

APPENDIX E: Priorities for Low Emissions Agricultural Solutions Investment

Appendix E: Summary data from all Sector Technology Assessments (STAs, See Appendix C).

Please refer to Methods in Chapter 3 for the assessment approach and definitions of criteria. Consider caveats and data gaps in Chapters 3 and 6 when interpreting these data. Classifications: L – Low, M- Medium, H- High. See relevant sub-sector STA for description / analysis.

Sub-sector	Technology	Abatement potential (mid-range estimate) - see 'explanations'	Abatement feasible (Lower) kT/year CO ₂ e/year	Abatement feasible (upper) kT/year CO ₂ e/year	Breadth of application	Co-benefits	Barriers	Stacking potential	enabling potential	TRL	CRL	Cost (max) - see 'explanations'	Return (min) - see 'explanations'	Conservative ROI	Archetype	RDC actual \$	RDC category	Level of RDC investment	Industry sub-sector abatement rating	Whole of agriculture abatement rating	Confidence
Dairy	3-Nitrooxypropanol (3-NOP) – rumen methane inhibitor	15%	19	1026	M	M	M	H	L	8	6	\$0.14	\$0.08	-0.06	A7 - Scaling Ready	\$8,917,056	\$5-\$10mill	M	H	M	L
Dairy	Red seaweed (Asparagopsis) and extracts from seaweed as feed additive	11%	32	1816	M	M	M	H	L	7	5	\$1.20	\$0.21	-0.99	A4 - Development trialling	\$7,359,712	\$5-\$10mill	M	H	H	L
Dairy	Synthetic bromoform and various 2nd generation haloform anti-methanogenic feed supplements	11%	32	1816	M	M	H	H	L	3	3	\$0.14	\$0.21	0.07	A2 - Research and Development	\$3,856,970	\$1-\$5mill	L	H	H	L
Dairy	Lipid /fat supplementation	16%	101	169	M	L	M	H	L	9	6	\$1.44	\$1.30	-0.14	A5 - Scaling Constrained	\$843,755	\$500K-\$1mill	L	M	L	M
Dairy	Phytochemicals – Pasture species (e.g. tannin-rich legumes)	18%	32	126	M	M	M	M	L	8	5	\$0.08	\$0.65	0.57	A7 - Scaling Ready	\$0	not in data		M	L	L
Dairy	Phytochemicals – extracts added to diet (e.g., essential oils)	11%	9	368	M	M	M	M	L	8	6	\$0.10	\$0.70	0.60	A7 - Scaling Ready	\$6,054,668	\$5-\$10mill	M	M	L	L
Dairy	Nitrate supplementation	16%	0	50	M	M	H	L	M	8	6	\$0.30	\$0.15	-0.15	A5 - Scaling Constrained	\$0	not in data		L	L	L
Dairy	Garlic and citrus extract	18%	50	396	M	M	M	L	L	8	4	\$0.30	\$0.10	-0.20	A5 - Scaling Constrained	\$0	not in data		M	L	L
Dairy	Ionophore antibiotic	4%	18	267	L	H	L	L	L	6	7	\$0.10	\$0.18	0.08	Labatement/H co-benefit	\$843,755	\$500K-\$1mill	L	M	L	H
Dairy	Probiotic directed molecules	0%	0	0	H	M	H	H	L	5	7	\$0.30	\$0.50	0.20	Unlikely	\$0	not in data		L	L	H
Dairy	anti-methanogen vaccine	15%	0	338	H	L	H	H	L	3	1	\$0.05	\$0.10	0.05	A2 - Research and Development	\$0	not in data		M	L	L
Dairy	Early life rumen programming	5%	0	51	M	M	L	H	L	4	2	\$1.00	\$0.10	-0.90	A2 - Research and Development	\$0	not in data		L	L	L
Dairy	Selective breeding for L methane	8%	101	451	H	L	M	H	L	6	5	\$0.05	\$0.05	0.00	A4 - Development trialling	\$38,465,762	\$30-\$40mill	H	M	L	L
Dairy	Optimised N fertilizer-use on pasture	54%	30	245	H	H	L	H	L	9	7	\$0.20	\$0.23	0.03	A7 - Scaling Ready	\$0	not in data		M	L	L

APPENDIX E: Priorities for Low Emissions Agricultural Solutions Investment

Dairy	Urine patch inhibitors (spray)	35%	0	128	L	L	H	H	L	7	5	\$0.10	\$0.00	-0.10	A4 - Development trialling	\$0	not in data		M	L	L
Dairy	Nitrification inhibitors	25%	40	320	H	H	M	H	M	9	7	\$0.08	\$0.00	-0.08	A7 - Scaling Ready	\$2,012,500	\$1-\$5mill	L	M	L	L
Dairy	Urease inhibitors	13%	8	41	M	M	M	H	M	9	7	\$0.03	\$0.00	-0.03	A7 - Scaling Ready	\$2,012,500	\$1-\$5mill	L	L	L	L
Dairy	On-off grazing (stand-off pads)	53%	0	3	L	L	M	H	M	9	5	\$0.20	\$0.00	-0.20	A5 - Scaling Constrained	\$0	not in data		L	L	L
Dairy	Covered anaerobic lagoons and anaerobic digesters (biogas capture)	86%	0	34	L	M	L	H	L	9	5	\$2.30	\$0.23	-2.07	A5 - Scaling Constrained	\$0	not in data		L	L	L
Dairy	Effluent solid separation (flocculation)	40%	0	13	M	M	H	H	L	7	2	\$0.03	\$0.01	-0.02	A4 - Development trialling	\$0	not in data		L	L	L
Dairy	Manure slurry acidification	54%	45	238	H	L	M	H	L	9	5	\$0.14	\$0.03	-0.11	A5 - Scaling Constrained	\$0	not in data		M	L	L
Dairy	Biochar feed supplementation	0%	0	0	L	L	H	L	L	7	2	\$0.27	\$0.00	-0.27	Unlikely	\$0	not in data		L	L	L
Dairy	L-emission farm machinery	40%	1	103	H	L	M	H	M	9	2	\$0.45	\$0.04	-0.41	A5 - Scaling Constrained	\$0	not in data		M	L	L
Livestock	3-Nitrooxypropanol (3-NOP) – rumen methane inhibitor	23%	6	336	M	M	M	H	L	8	6	\$0.14	\$0.02	-0.12	A7 - Scaling Ready	\$8,917,056	\$5-\$10mill	M	L	L	L
Livestock	Red seaweed (Asparagopsis) and extracts from seaweed as feed additive	49%	11	594	M	M	M	H	L	7	5	\$1.20	\$0.40	-0.80	A4 - Development trialling	\$7,359,712	\$5-\$10mill	M	M	L	L
Livestock	Synthetic bromoform and various 2nd generation haloform anti-methanogenic feed supplements	50%	11	594	M	M	H	H	L	3	3	\$0.14	\$0.40	0.26	A2 - Research and Development	\$3,856,970	\$1-\$5mill	L	M	L	L
Livestock	Lipid /fat supplementation	15%	71	236	M	M	M	H	L	9	6	\$0.60	\$0.35	-0.25	A7 - Scaling Ready	\$843,755	\$500K-\$1mill	L	L	L	L
Livestock	Phytochemicals – Pasture species (e.g. tannin-rich legumes)	11%	288	1120	M	M	M	M	M	8	5	\$0.06	\$0.10	0.04	A7 - Scaling Ready	\$21,550,000	\$20-\$30mill	H	M	M	L
Livestock	Phytochemicals – extracts added to diet (e.g., essential oils)	11%	3	121	M	L	M	M	L	8	6	\$0.10	\$0.14	0.04	A7 - Scaling Ready	\$6,054,668	\$5-\$10mill	M	L	L	L
Livestock	Nitrate supplementation in feed	16%	17	62	M	M	H	L	M	8	6	\$0.30	\$0.15	-0.15	A6 - Scaling Limited	\$0	not in data	M	L	L	L
Livestock	Garlic & citrus extract (e.g. Mootral)	18%	4	198	L	L	H	L	L	7	4	\$0.40	\$0.05	-0.35	A4 - Development trialling	\$0	not in data	M	L	L	L
Livestock	Ionophore antibiotic (Monensin)	4%	2	64	L	M	H	L	L	6	7	\$0.10	\$0.17	0.07	Unlikely	\$843,755	\$500K-\$1mill	L	L	L	H
Livestock	Probiotics & directed microbials	0%	0	0	M	H	H	H	M	5	7	\$0.30	\$1.40	1.10	L abatement/H co-benefit	\$978,864	\$500K-\$1mill	L	L	L	H
Livestock	Anti-methanogen vaccine (in development)	15%	0	3000	H	L	H	H	L	3	1	\$0.05	\$0.10	0.05	A2 - Research and Development	\$0	not in data		M	H	L
Livestock	Early-life rumen programming	13%	3	97	M	M	H	H	L	5	2	\$0.15	\$0.05	-0.10	A3- Development early	\$0	not in data		L	L	L
Livestock	Selective breeding for L methane	8%	900	4000	H	L	M	H	L	7	5	\$0.05	\$0.00	-0.05	A4 - Development trialling	\$38,465,762	\$30-\$40mill	H	M	H	L
Livestock	Covered anaerobic lagoons and anaerobic digesters (biogas capture)	86%	26	65	L	M	L	H	L	9	5	\$0.07	\$0.08	0.00	A6 - Scaling Limited	\$0	not in data		L	L	L

APPENDIX E: Priorities for Low Emissions Agricultural Solutions Investment

Livestock	Biochar feed supplementation	0%	0	0	L	L	L	H	L	7	2	\$ 0.14	\$0.00	-0.14	Unlikely	\$0	not in data		L	L	H
Livestock	L-emission farm machinery	0%	0	0	H	L	M	H	L	9	4	\$0.45	\$0.04	-0.41	Unlikely	\$0	not in data		L	L	L
Livestock	Grape marc	0%	0	0	L	L	L	M	L	6	3	\$0.20	\$0.00	-0.20	Unlikely	\$0	not in data	L	L	L	H
Livestock	Herd management	40%	6	882	H	H	M	H	M	9	4	\$0.01	\$0.14	0.12	A7 - Scaling Ready	\$0	not in data		M	M	L
Cropping	SL-/Controlled-release nitrogen fertilisers	25%	37	394	M	M	H	H	M	8	6	\$120.00	\$0.00	-120.00	A5 - Scaling Constrained	\$2,123,500	\$1-\$5mill	L	M	L	L
Cropping	Nitrification inhibitors	70%	443	1312	H	H	M	H	M	9	7	\$60.00	\$0.00	-60.00	A5 - Scaling Constrained	\$2,012,500	\$1-\$5mill	L	H	M	M
Cropping	Urease inhibitors	8%	31	131	M	M	M	H	M	9	7	\$25.00	\$0.00	-25.00	A7 - Scaling Ready	\$2,012,500	\$1-\$5mill	L	M	L	L
Cropping	Reduced Tillage	22%	14	45	H	H	M	H	H	9	6	\$30.00	\$40.00	10.00	A7 - Scaling Ready	\$0	not in data		L	L	L
Cropping	Precision Nitrogen Applications	0%	-23	61	H	H	M	H	H	8	5	\$80.00	\$7.00	-73.00	L abatement/H co-benefit	\$23,051,449	\$20-\$30mill	H	L	L	L
Cropping	Controlled Traffic Farming	25%	137	410	H	H	M	H	H	9	5	\$40.00	\$57.00	17.00	A7 - Scaling Ready	\$0	not in data		M	L	M
Cropping	Lime Application Management	-6%	-8	-27	H	H	M	H	M	9	6	\$80.00	\$100.00	20.00	L abatement/H co-benefit	\$0	not in data		L	L	L
Cropping	Legume Integration	20%	-11	456	M	H	M	H	M	9	5	\$80.00	\$50.00	-30.00	A7 - Scaling Ready	\$2,750,000	\$1-\$5mill	L	M	L	L
Cropping	Cover/Catch Cropping	2%	1	8	M	H	M	H	L	7	3	\$90.00	\$60.00	-30.00	L abatement/H co-benefit	\$0	not in data		L	L	L
Cropping	Arbuscular Mycorrhizal Fungi Inoculation	15%	13	220	M	H	M	M	M	6	3	\$60.00	\$30.00	-30.00	A4 - Development trialling	\$61,500	less than \$100K	L	M	L	L
Cropping	Biochar Application	25%	1	16	M	H	H	H	M	7	3	\$2,000.00	\$600.00	-1,400.00	A4 - Development trialling	\$0	not in data		L	L	L
Cropping	Stubble Retention	3%	0	0	H	H	M	H	M	9	6	\$20.00	\$20.00	0.00	L abatement/H co-benefit	\$4,200,000	\$1-\$5mill	L	L	L	L
Cropping	Electric Farm Machinery	100 %	240	720	M	H	H	H	M	8	4	\$400.00	\$100.00	-300.00	A5 - Scaling Constrained	\$0	not in data		M	L	M
Cropping	Alternate Fuels	99%	238	713	H	H	M	H	M	9	4	\$1,000.00	\$150.00	-850.00	A5 - Scaling Constrained	\$0	not in data		M	L	M
Cropping	Nitrogen-Fixing Crops (non-legumes)	28%	2	1661	H	H	H	H	M	4	2			0.00	A2 - Research and Development	\$0	not in data		H	H	L
Cropping	Biological Nitrification Inhibition Crops	30%	148	738	M	M	H	H	M	4	2	\$5.00	\$50.00	45.00	A2 - Research and Development	\$270,000	\$100K-\$500K	L	M	L	L
Cropping	Green Cane Harvesting	75%	4	10	H	H	L	H	M	9	6	\$101.00	\$116.00	15.00	A7 - Scaling Ready	\$0	not in data		L	L	M
Horticulture	Electrification of Farm Machinery (and Alternative Fuels)	100 %	101	168	H	H	H	H	M	7	5	150000	100	-149,900.00	A4 - Development trialling	\$3,220,000	\$1-5mill	L	M	L	M
Horticulture	Precision Agriculture	30%	25	100	M	H	M	H	H	9	6	35000	6	-34,994.00	A5 - Scaling Constrained	\$589,389	\$500K-\$1mill	L	L	L	L
Horticulture	Nitrification inhibitors	50%	15	86	M	M	H	H	M	9	7	149	93	-56.00	A5 - Scaling Constrained	\$2,012,500	\$1-\$5mill	L	L	L	L
Horticulture	Controlled and sL release fertilisers	35%	0	10	M	H	M	H	M	9	6			0.00	A7 - Scaling Ready	\$0	not in data		L	L	L
Horticulture	Cover Cropping (Non legume Covers)	28%	0	8	M	H	M	H	H	9	6			0.00	A7 - Scaling Ready	\$0	not in data		L	L	L
Horticulture	Urease inhibitors	10%	6	27	M	M	H	H	M	9	6	20	12	-8.00	A6 - Scaling Limited	\$2,012,500	\$1-\$5mill	L	L	L	L
Horticulture	Soil Microbial Inoculants	35%	5	18	M	H	H	H	L	9	5	198		-198.00	A5 - Scaling Constrained	\$0	not in data		L	L	L
Pig farming	Covered anaerobic lagoons (CAL) (biogas capture)	71%	278	462	M	H	M	H	L	9	4	\$2,500,000.00	\$416,666.67	-2,083,333.33	A5 - Scaling Constrained	\$0	not in data		M	L	M

APPENDIX E: Priorities for Low Emissions Agricultural Solutions Investment

Pig farming	Effluent solid separation (flocculation)	23%	74	118	M	H	M	H	M	8	7	\$605,000.00	\$50,000.00	-555,000.00	A5 - Scaling Constrained	\$0	not in data		M	L	M
Pig farming	Short Hydraulic Retention Time (HRT)	79%	51	106	M	H	M	H	L	9	3	\$1,380,000.00	\$50,000.00	-1,330,000.00	A5 - Scaling Constrained	\$49,250	less than \$100K	L	L	L	M
Pig farming	Minimum solids stockpiling	20%	13	92	M	H	M	M	L	9	6	\$450,000.00	\$50,000.00	-400,000.00	A5 - Scaling Constrained	\$0	not in data		L	L	L
Pig farming	Manure slurry acidification	40%	0	3	L	H	M	H	M	9	8	\$302,500.00	\$25,000.00	-277,500.00	A5 - Scaling Constrained	\$0	not in data		L	L	L
Pig farming	Deep litter housing	55%	42	106	M	H	M	H	M	9	9	\$6,062,500.00	\$50,000.00	-6,012,500.00	A5 - Scaling Constrained	\$0	not in data		L	L	M
Pig farming	L-protein diet (amino acid supplementation)	29%	39	96	M	H	M	H	M	9	8	\$50,000.00	\$205,000.00	155,000.00	A7 - Scaling Ready	\$0	not in data		L	L	M
Pig farming	Probiotic and plant-based feed additives	10%	5	28	M	H	M	M	M	9	8	\$205,000.00	\$61,500.00	-143,500.00	A7 - Scaling Ready	\$0	not in data		L	L	L
Pig farming	Dietary organic acids	10%	5	28	M	H	M	H	L	9	8	\$153,750.00	\$51,250.00	-102,500.00	A7 - Scaling Ready	\$0	not in data		L	L	L
Pig farming	Pig breeding programs	10%	57	230	H	H	M	H	H	9	9	\$153,750.00	\$307,500.00	153,750.00	A7 - Scaling Ready	\$0	not in data		M	L	L
Poultry	Methane capture and utilisation	75%	0	5	L	H	H	H	M	8	4	\$8,000,000.00	\$500,000.00	-7,500,000.00	A5 - Scaling Constrained	\$0	not in data		M	L	L
Poultry	Gasification and pyrolysis	83%	1	8	L	H	H	H	H	6	3	\$10,000,000.00	\$500,000.00	-9,500,000.00	A4 - Development trialling	\$0	not in data		M	L	L
Poultry	Combustion of litter	75%	2	21	L	H	H	H	M	8	5	\$10,000,000.00	\$5,000,000.00	-5,000,000.00	A5 - Scaling Constrained	\$0	not in data		M	L	L
Poultry	Covered stockpiles	50%	10	76	H	H	M	H	M	9	8	\$100,000.00	\$0.00	-100,000.00	A5 - Scaling Constrained	\$0	not in data		H	L	L
Poultry	Shed litter management	20%	2	7	H	H	M	H	M	9	9	\$450,000.00	\$450,000.00	0.00	A7 - Scaling Ready	\$0	not in data		M	L	L
Poultry	Feed additives	18%	3	26	H	H	M	H	M	9	9	\$500,000.00	\$500,000.00	0.00	A7 - Scaling Ready	\$0	not in data		M	L	L
Poultry	Precision feeding	18%	2	21	H	H	M	H	H	8	4	\$700,000.00	\$700,000.00	0.00	A7 - Scaling Ready	\$0	not in data		M	L	L
Poultry	Poultry breeding programs	10%	5	20	H	H	M	H	H	9	9	\$0.00	\$225,000.00	225,000.00	A7 - Scaling Ready	\$0	not in data		M	L	L