050
Findings of the Energy Futures Forum

- On the basis of risk assessment, it is likely that the global benefits of avoiding climate change will outweigh the global costs of mitigation. However, Australia’s energy intensive and trade exposed industries and the regions they are based in may be disproportionately impacted.

- The Australian and World economies will continue to grow when carrying out greenhouse gas mitigation. Furthermore, electricity can be expected to remain affordable for households.

- The cost of addressing climate change is lowest for Australia when global participation is high and Australia can choose from all available low emission technologies, in partnership with energy efficiency improvements and demand management.

- Uncertainty regarding climate change policy in Australia increases investment risk, particularly in electricity generation. If the risks remain too high for too long then it could lead to higher electricity costs.

- There are a wide variety of emission reduction policies which could be brought to bear in Australia at different times.
Conclusions

- Climate Change impacts are evident and climate change responses are occurring
- A carbon-constrained world will lead to shifts across the economy
- Government intervention is necessary, BUT can and should be constrained
- There are solid reasons for Australia to introduce a domestic emissions trading scheme while the international framework is still emerging
- The net outlook is confused by the apparent clarity of the costs of acting, against the opaqueness of the costs of not acting
- Risk management principles and economic analysis support action
- As with all such changes, climate change and responses to perceptions of climate change will create threats and opportunities
Thank you
Up to 70% species loss

Up to 97% loss of corals

Eg 90% chance of exceeding 4°C

If we stabilise at 575ppm CO₂ we need to stabilise at about 450ppm CO₂ to have a 50:50 chance of staying below a reasonable rise of 2°C

If we stabilise at 550ppm CO₂ Greenland ice sheet commences irreversible melting over some centuries

Base case Business as Usual

Ref: CSIRO 2006