THE IMPACT OF ENERGY COSTS ON THE AUSTRALIAN AGRICULTURE SECTOR

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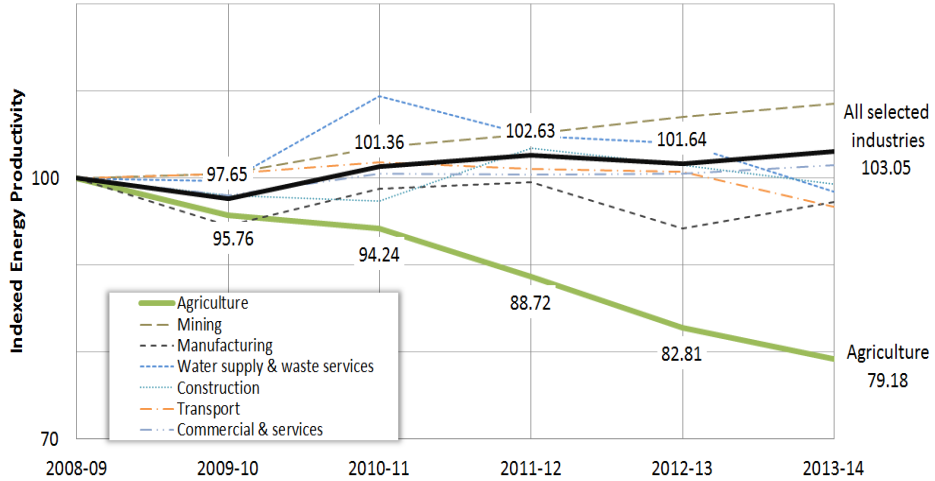

Figure 1. Indexed energy productivity performance of industry (Source: Agriculture Industry Energy Taskforce, 2017)

OVERVIEW

- Cost of energy as a proportion of production cost in Australian agriculture has significantly increased - up to 100% in the past five years, rising on average by 35% in the past two years alone
  - And as production systems intensify, dependence on energy inputs is likely to increase
- Significant increases in energy costs have serious implications for the future competitiveness of Australian agriculture
- Efficiency gains from recent initiatives are being offset or overtaken by energy costs increases – ag energy productivity has declined by more than 21% since 2008 *(see graph)*
- Understanding energy use and costs across agriculture is essential for assessing both the current impacts of energy price rises on the viability of businesses and the future state of the sector

Project: ***The impacts of energy costs on the Australian agriculture sector*** *– funded by ECA*

RESEARCH METHODS

- **Literature review**
- **Sub-sector analysis**
- **Gap analysis**
- **Energy Cost Calculator**
- **Case studies**
- **Results and conclusion**

This research covered the impact of energy costs on 11 major agricultural commodity sectors

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Beef		
Feed (manufactured)	**Units**	
Total feed use	t	3,543,329
Electricity		
Average electricity use	kWh/t	27.9
Total electricity cost	$	32,623,430
Total cost at modelled price	$	42,410,459
Gas		
Average gas use (LPG+ nat gas)	GJ/t	0.22
Total gas cost	$	3,063,562
Total cost at modelled price	$	3,216,740
Crop and pasture chemicals		
Average cost per farm	$	2,752
Total cost	$	88,724,480
Total energy required	MJ	59,445,402
	GJ	59,445
Total electricity use	**GJ**	16,645
	kWh	4,627,230
Total electricity cost	$	1,526,986
Total cost at modelled price	$	1,985,082
Total gas (nat gas) use	**GJ**	23,778
Total gas cost	$	261,560
Total cost at modelled price	$	274,638
Fertiliser		
Average cost per farm	$	9,475
Total fertiliser cost	$	305,474,000
Estimated fertiliser use	t	763,685
Total energy use	GJ	8,196,886
Total energy cost	$	90,165,742
Total cost at modelled price	$	94,674,029
Livestock materials (drenches, dips etc)		
Average cost per farm	$	7,807
Total cost	$	251,697,680
Total energy required	MJ	168,637,446
	GJ	168,637
Total electricity use	**GJ**	47,218
	kWh	13,126,739
Total electricity cost	$	4,331,824
Total cost at modelled price	$	5,631,371
Total gas (nat gas) use	**GJ**	67,455
Total gas cost	$	742,005
Total cost at modelled price	$	779,105
TOTAL ENERGY COSTS FOR INPUTS		
Pre- price change	$	**132,715,109**
Post- price change	$	**148,971,424**
ENERGY COST IMPACT	**$**	**16,256,315**

Total Cost of Energy for Sectors and Value Chain Segments ($millions)				
Sector	Value Chain Segment	Electricity	Gas*	Diesel**
Grains	Input	21.8	330.4	
	Production	46.6		563.4
	Transport			534.3
	Processing	87.5	8.2	
Beef	Input	38.5	94.2	
	Production	89.7		431.6
	Transport			150.1
	Processing	449.6	76.5	5.9
Sheep	Input	8.3	86.3	
	Production	60.7		220.8
	Transport			55.1
	Processing			
Horticulture	Input	2.4	6.0	
	Production	88.8	120.3	
	Transport			101.4
	Processing			
Dairy	Input	30.3	71.7	
	Production	142.8		
	Transport			219.1
	Processing	106.6	20.6	
Chicken Meat	Input	29.2	2.7	
	Production	346.7	39.5	10.1
	Transport			7.0
	Processing	159.9	10.1	2.7
Cotton	Input	2.8	40.3	
	Production	19.5		110.3
	Transport			22.4
	Processing	72.6	1.7	
Sugar	Input	.01	38.1	
	Production	175.2	22.8	
	Transport			15.5
	Processing			
Pork	Input	13.4	1.3	
	Production	102.1	1.0	3.7
	Transport			7.2
	Processing	34.3	7.4	.4
Wine	Input		8.3	
	Production	85.8		41.0
	Transport			
	Processing	69.3		
Eggs	Input	8.4	.8	
	Production	59.9	1.6	.7
	Transport			
	Processing			
Total		2352.6	989.9	2502.8

* Includes all gas types
** Includes diesel, petrol and oil

ENERGY COST CALCULATOR

This tool was developed to quantify the impact of energy costs on the Australian agricultural sector:

- **Base analysis**
  - Using standard set of energy prices
- **Modelling**
  - 30% increase in electricity price
  - 5% increase in all other energy source pricing

NOTE: The report and Energy Cost Calculator will be available at www.farminstitute.org.au **from 22 Aug 2018**

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RESULTS – SUMMARY BASE COSTS OF ENERGY

SECTOR	Baseline cost ($million)	Modelled cost ($million)	Cost impact ($million)
Grains	1,592	1,694	102
Beef*	1,336	1,547	211
Chicken meat	608	772	164
Dairy	591	690	98
Sheep	431	470	39
Horticulture (vegetables)	319	358	39
Cotton	270	307	37
Sugar	252	308	56
Wine & Grapes	204	253	49
Pork	171	217	46
Eggs	71	92	21
TOTAL	**5,845**	**6,708**	**863**

*** Includes sheepmeat processing**

Base cost p/a of energy to ag:

$5.8B

Modelled cost increases*:

30% elec.

5% all others

Modelled cost impact p/a

$863M

*NB: modelled cost increases are considered conservative in the current climate

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RESULTS – COMPARISON OF ENERGY COSTS TO GVP

SECTOR	Energy costs ($million)	Sector value GVP** ($million)	Energy costs as a proportion of GVP
Chicken Meat	435	2,729	16%
Sugar	252	1,622	16%
Wine grapes	135	1,040	13%
Dairy	464	3,687	13%
Cotton	195	1,934	10%
Pork	129	1,342	10%
Eggs	71	808	9%
Grains	1,496	16,972	9%
Horticulture (vegetables)	319	3,904	8%
Beef	804	12,139	7%
Sheep	431	7,367	6%
TOTAL	**4,732**	**53,544**	**9%**

***Excludes processing costs**
****Source: ABARES Agricultural commodities & trade data 2016/17**

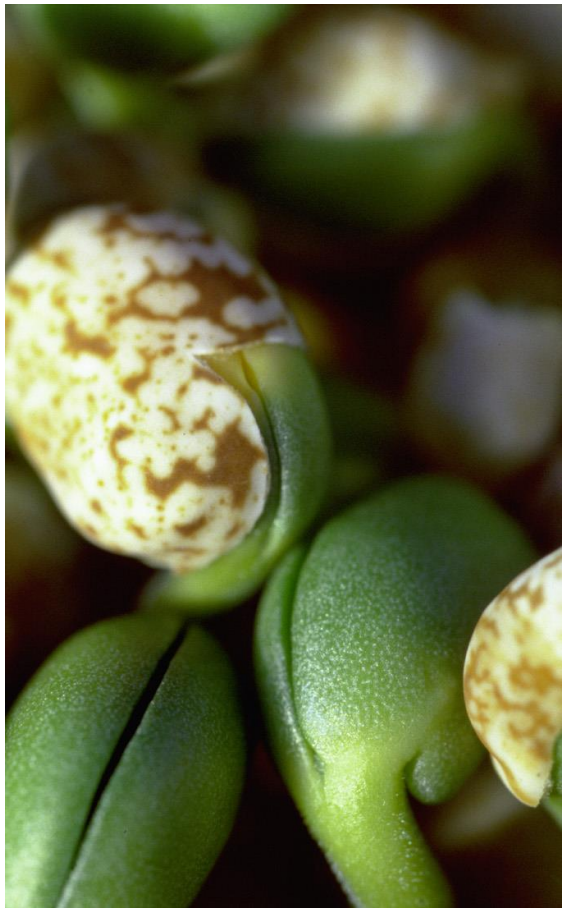
Cost p/a of energy ex. processing:
$4.7B

Sector value GVP
$53.5B

Energy costs as a proportion of GVP
9%

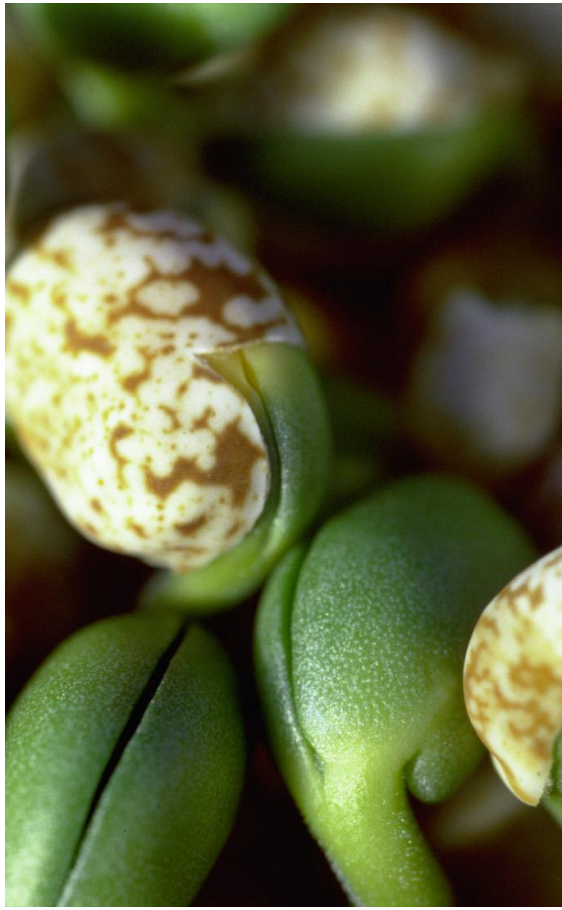
KEY FINDINGS 1/2

- Energy use/pricing **data was lacking and inconsistent**
  - Industry needs improved collection, management and reporting of energy use data and information
- The ability of Australian agricultural businesses to remain globally competitive will be heavily dependent on the proportionate cost of energy
- Poor sectoral engagement re: energy issues
  - Solutions to address rising energy costs are siloed
  - Collective approach to ag energy strategy needed



KEY FINDINGS 2/2

- Energy efficiency gains are increasingly offset by rising energy prices
  - But efficiency measures are practical solutions and have been effective for individual businesses
- Strong evidence for further research to describe relationship between **energy costs and energy sources**
- **Policy change** is the best option to address rising energy costs (not efficiency measure alone)
  - Cross-industry efforts required to drive long-term policy change



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THANK YOU

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