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Evaluation of likely cost impacts of the Carbon Pollution Reduction Scheme on 6 red meat processing plants

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1 Background

Meat & Livestock Australia Limited (**MLA**) has developed a financial model (**the Model**) for the purpose of evaluating the likely direct cost impacts of the Australian Government's proposed Carbon Pollution Reduction Scheme (**CPRS**) on six red meat processing facilities (**the Plants**) operated by members of the Australian Meat Industry Council (**AMIC**) and the Australian Meat Processor Corporation Limited (**AMPC**). This analysis was undertaken based on the CPRS White Paper (**the White Paper**) released by the Department of Climate Change on 15 December 2008.

Meat processing facilities typically generate direct emissions relating to stationary energy for direct combustion of fossil fuels at the Plant (e.g. to generate hot water for sterilisation and rendering), to the use of synthetic gases (e.g. refrigerants) and to waste for Plant-operated treatment of wastewater. The treatment of solid waste is generally outsourced to specialised waste facilities that have operational control over their emissions.

Based on the White Paper, a number of Plants may therefore have a liability to acquit permits under the CPRS for their direct emissions (Policy Position 6.2 and page 6.15). In addition, a number of Plants may also incur additional CPRS-related cost impacts passed through by electricity suppliers and waste management facilities.

Based on the White Paper, it is not certain whether any of the Plants will be eligible for compensation under the emissions-intensive trade-exposed (**EITE**) scheme.

2 Model overview

Model specifications

The Model has been built based on the following specifications:

- Assessment of CPRS carbon permit liability costs for scope 1 emissions in the following sectors, as defined by the CPRS: stationary energy (fuel and gas combustion), waste (industrial wastewater treatment) and industrial processes (synthetic gases for refrigeration and air conditioning).
- Assessment of CPRS carbon permit liability costs passed through to the Plants by suppliers of fuel and gas, as well as for the Plants' scope 2 emissions (purchased electricity) and scope 3 emissions (solid waste to landfill).
- For each of the six Plants, assessment of the total costs set out above incurred between 1 July 2010 and 30 June 2011, per head and per tonne of hot standard carcase weight (**HSCW**) for processed red meat (cattle, calves, sheep and lamb), based on actual data provided by the Plants for the period 1 July 2007 to 30 June 2008 (except for 1 Plant, which provided data for the period 1 July 2006 to 30 June 2007).

Model exclusions

The Model does **not** consider the following specifications:

- Assessment of any other carbon costs incurred by the processing facilities, including direct and indirect carbon costs for any other emission sources other than those listed above (see Model specifications), the costs related to emissions from the agriculture sector, the costs to comply with the CPRS or the increased water costs.
- Potential cost savings the processing facilities could generate on account of implementation of low cost greenhouse gas emission abatement activities.
- Assessment of potential financial assistance that each of the six facilities may receive under any of the current known forms of assistance, being the EITE or Climate Change Action Fund (CCAF) features of the CPRS, between 1 July 2010 and 30 June 2011.
- Assessment of any eligible financial assistance available to the processing facilities related to auction revenue generated by the Government under the CPRS.
- Sourcing of data other than data provided by the Plants and data available in the White Paper (e.g. third party forecast data).

This list of excluded specifications for the Model is not comprehensive.

Model format

The Model is a Microsoft Excel workbook which comprises the following sheets:

- 1) Assumptions
- 2) Source data
- 3) Workings
- 4) Results (1 summary sheet and 2 sheets per Plant)

The summary sheet includes one table per Plant, with key results (see Section 3). The other result sheets include graphical representation of the results per plant (CPRS cost impact per head and tHSCW, total CPRS liability per emission sources).

Assumptions

The *Assumptions* sheet includes all assumptions used in the Model in relation to carbon price increases that can be anticipated for the Plants as a result of the CPRS. These assumptions relate to three scenarios only (low, base and high) and are set out in Appendix B.

The 'base' case scenario is the most probable of the 3 scenarios, based on source data used to draft the assumptions, while the 'low' case scenario assumes lower carbon costs for the Plants and the 'high' case scenario assumes higher carbon costs for the Plants. The Model does not address all possible permutations of assumptions other than those set out in these three scenarios.

Source data

The *Source data* sheet includes all greenhouse gas (**GHG**) emissions in tonnes of carbon dioxide equivalent (**tCO₂-e**) and costs per emission sources. This data was provided by the Plants.

Where source data was not available for a Plant, it was extrapolated where relevant based on data from other Plants.

Workings

The CPRS cost impacts are calculated in the Workings sheet.

The total CPRS cost impacts comprise 4 components, described below:

- *Direct Scope 1 CPRS cost impacts*, which represent the cost of purchasing CPRS permits
- *Indirect (i.e. passed through) Scope 1 CPRS cost impacts*, which represent the costs passed through by suppliers of coal, LPG, natural gas and air conditioning/ refrigerant units, as a result of their own liability to purchase CPRS permits
- *Total Scope 2 CPRS cost impact*, which represent the cost passed through by electricity suppliers, as a result of their own liability to purchase CPRS permits
- *Total Scope 3 CPRS cost impact*, which represent the cost passed through by landfill management suppliers, as a result of their own liability to purchase CPRS permits.

1. Direct Scope 1 CPRS cost impacts

- These costs are incurred only by Plants which have annual Scope 1 emissions **in excess of 25kt CO₂-e**.

These Plants would have to purchase CPRS permits for the following Scope 1 emissions only: wastewater treatment and purchase of coal, natural and LPG, if the purchase of these fuels is **in excess of 25kt CO₂-e per fuel**. In this case, the Plants would **not** be charged a carbon cost by the fuel suppliers as they would take on the CPRS permit liability (the White Paper, section 6.6.1).

For example:

- if a Plant purchases 10,000 tCO₂-e of natural gas and generates 10,000 tCO₂-e of wastewater emissions, it does not have to purchase any CPRS permits
 - if a Plant purchases 10,000 tCO₂-e of natural gas and generates 35,000 tCO₂-e of wastewater emissions, it has to purchase 35,000 CPRS permits only
 - if a Plant purchases 26,000 tCO₂-e of natural gas and generates 35,000 tCO₂-e of wastewater emissions, it has to purchase 61,000 CPRS permits.
- Direct permit acquittal obligations will apply to entities with a facility that has scope 1 emissions of 25kt CO₂-e/year (the White Paper Policy, Position 6.2) – for the Plants, these emissions comprise waste water (treated by the Plants). However, all direct emissions (including the ones for which the Plants have not direct liability e.g. diesel – see below) will count towards the facility level threshold (the White Paper, page 6.8).
 - Direct permit acquittal obligations will also apply for the on-site consumption of fossil fuels other than petroleum liquid fuels (coal, natural gas and LPG) and the release of synthetic gases (refrigerants and air conditioning) if the resulting emissions exceed 25tkCO₂-e/ year **per emission source** (the White Paper, page 6.15).
 - The price of permits for each scenario is described in *Assumptions*.

2. Indirect (i.e. passed through) Scope 1 CPRS cost impacts

- Irrespective of the Plants' annual Scope 1 emissions, suppliers of coal, natural and LPG may pass through their own CPRS permit purchase costs to the Plants, if the purchase of these fuels is **below 25kt CO₂-e per fuel**.

For example:

- if a Plant purchases 10,000t CO₂-e of natural gas it does not have to purchase any CPRS permits but the supplier of natural gas does
 - if a Plant purchases 30,000t CO₂-e of natural gas, it has to purchase 30,000 CPRS permits but can purchase natural gas **without** carbon cost pass through (the White Paper, section 6.6.1).
- Direct permit acquittal obligations will apply **to the supplier of the fuel** for the on-site consumption of fossil fuels other than petroleum liquid fuels (coal, natural gas and LPG) and the release of synthetic gases (refrigerants and air conditioning) if the resulting emissions **are below 25tk CO₂-e/ year per emission source** (the White Paper, page 6.15). The Model therefore assumes a cost pass through to the Plants for these emissions (see Assumptions).
 - Scheme obligations for emissions from the domestic combustion of petroleum liquid fuels (petrol and diesel) will be incurred by the upstream suppliers of the fuels. Scheme obligations will be administered on the same basis as fuel tax arrangements (the White Paper, page 6.8).
 - The Australian Government will initially reduce excise and excise-equivalent customs duty (fuel tax) on 1 July 2010 for all fuels currently subject to the general rate of 38.143 cents per litre. The tax cut will be based on the effect of pricing diesel emissions (the White Paper, Policy Position 17.2). All tCO₂-e emissions from petrol and diesel were included in the spreadsheet although no cost pass through was calculated for petrol and diesel (see Assumptions).

3. Total Scope 2 CPRS cost impact

- It is likely there will be a direct electricity cost increase due to the CPRS. This increase has been estimated in the Model at a range of 15% (low case) to 25% (high case), based on modelling outlined in the Australian Government's , *Department of Treasury, Australia's Low Pollution Future, The Economics of Climate Change Mitigation, 2008* (see Assumptions).

4. Total Scope 3 CPRS cost impact

- Direct permit acquittal obligations will apply to landfill facilities (the White Paper, Policy Paper 6.18). The Model therefore assumes a cost pass through to the Plants for the emissions resulting from the disposal of non organic solid waste by the Plants (see Assumptions).

The total CPRS cost impacts is then divided by total number of heads and tHSCW to produce the required metrics.

3 Results

Key results

Based on the Model:

- Plants 1 to 5 have to purchase CPRS permits for their wastewater emissions because their annual Scope 1 emissions exceed 25 ktCO₂-e
- Plant 5 also has to purchase CPRS permits for its annual consumption of coal as it exceeds 25 ktCO₂-e
- All plants will incur a carbon cost pass through for the purchase of fossil fuels and electricity
- Plants 1 and 5 will also incur a carbon cost pass through for the disposal of solid waste to landfill
- Under the **low** case scenario, the total CPRS cost impact per head ranges from \$0.5 (Plant 3) to \$4.6 (Plant 2) and the total CPRS cost impact per tHSCW ranges from \$6 (Plant 6) to \$20 (Plant 3)
- Under the **base** case scenario, the total CPRS cost impact per head ranges from \$0.8 (Plant 3) to \$7.6 (Plant 2) and the total CPRS cost impact per tHSCW ranges from \$9.4 (Plant 6) to \$34.6 (Plant 3)
- Under the **high** case scenario, the total CPRS cost impact per head ranges from \$1.1 (Plant 3) to \$11 (Plant 2) and the total CPRS cost impact per tHSCW ranges from \$13.5 (Plant 6) to \$49.9 (Plant 3).

MLA advises that:

- for most Plants, measurement method 3 as defined in the NGER Act was used to estimate methane emissions from anaerobic ponds, as it believes this method provides the closest estimate of actual emissions from such ponds
- if measurement methods 1 or 2 were used instead, as authorised under the NGER Act, this would likely reduce the emissions from wastewater treatment, which make up a significant portion of the Plants' emissions profile, and would likely reduce the direct Scope 1 CPRS cost impacts for the Plants.

Detailed results

The following tables set out key results from the Model, per Plant, for each of the 3 scenarios described above. The Model includes further detailed results as well as a graphical representation of the results.

Plant 1			
	Low	Base	High
Direct Scope 1 CRPS cost impacts	\$578,625	\$964,375	\$1,350,125
Indirect Scope 1 CPRS cost impacts	\$149,790	\$312,061	\$524,263
Scope 2 CPRS cost impacts	\$214,767	\$286,356	\$357,945
Scope 3 CPRS cost impacts	\$11,343	\$22,685	\$34,028
Total CPRS cost impacts	\$954,524	\$1,585,478	\$2,266,361
<i>Total CPRS cost impact per head</i>	<i>\$3.8</i>	<i>\$6.3</i>	<i>\$8.9</i>
<i>Total CPRS cost impact per tHSCW</i>	<i>\$17.7</i>	<i>\$29.4</i>	<i>\$42.1</i>

Plant 2			
	Low	Base	High
Direct Scope 1 CRPS cost impacts	\$980,790	\$1,634,650	\$2,288,510
Indirect Scope 1 CPRS cost impacts	\$284,855	\$593,448	\$996,992
Scope 2 CPRS cost impacts	\$306,262	\$408,349	\$510,436
Scope 3 CPRS cost impacts	\$0	\$0	\$0
Total CPRS cost impacts	\$1,571,906	\$2,636,446	\$3,795,938
<i>Total CPRS cost impact per head</i>	<i>\$4.6</i>	<i>\$7.6</i>	<i>\$11.0</i>
<i>Total CPRS cost impact per tHSCW</i>	<i>\$16.3</i>	<i>\$27.3</i>	<i>\$39.3</i>

Plant 3			
	Low	Base	High
Direct Scope 1 CRPS cost impacts	\$455,430	\$759,050	\$1,062,670
Indirect Scope 1 CPRS cost impacts	\$175,260	\$365,125	\$613,410
Scope 2 CPRS cost impacts	\$209,305	\$279,073	\$348,842
Scope 3 CPRS cost impacts	\$0	\$0	\$0
Total CPRS cost impacts	\$839,995	\$1,403,248	\$2,024,922
<i>Total CPRS cost impact per head</i>	<i>\$0.5</i>	<i>\$0.8</i>	<i>\$1.1</i>
<i>Total CPRS cost impact per tHSCW</i>	<i>\$20.7</i>	<i>\$34.6</i>	<i>\$49.9</i>

Plant 4			
	Low	Base	High
Direct Scope 1 CRPS cost impacts	\$228,345	\$380,575	\$532,805
Indirect Scope 1 CPRS cost impacts	\$213,587	\$444,973	\$747,554
Scope 2 CPRS cost impacts	\$150,000	\$200,000	\$250,000
Scope 3 CPRS cost impacts	\$0	\$0	\$0
Total CPRS cost impacts	\$591,932	\$1,025,548	\$1,530,359
<i>Total CPRS cost impact per head</i>	<i>\$2.7</i>	<i>\$4.6</i>	<i>\$6.9</i>
<i>Total CPRS cost impact per tHSCW</i>	<i>\$8.1</i>	<i>\$14.1</i>	<i>\$21.0</i>

Plant 5			
	Low	Base	High
Direct Scope 1 CRPS cost impacts	\$1,295,205	\$2,158,675	\$3,022,145
Indirect Scope 1 CPRS cost impacts	\$77,688	\$161,850	\$271,908
Scope 2 CPRS cost impacts	\$507,903	\$677,204	\$846,505
Scope 3 CPRS cost impacts	\$158,913	\$158,913	\$158,913
Total CPRS cost impacts	\$2,039,709	\$3,156,642	\$4,299,471
<i>Total CPRS cost impact per head</i>	<i>\$2.6</i>	<i>\$4.1</i>	<i>\$5.5</i>
<i>Total CPRS cost impact per tHSCW</i>	<i>\$7.8</i>	<i>\$12.1</i>	<i>\$16.4</i>

Plant 6			
	Low	Base	High
Direct Scope 1 CRPS cost impacts	\$0	\$0	\$0
Indirect Scope 1 CPRS cost impacts	\$154,956	\$322,825	\$542,346
Scope 2 CPRS cost impacts	\$332,735	\$443,647	\$554,559
Scope 3 CPRS cost impacts	\$0	\$0	\$0
Total CPRS cost impacts	\$487,691	\$766,472	\$1,096,905
<i>Total CPRS cost impact per head</i>	<i>Irrelevant as breakdown per type of livestock not available</i>		
<i>Total CPRS cost impact per tHSCW</i>	<i>\$6.0</i>	<i>\$9.4</i>	<i>\$13.5</i>

APPENDIX A Glossary of terms

Term	Definition
Carcase	The name given to an animal after it has been slaughtered and dressed
GHG	Greenhouse gas including the six Kyoto greenhouse gases – carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride
Livestock	Animals kept on a farm, and would commonly include sheep, cattle, pigs, goats, deer, alpaca
MLA	Meat and Livestock Australia provides R&D and marketing services to the red meat industry.
NGER Act	National Greenhouse and Energy Reporting Act 2007
Scope 1 emissions	Direct emissions which are produced from sources within the boundary of an organisation and as a result of that organisation's activities
Scope 2 emissions	Energy indirect emissions generated in the wider economy as a consequence of an organisation's purchase and consumption of electricity (or steam or heating/cooling) but which are physically produced by the activities of another organisation
Scope 3 emissions	Indirect emissions generated in the wider economy as a consequence of an organisation's activities but which are physically produced by the activities of another organisation (e.g. disposal of products at municipal landfill, employees commuting to and from work)
tHSCW	Tonnes Hot Standard Carcase Weight

APPENDIX B Key assumptions

#	Assumption	Scenario		
		Low	Base	High
1	Carbon permit (AEU) price	\$ 15	\$ 25 ¹	\$ 35
2	Scope 1 emissions cost pass through (petroleum liquid fuel e.g. diesel, petrol)	0%	0% ²	0%
3	Scope 1 emissions cost pass through (coal, natural gas, LPG and synthetic gases)	80%	100% ³	120%
4	Scope 2 emissions carbon cost pass through (electricity price increase)	15%	20% ⁴	25%
5	Scope 3 cost pass through (waste price increase)	10%	20% ⁵	30%
6	None of the Plants has any farming activities.	Applies to all scenarios		
7	Suppliers of fuel oil, diesel and inbound/outbound transport will not pass through carbon costs downstream between 1 July 2010 and 30 June 2011 due to transitional fuel tax adjustment and assistance to heavy on-road transport industries described in the CPRS (Policy position 17.2)	Applies to all scenarios		
8	All Plants' non-animal derived solid waste goes to externally operated landfills and all greenhouse gases generated on these landfills is released in the atmosphere.	Applies to all scenarios		

Sources for base case scenario assumptions

¹ CPRS White Paper (page xxxi)

² CPRS White Paper: no impact on account of transitional excise relief equivalent to the AEU price (Policy position 17.2)

³ Assumed that suppliers of coal, natural gas, LPG and synthetic gases will seek 100% cost pass through for permit liabilities for the best case, and 120% for the high case (i.e. they will also attempt to pass through their own compliance costs beyond the mere cost of CPRS permit acquittal)

⁴ Department of Treasury, *Australia's Low Pollution Future, The Economics of Climate Change Mitigation, 2008*, Table 6.15

⁵ Transport: see Assumption 7 for transport.

Waste: CPRS White Paper: solid waste disposal covered by the CPRS but threshold and other detailed design issues yet to be determined (see section 6.10) - assumed cost increases for waste in the order of 20%