THE COST OF CARBON AND THE IMPACT ON THE MARKET FOR PROJECT FINANCE

CPA Australia, Management Accounting Conference, August 2011

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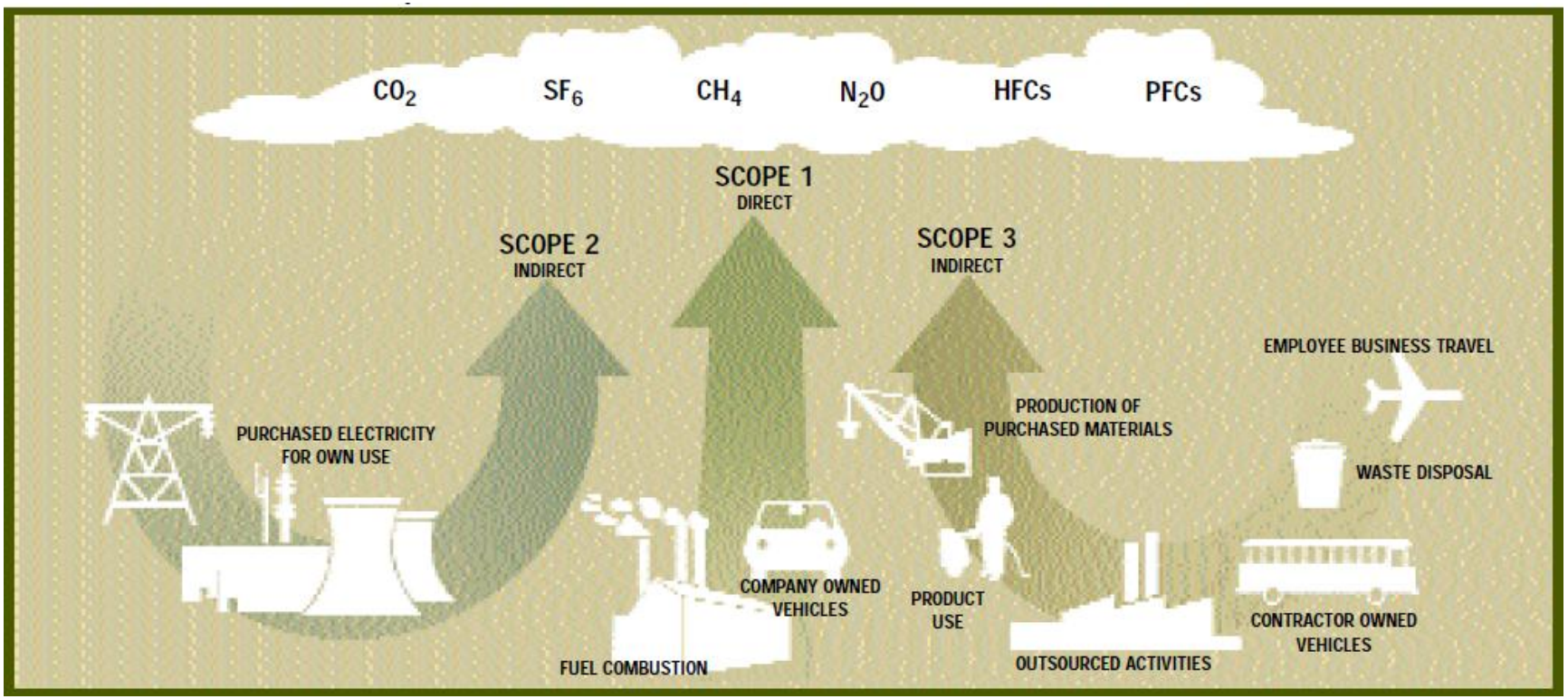
INTRODUCTION

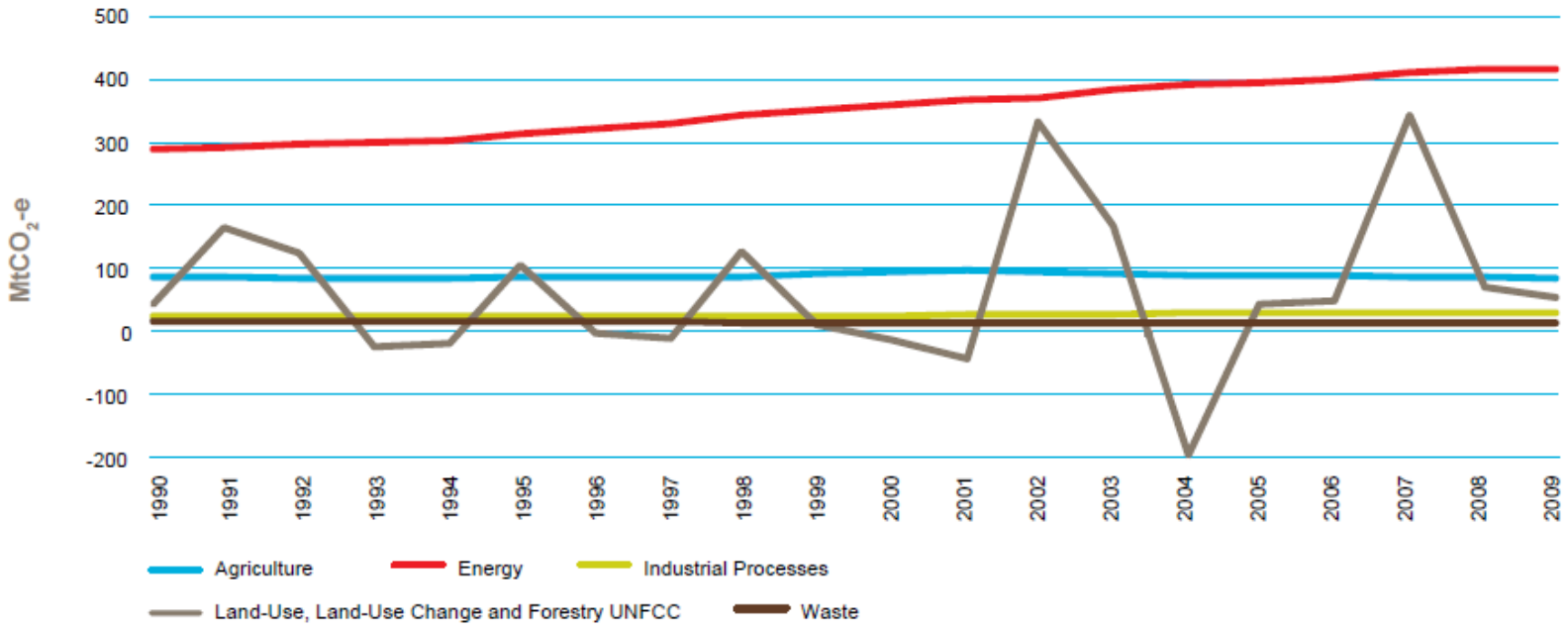
Classification of Greenhouse Gases



Source: The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard, World Resources Institute

Australia's Historic Greenhouse Gas Emissions

Figure ES.1: Australia's net greenhouse gas emissions by sector from 1990 to 2009

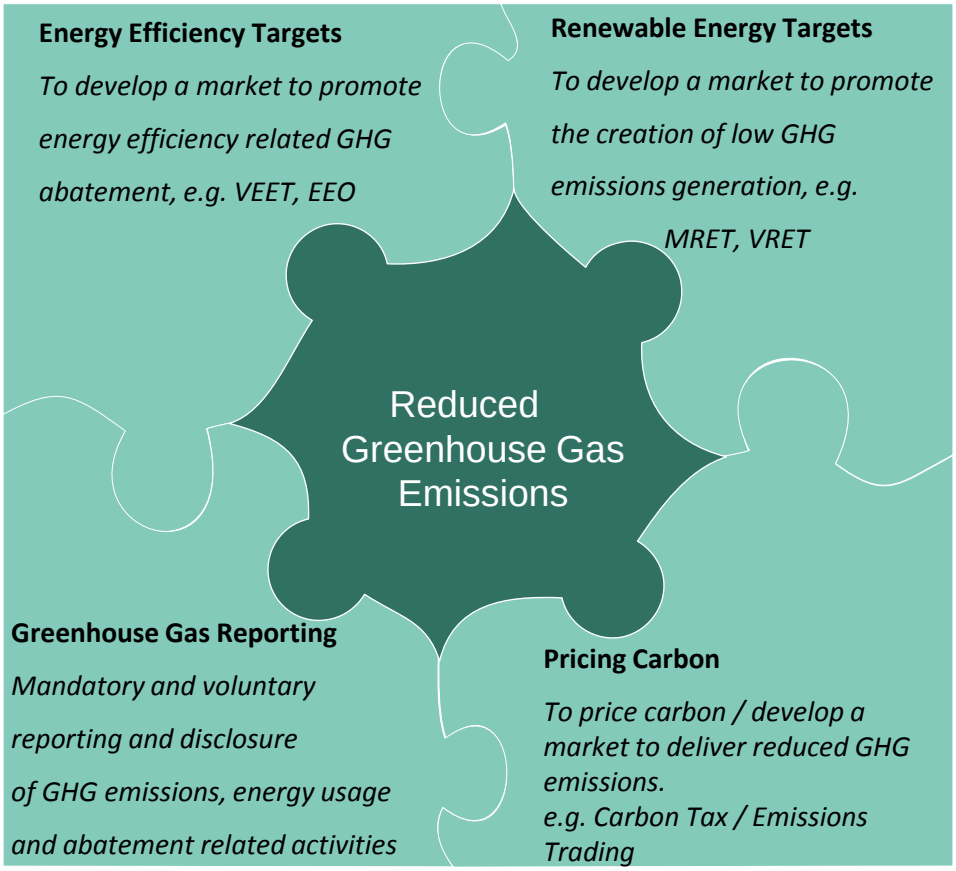


Source: National Inventory Report 2009, The Australian Government Submission to the UNFCCC, April 2011

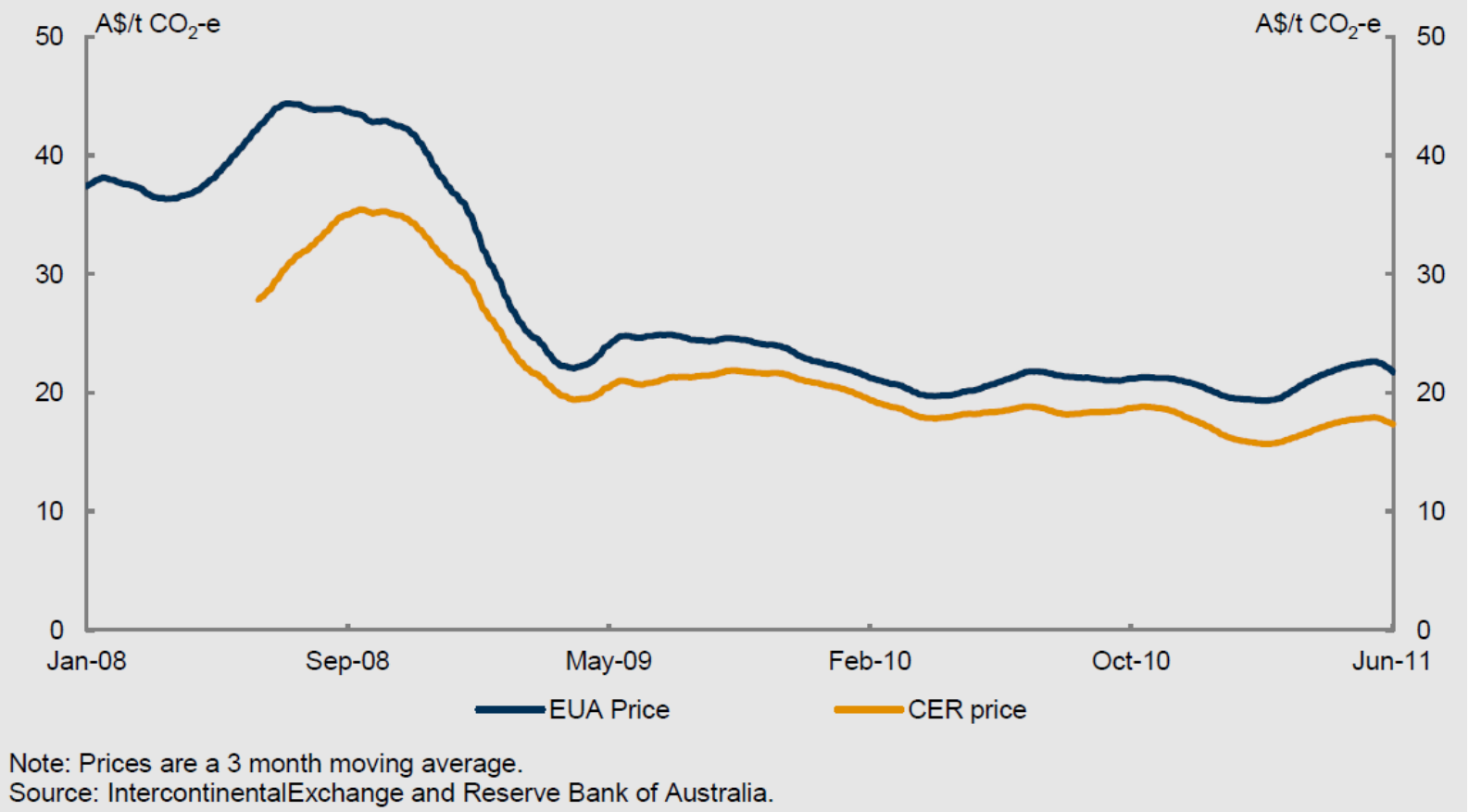
POLICY FRAMEWORK
CLIMATE CHANGE RELATED MARKETS

Objectives

- Achieve emission reduction targets
- Price carbon externality
- Shift value within the economy
- Manage the transition



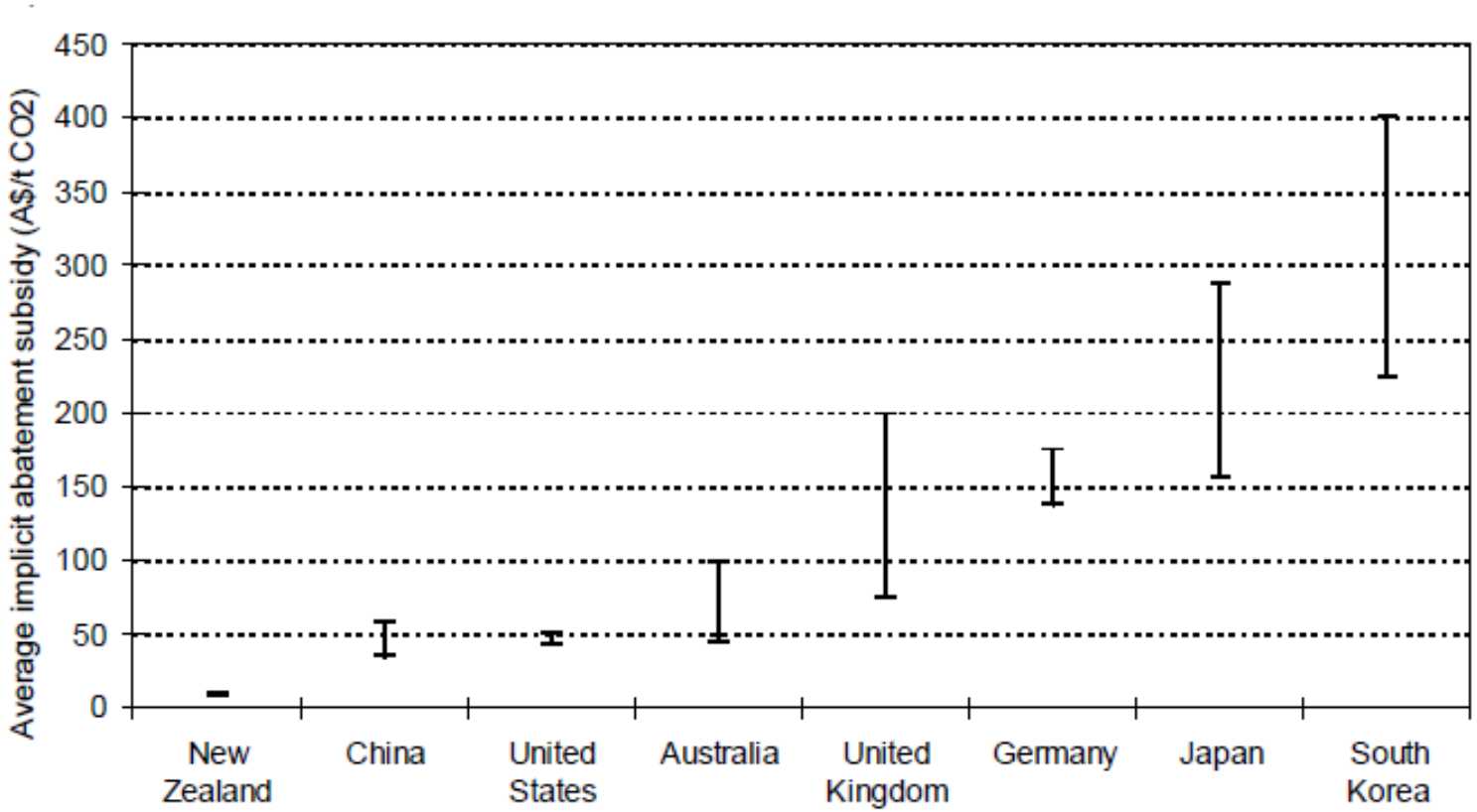
Historic International Carbon Prices



Source: Strong Growth, Low Pollution, Modelling a Carbon Price, Australian Government (Treasury), July 2011.

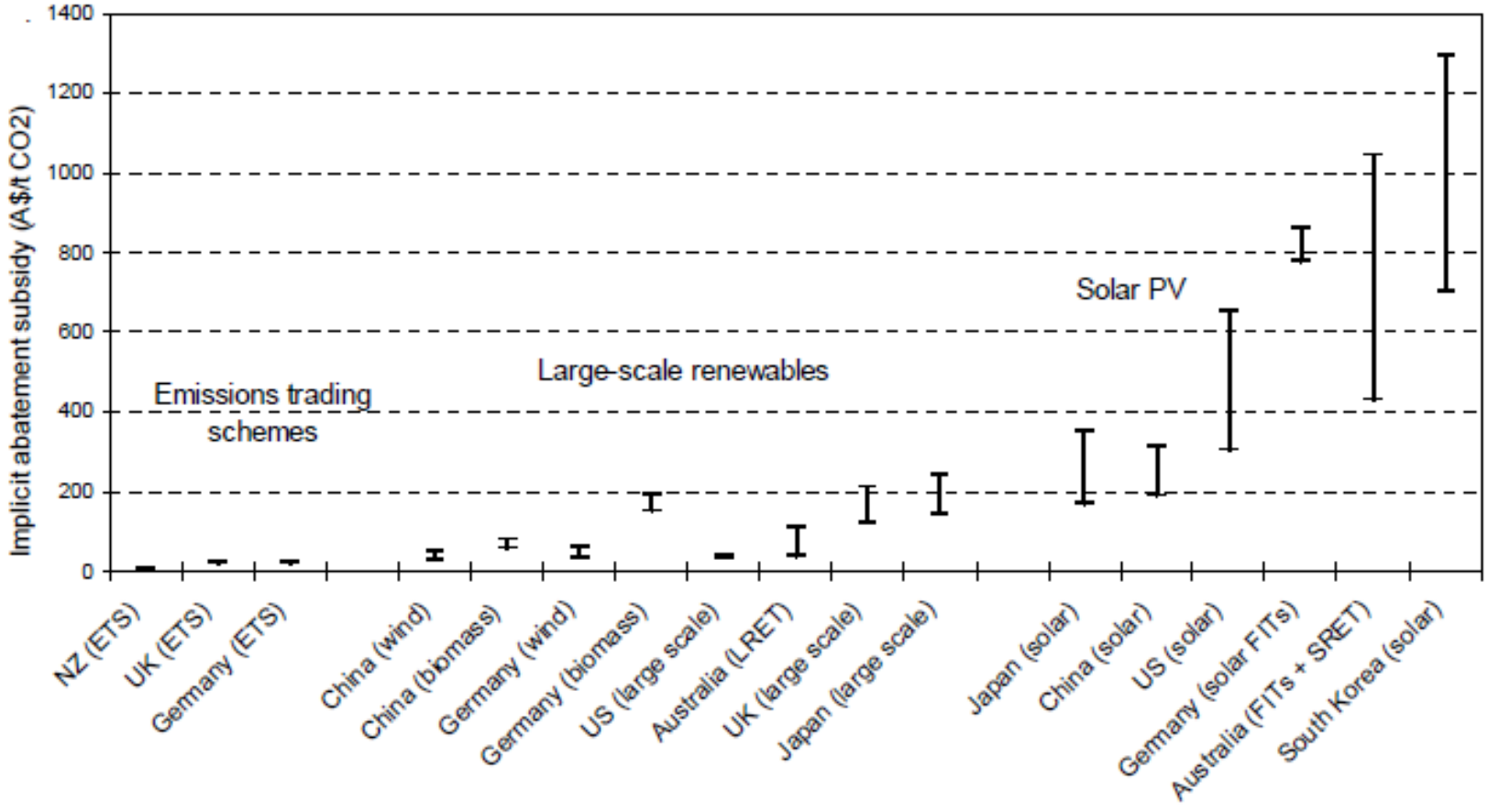
Permit	Price ($AUD) [9 August 2011]
European	$14.88
Kyoto	$10.87
New Zealand	$11.03

Current (Implied) International Carbon Prices



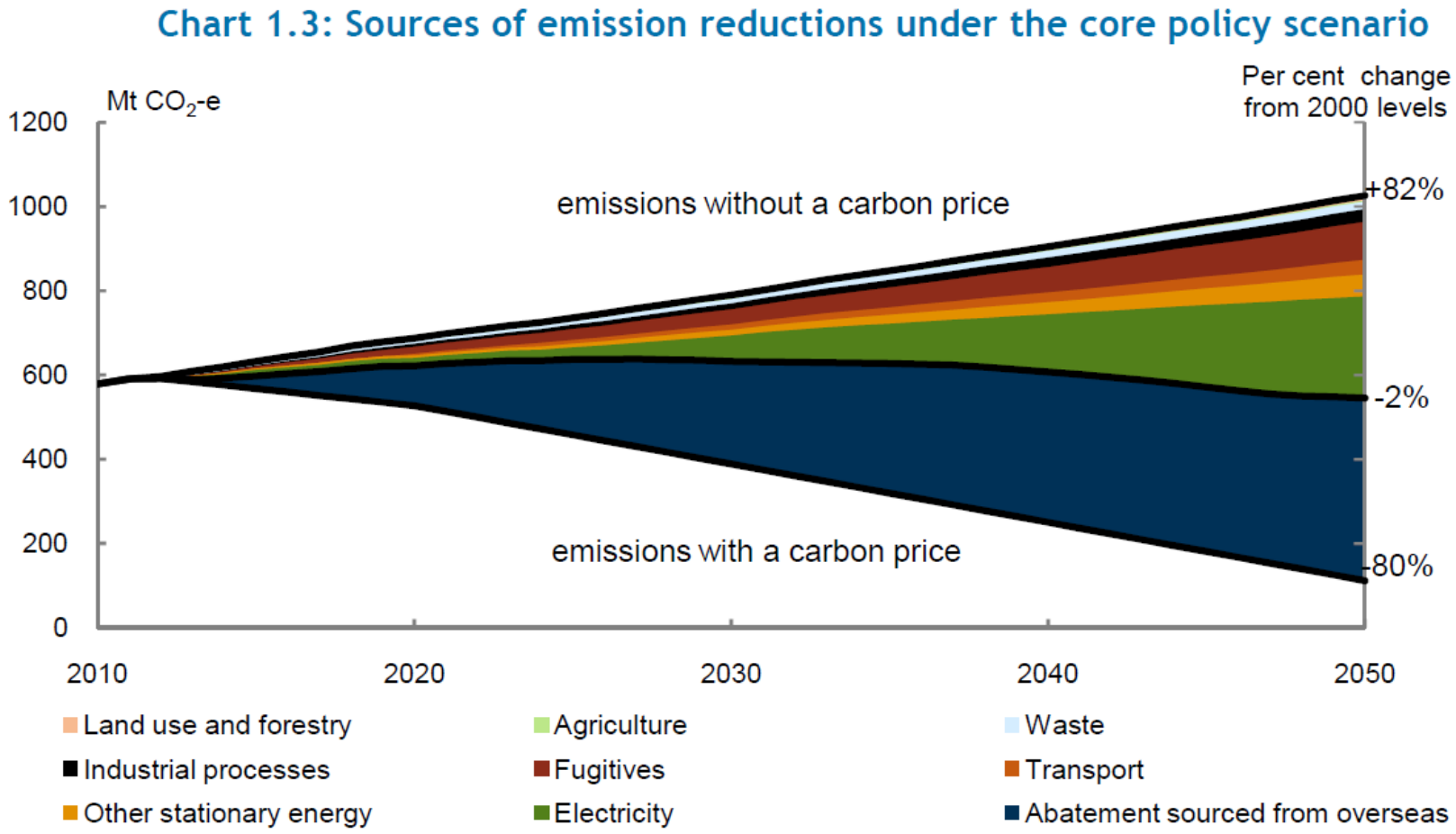
Source: Carbon Emission Policies in Key Economies, Productivity Commission Research Report May 2011

Current (Implied) International Carbon Prices – Electricity Generation



Source: Carbon Emission Policies in Key Economies, Productivity Commission Research Report May 2011

Australia's Forecast Greenhouse Gas Emissions



Source: Strong Growth, Low Pollution, Modelling a Carbon Price, Australian Government (Treasury), July 2011.

OVERVIEW OF CARBON PRICE MECHANISM

Cap and Trade Schemes

Government Revenue (to enable provision of Assistance)

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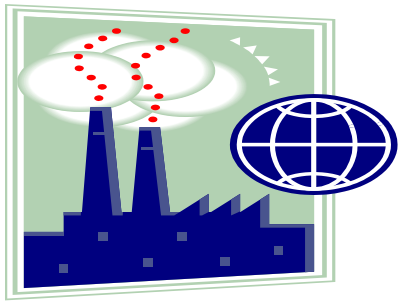
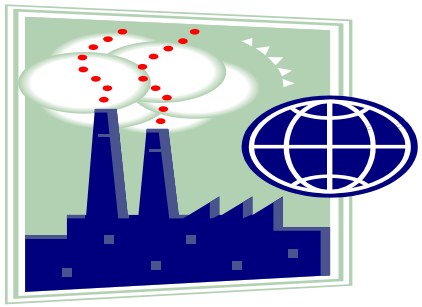
Carbon permit allocation

Total emission cap<BAU



Carbon permit trading



Surrender permits = Annual emissions

Penalty

(and make good provisions)

Note: Permits grant the right to emit CO2

Carbon Price Mechanism – Key Features

- **When will it commence?**
  - 1 July 2012 – Fixed Price Period
  - 1 July 2015 – Floating Price Period

- **Who and what is covered?**
  - Four greenhouse gases included under the Kyoto Protocol (out of 6)
  - Facilities with Scope 1 emissions > 25,000 Tonnes CO2-e per annum and retailers of natural gas or direct suppliers included
  - Stationary energy, industrial processes, fugitive emissions, Emissions from non-legacy waste included
  - Transport – rail, domestic shipping, aviation, off-road uses and non transport users of fuel. Heavy on road transport possibly included from 1 July 2014
  - Agriculture and forestry excluded – except Carbon Farming Initiative can produce carbon credits available for sale locally and internationally

- **How will Australian permits be allocated?**
  - Fixed Price Period – Unlimited permits through a combination of fixed price allocation, free allocation to certain highly emissions intensive trade exposed industries and cash / free allocation to Coal Fired Electricity Generation.
  - Floating Price Period – Annual capped permits through a combination of auctioning, free allocation to Emission Intensive Trade Exposed (EITE) and free allocation to Coal Fired Electricity Generation.

Carbon Price Mechanism – Key Features

- **What price protection will be implemented?**
  - Fixed Price Period – price moves from $23 / Tonne increasing by CPI + 2.5%
  - Floating Price Period (first three years) – Price floor of $15 (increasing by CPI + 4%) and price cap of Expected International Price + $20 (increasing by CPI + 5%)

- **How will the scheme be linked internationally?**
  - Fixed Price Period – N/A
  - Floating Price Period – Through Kyoto (CERs / ERUs) and consideration of other schemes (e.g. Europe / NZ etc) but will be capped at up to 50% of an entity's liability. This will be to ensure some emissions reduction occurs within Australia

Carbon Price Mechanism – Key Features

- **What assistance may be available?**
  - Energy Security Fund:
    - Negotiated closure of ~2000 MW of high emissions coal fired generation
    - Allocation of cash and permits ~$5.5 billion over 6 years
    - Loans to purchase vintage carbon permits and refinance debt if required
  - Jobs and Competitiveness Program: Free allocation of permits to certain industries
    - 94.5% of industry average carbon costs through free permits for most emissions intensive industries e.g. steel, aluminium, cement, glass, paper / pulp
    - 66% of industry average carbon costs through free permits for less emissions intensive industries e.g. some plastics / chemicals, ethanol production
    - Assistance reducing at 1.3% per annum
  - Clean Technology Investment Program: $1.2 billion investment in innovation across manufacturing
  - Small business assistance: Energy Efficiency Information Grants, small business write offs, clean technology investment program
  - Households: tax cuts, increases in pensions, allowances and family payments.

Carbon Price Mechanism – Key Features

- **How will the scheme be governed?**
  - Clean Energy Regulator: Administration of all elements of the carbon price mechanism including Renewable Energy Target, National Greenhouse and Energy Reporting System, Carbon Farming Initiative and the surrender / creation of permits.
  - Climate Change Authority: An advisory body that will track Australia's emissions levels and provide independent advice and guidance to the Government on the performance of the carbon price and other initiatives including targetted emissions levels.
  - Productivity Commission: will review international policy developments and the impacts on Australia and the levels and types of assistance provided by the Government.
  - Australian Renewable Energy Agency: to co-ordinate $3.2 billion of existing grant funding programs into research, development and demonstration of new renewable energy technologies.
  - Clean Energy Finance Corporation: to co-ordinate $10 billion in new commercial investments through loans, guarantees and equity investments in renewable energy, energy efficiency and low emissions technologies.
  - Government: Responsible for major policy decisions and setting of caps

Carbon Price Mechanism – Key Obligations

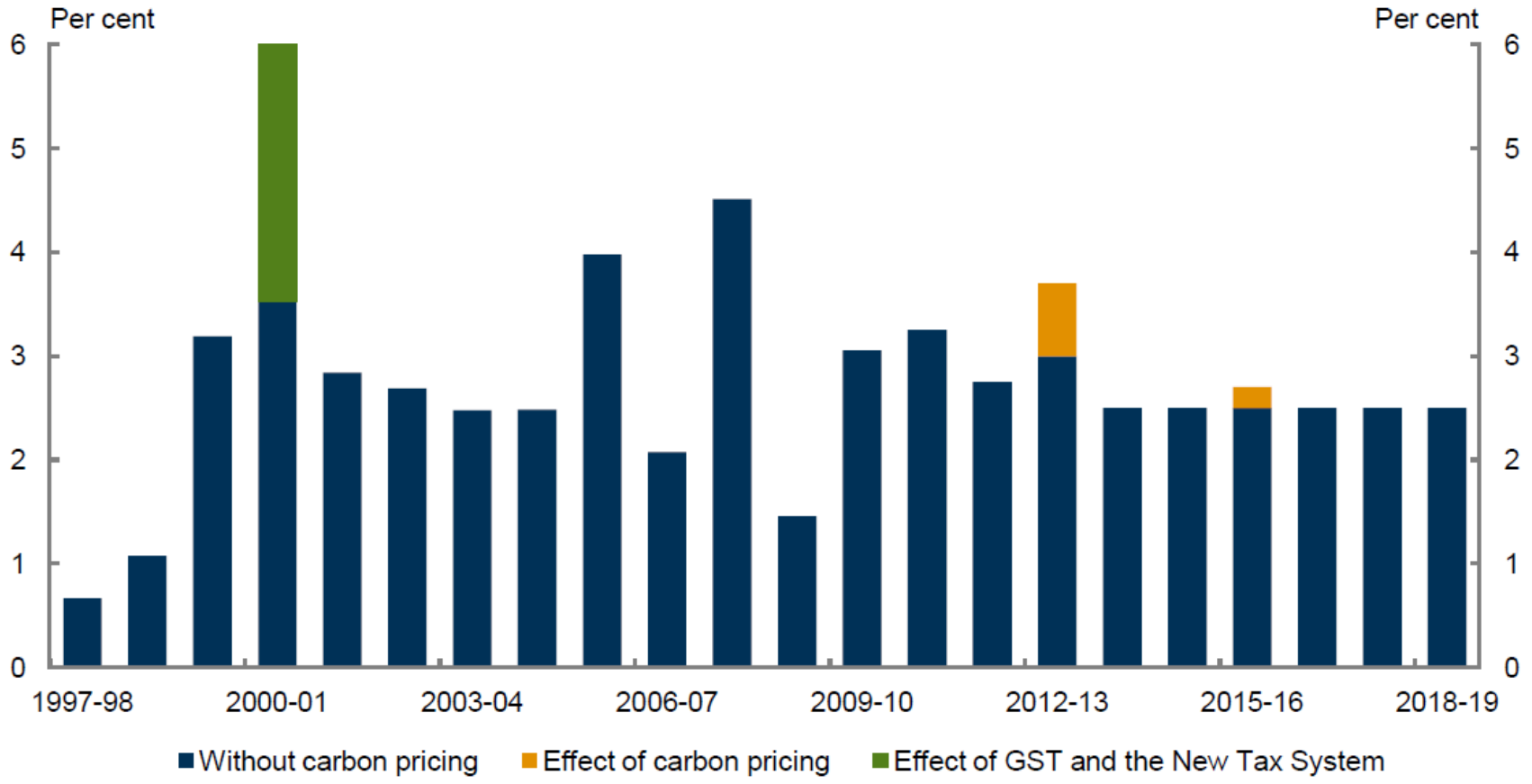
Compliance

- Register for NGER (mandatory or voluntary)
- Calculate annual emissions
- Submit emissions reports
- Surrender emissions units
- Relinquish units (if required)
- Notify significant holdings
- Keep records
- Audit

Transactional

- Fixed Price / Auction participation and settlement
- Obligation transfer number requirements
- Liability transfer certificates
- Secondary market participation
- International market participation

Overall economic and cost impacts - CPI



Source: Strong Growth, Low Pollution, Modelling a Carbon Price, Australian Government (Treasury), July 2011.

ELECTRICITY SECTOR IMPACTS

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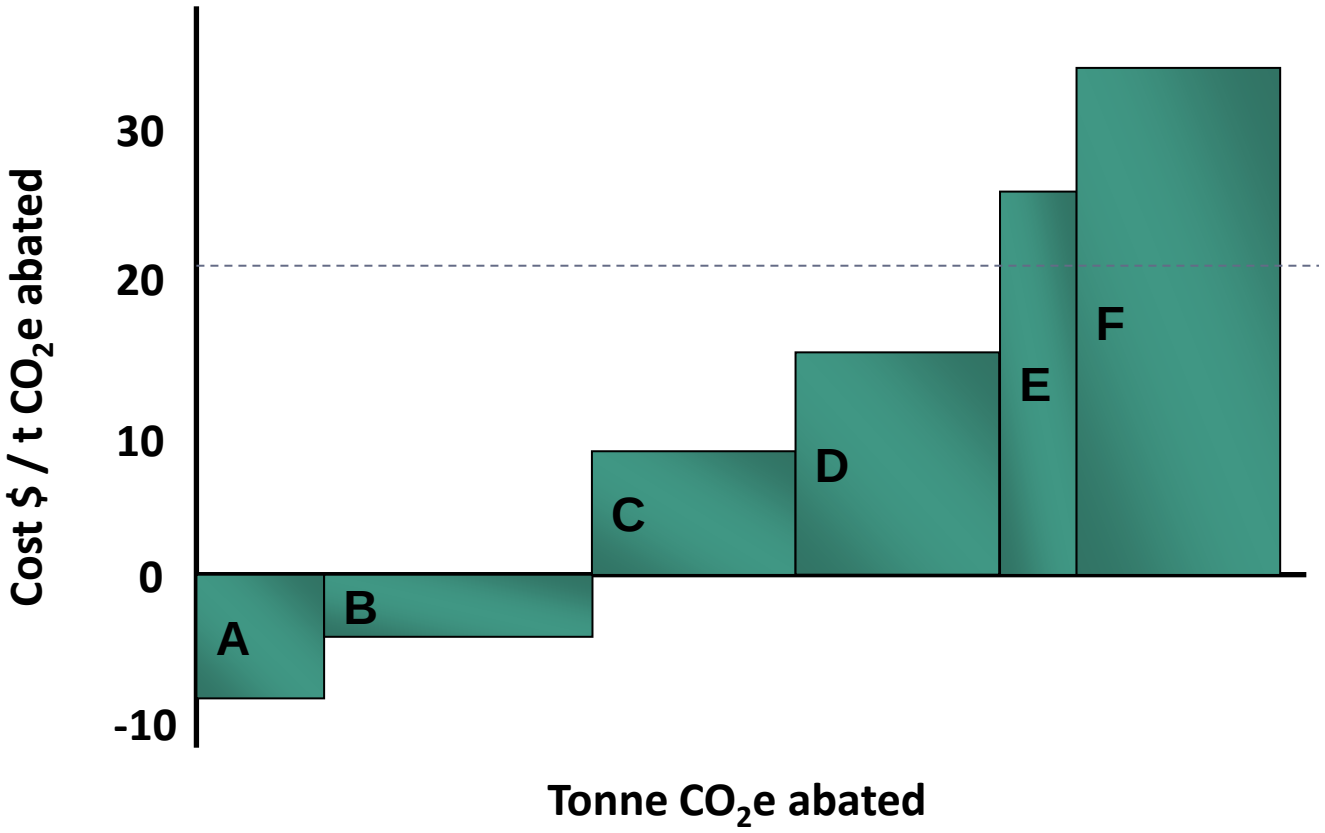
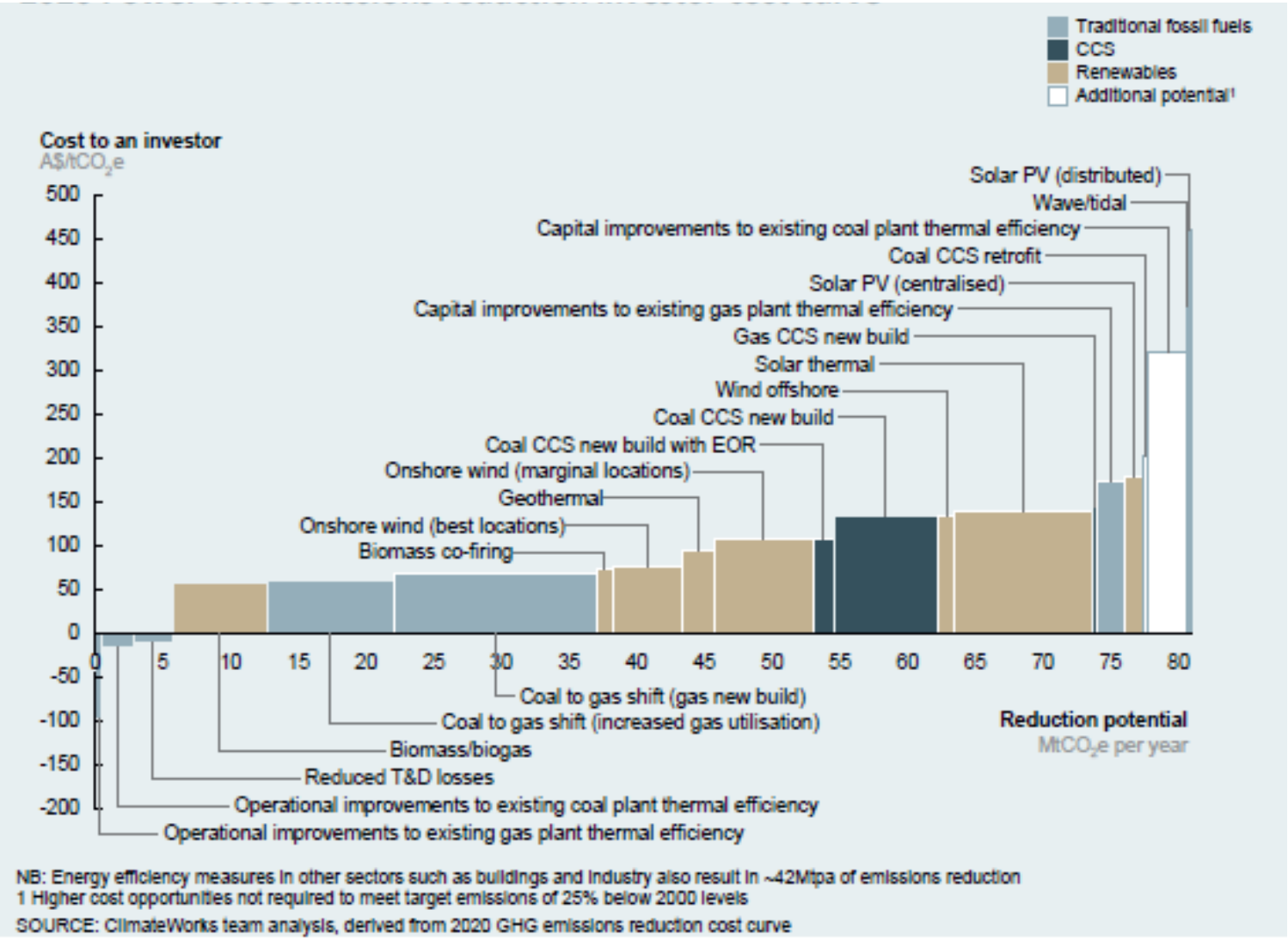
Marginal Abatement Cost Curve - Generic

The fundamental question is do you buy permits or reduce emissions?

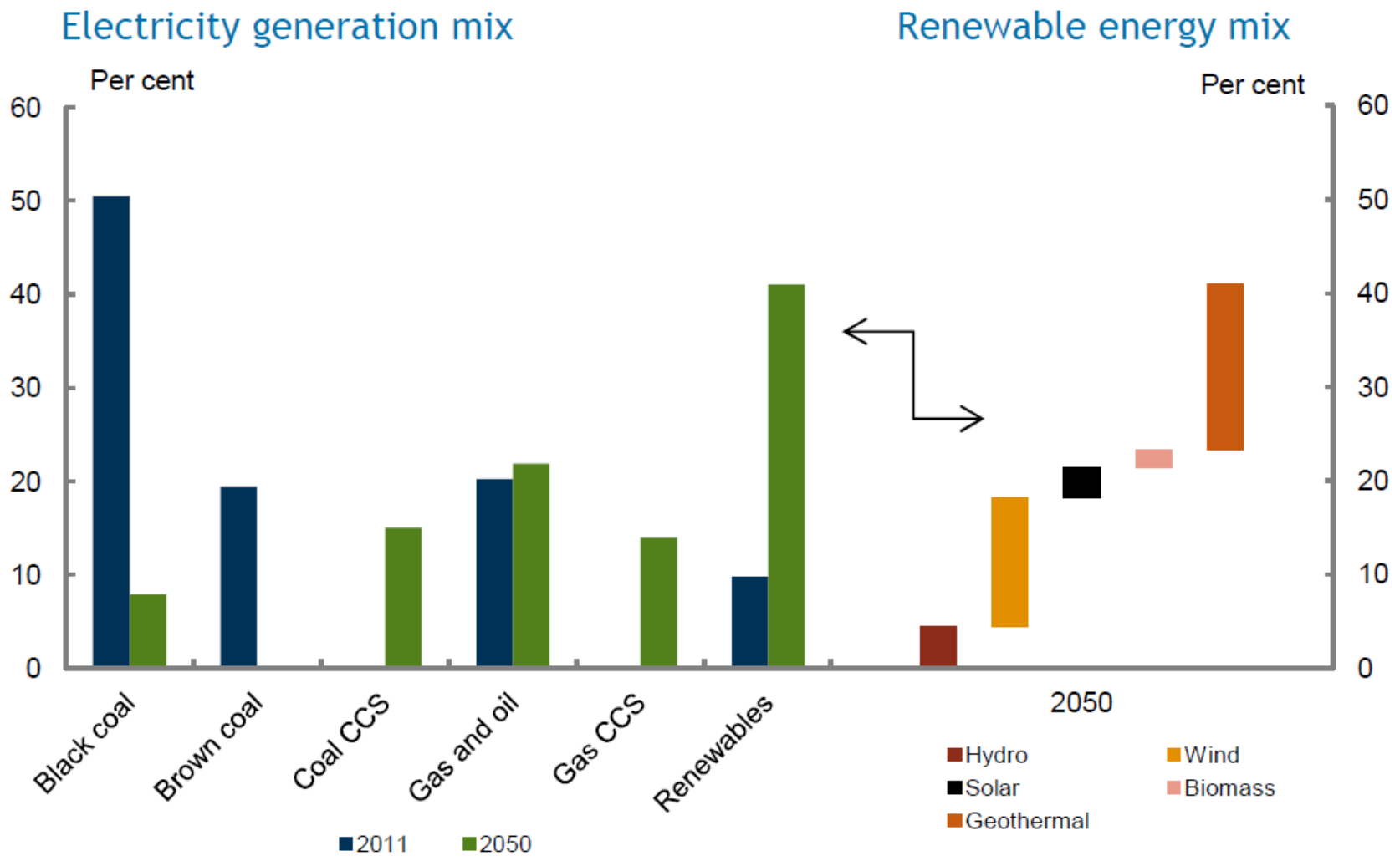


Marginal Abatement Cost Curve – Electricity 2020



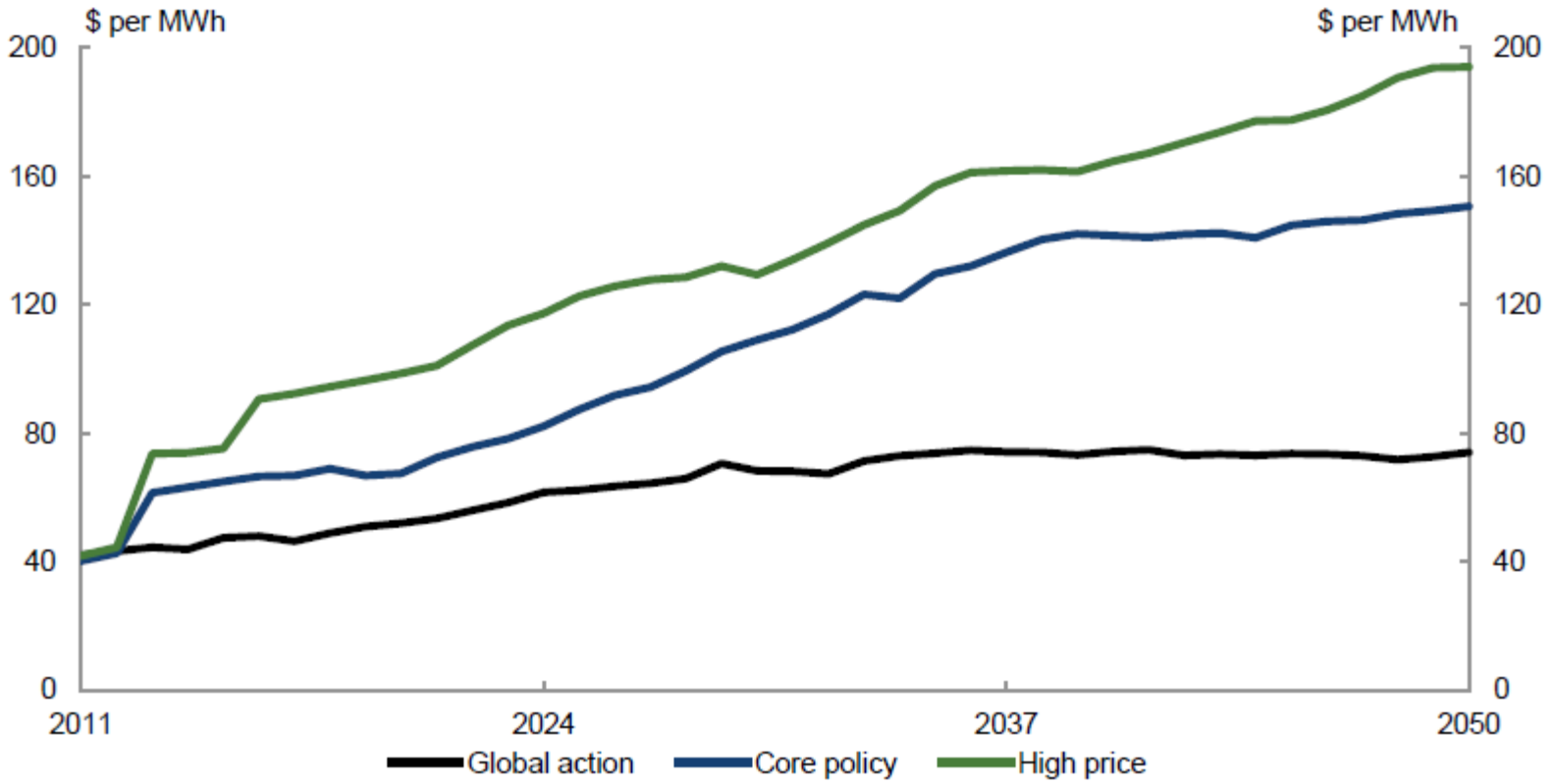
Source: Low Carbon Growth Plan For Australia, ClimateWorks Australia, March 2010

Changes in Electricity Generation Mix



Source: Strong Growth, Low Pollution, Modelling a Carbon Price, Australian Government (Treasury), July 2011.

Average Wholesale Electricity Prices



Note: Prices are in 2010 dollars. Global action is the average of medium and ambitious global action scenarios.

Source: Strong Growth, Low Pollution, Modelling a Carbon Price, Australian Government (Treasury), July 2011.

Average Wholesale Electricity Price Increases (Percent)

	Core policy			High price		
	2013-2017	2018-2022	2046-2050	2013-2017	2018-2022	2046-2050
NSW	38	35	123	76	89	189
VIC	45	39	85	86	105	140
QLD	47	43	122	94	100	192
WA	32	37	98	48	84	143
SA	38	35	69	75	91	121
TAS	40	42	80	76	104	130
National average	40	38	106	78	94	166

Source: Strong Growth, Low Pollution, Modelling a Carbon Price, Australian Government (Treasury), July 2011.

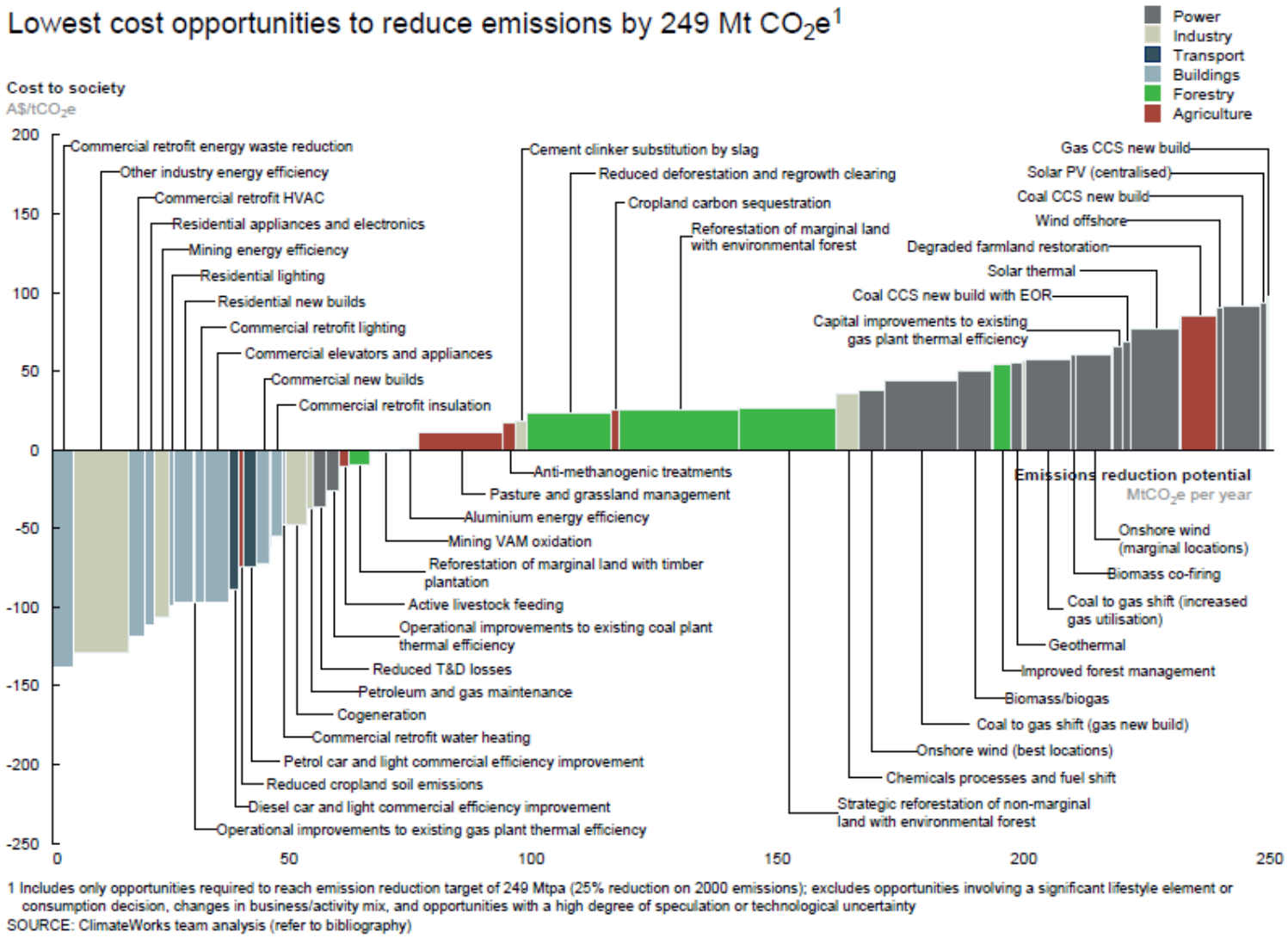
Average Household Electricity Price Increases (Percent)

	Core policy			High price		
	2013-2017	2018-2022	2046-2050	2013-2017	2018-2022	2046-2050
NSW	9	8	35	16	19	52
VIC	10	8	31	20	25	52
QLD	10	9	35	20	21	57
WA	10	10	37	14	23	55
SA	8	7	23	16	19	40
TAS	9	9	28	16	23	45
NT	8	6	24	18	20	53
Average	10	8	33	17	21	51

Source: Strong Growth, Low Pollution, Modelling a Carbon Price, Australian Government (Treasury), July 2011.

BUSINESS AND SECTOR LEVEL IMPACTS

Marginal Abatement Cost Curve – Australia 2020



1 Includes only opportunities required to reach emission reduction target of 249 Mtpa (25% reduction on 2000 emissions); excludes opportunities involving a significant lifestyle element or consumption decision, changes in business/activity mix, and opportunities with a high degree of speculation or technological uncertainty

SOURCE: ClimateWorks team analysis (refer to bibliography)

Source: Low Carbon Growth Plan For Australia, ClimateWorks Australia, March 2010

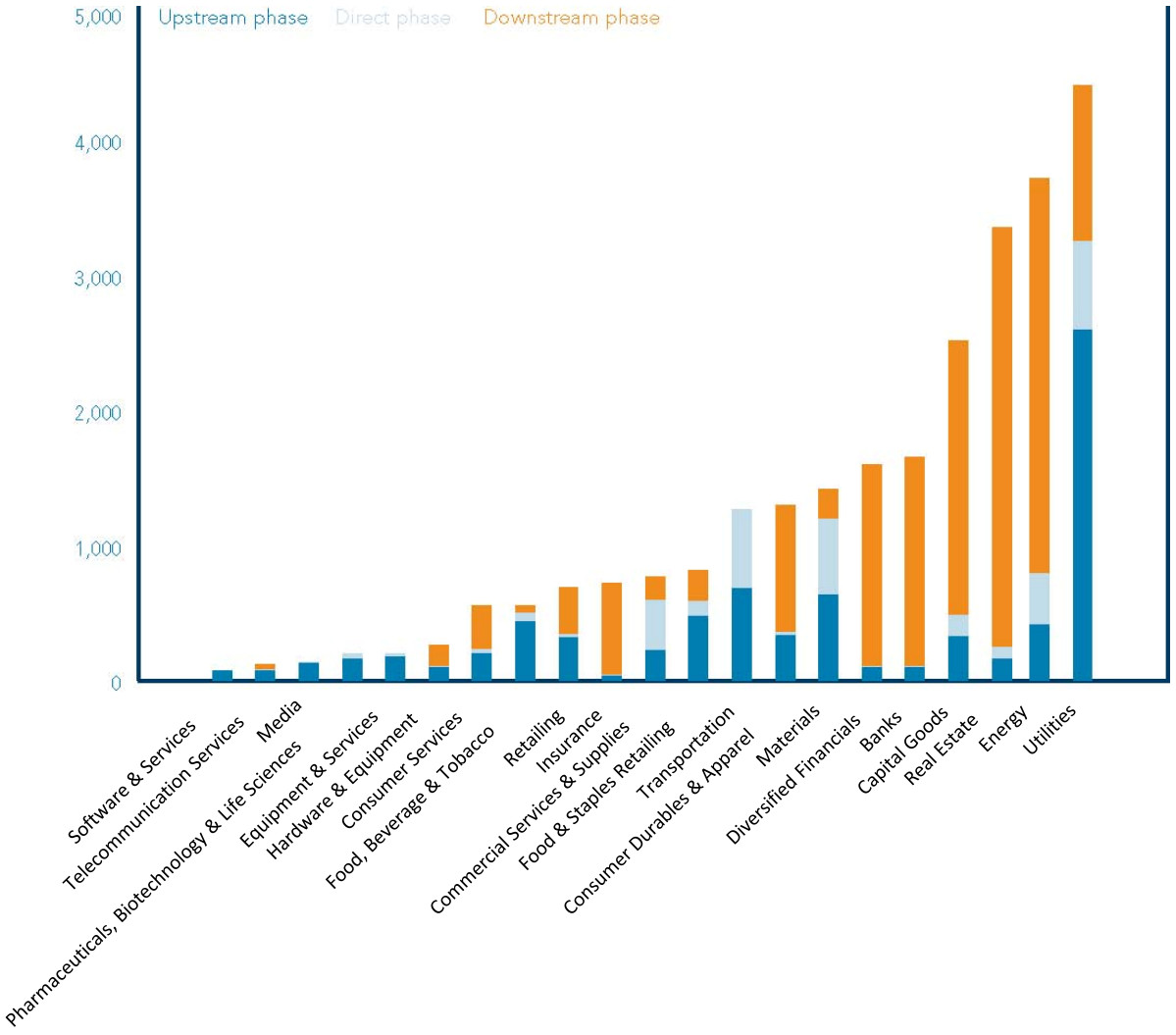
Business Impact Drivers

Driver	Key factors
Emissions profile	Emissions level, emissions intensity, energy intensity Abatement costs and potential Relative competitiveness
Transitional assistance	Level Duration Eligibility criteria
Cap and permit allocation basis	Emissions cap and trajectory levels Permit price caps International linkages
Complementary measures	Tax rebates / grants / concessions Renewable energy targets Energy efficiency targets
Market elasticity	Pricing and volume impacts on major inputs and outputs
Strategy adopted	Relative position - from adaptation and mitigation, through to trading

Carbon Risk: Calculating the net gain or loss

Category	Negative	Positive
Indirect carbon costs	Mainly electricity and fuel	Pass cost increases through to consumers
Direct carbon costs	Permit acquisition, voluntary offset acquisition, Penalties	Sales of excess permits Sales of abatement credits
Operating costs	Carbon management costs Carbon derivative losses	Carbon derivative gains
Mitigation/Adaptation expenditure	Operating costs Capital and R&D costs	Cost reductions
Net shareholder value	Disproportionate loss in asset value Carbon cost flow-through	Free allocation of permits

ASX 200 – Carbon Intensity (tonnes CO2e / $m)



Source: RepuTex , 2008

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Carbon risk
Key Impact Points

Capital Expenditure

- Emissions reductions technology (energy efficiency, fuel switch, investments etc)
- Location change
- Compliance costs

Market Elements

- Market risk (beta)
- Reputation & brand

Balance Sheet

- Physical weather exposure
- Asset base depreciation, underperformance
- M&A activity, transactions
- Litigation risk

Operating Expenditure

- Permit costs and price risk
- Supply chain costs (electricity), fuel costs
- Abatement costs or savings
- Compliance costs (monitoring, verification, disclosure)
- Foreign exchange (via CER's)
- Increased fraud risk from overseas permits

Revenue

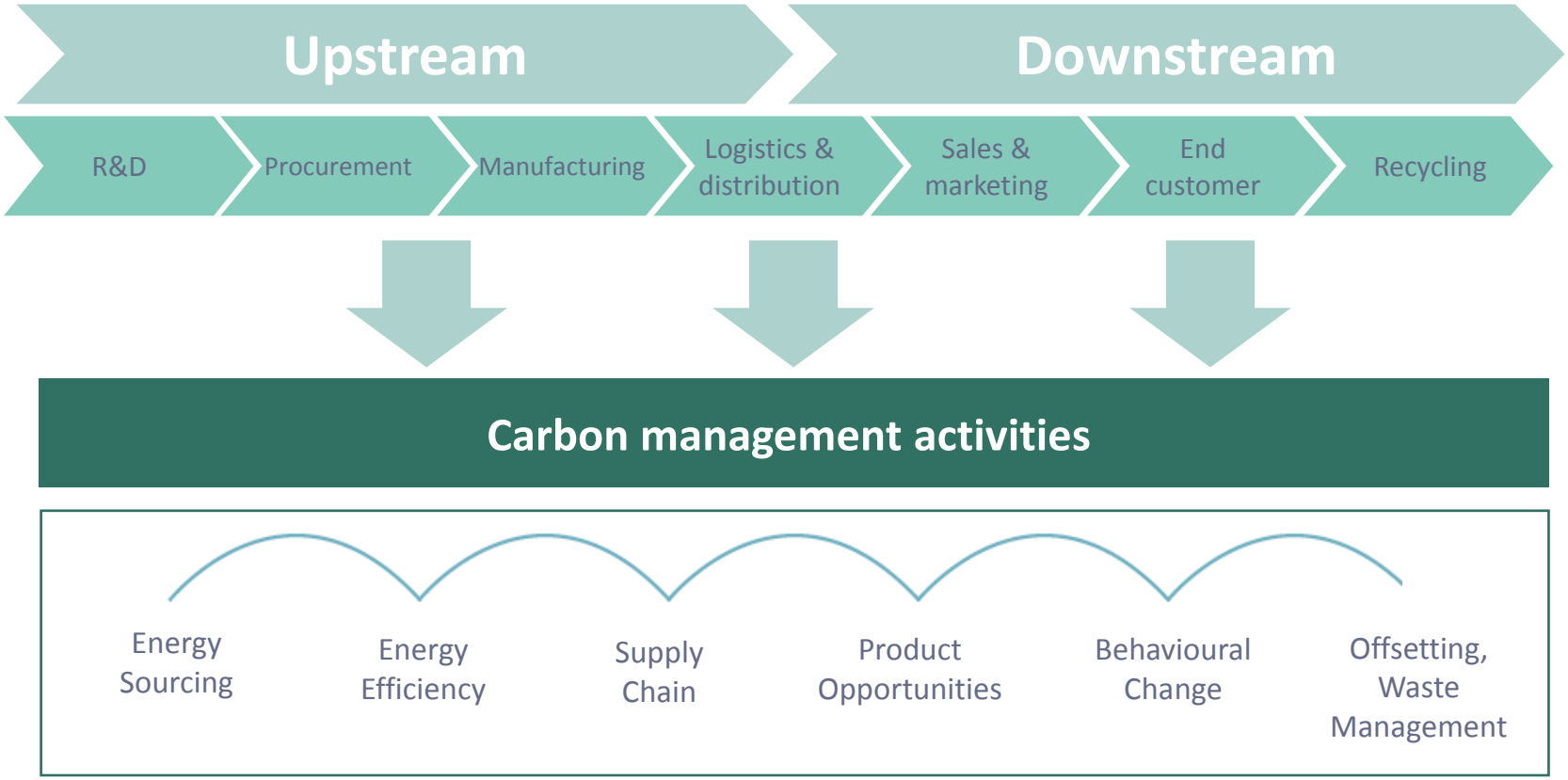
- Sale of excess credits
- Consumer preferences
- CDM pipeline, portfolio, assets
- Foreign exchange (via CER's)

Business Response Framework
Questions for businesses to consider

- What is our business as usual emission projection?
- How far can this be reduced to minimise exposure in the future?
- What is our marginal cost of abatement?
- Can we justify investing in low carbon technologies?
- What is our carbon risk management strategy – now and for planned growth – with respect to:
  - **Asset valuations**
  - **Planned investment / divestment**
  - **Market substitutes and alternatives**
  - **Supply chain**
  - **Type and source of permits purchased**

- How is our existing portfolio risk profile changed?
- What are our suppliers likely to do with respect to cost pass through (direct or indirect)?
- How do we provide our shareholders with reassurance that the risk to return on their investment is minimised?
- Will the carbon price cause any competitive distortion?
- What policy changes should we consider to manage our future exposure to carbon markets?
- What measurement and management techniques do we develop?

Business Response Framework
Carbon Management Activities



IMPACT ON FINANCING

The carbon price package will assist in financing however……

It will assist in:

- Providing additional regulatory certainty for investors
- Improving the economics of higher cost new technologies that have reduced emissions
- Creating the Clean Energy Finance Corporation

But…..

- Long term price uncertainty still exists – especially with international linkages in carbon prices
- Regulatory uncertainty still exists - surrounding complementary measures
- Renewable energy financing will still require an off take agreement
  - Limited number of large buyers of renewable energy

There are three broad options for lenders to incorporate carbon considerations into lending practices

Governance & Policy

- Specific policy on financing carbon-intensive businesses
- Country and industry limits

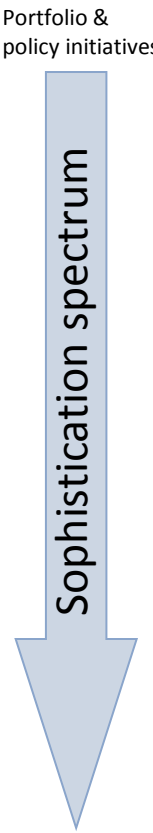
Process

- Changes to policy or underwriting guidelines
  - Establishing business rules that incorporate carbon risk
  - Industry benchmarks and external data that consider carbon risk drivers and metrics

Measurement

- Measure financial impact of carbon constraints
- Inclusion in risk grading models:
  - Customer risk grade to influence Probability of Default estimate
  - Security quality indicator to influence Loss Given Default estimate
- Qualitative component of credit evaluation process:
  - Concentration limits
  - Project / asset specific carbon footprint considerations

Key considerations for lenders to address carbon exposures



- Business rules need to be established to determine the need for the carbon measure to be incorporated in either a model or process (or both) to ensure the nature of the exposure is understood and consequently the carbon impact is appropriately treated
- There is a need to understand sector drivers and characteristics to ascertain if the carbon exposure impacts credit risk default probability or security position (or both)
- The nature of the security position (i.e. secured vs unsecured) will determine if carbon risk should be incorporated into Probability of Default, Loss Given Default or both
- Carbon exposure considerations should also be included in downstream pricing models

International Experience of carbon considerations in lending

- A study[1] identified more than 25% of banks surveyed adopted (or are adopting) risk management policies and/or lending procedures to address exposures arising from climate change.

  Three broad categories of responses were identified:

  – Inclusion of climate change consideration in credit policies / lending practices, examples include

    Merrill Lynch has a specific policy on financing coal fired electricity generation.
    Citi incorporates the potential costs of carbon in their financing of power generation

  – Assisting clients analyse carbon exposure and developing emissions reduction strategies, examples include:

    HSBC requires clients to disclose their carbon emissions and mitigation strategies
    Citi, Royal Bank of Scotland and *TD Bank Financial Group* are encouraging clients who are large GHG emitters to develop mitigation plans

  – Calculating carbon risk for inclusion in their risk grading models, examples include:

    Royal Bank of Canada has undertaken a carbon risk analysis of its lending portfolio and has developed a proposal to incorporate carbon risk into their credit and risk rating methodologies.

Source: The Ceres Group, *Corporate Governance and Climate Change: The Banking Sector*, January 2008

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