Bioenergy Australia 2016

BIOGAS IN THE CIRCULAR ECONOMY

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IEA Bioenergy Task 37


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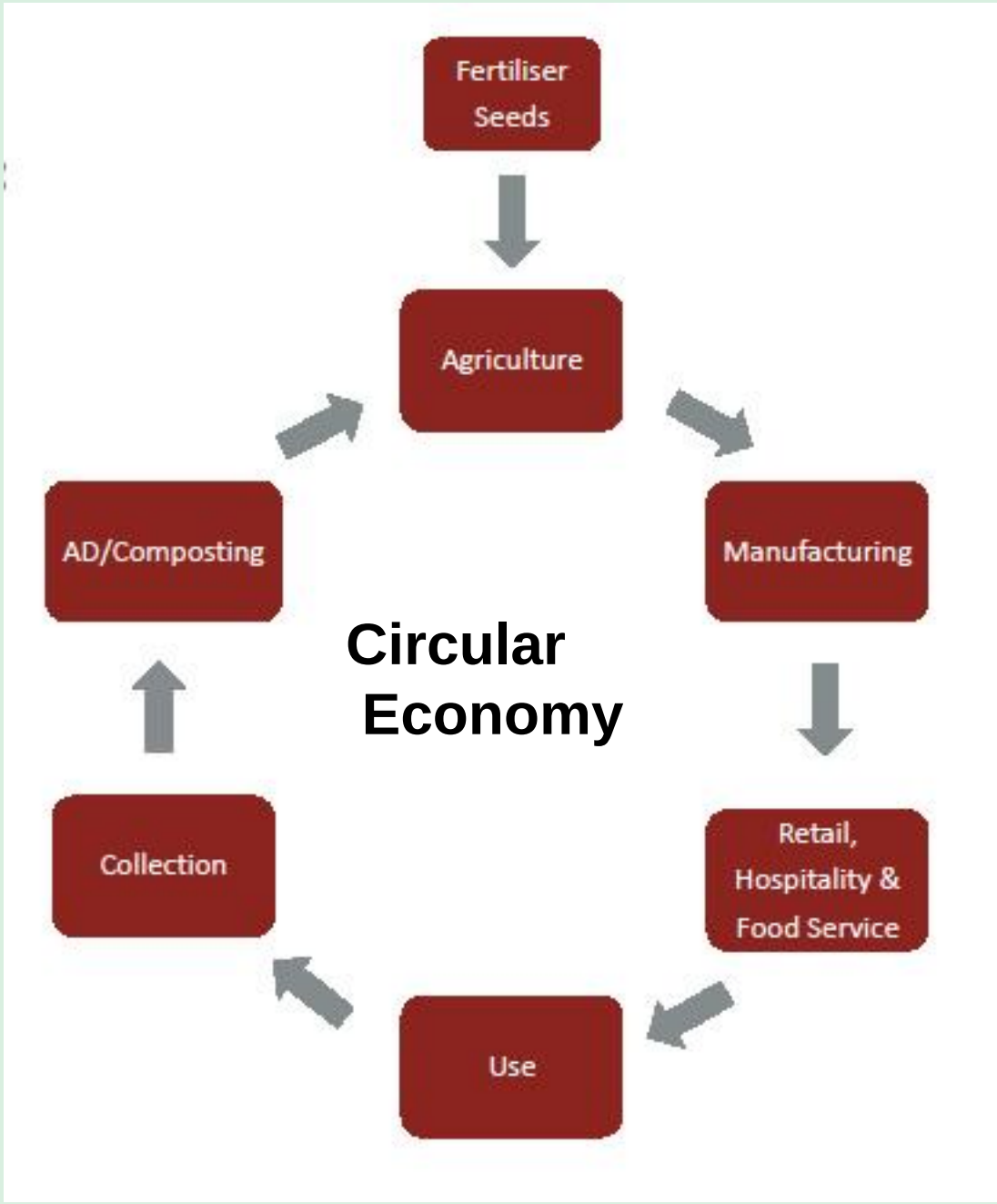
Source: WRAP


Fertiliser
Seeds
Agriculture
Manufacturing
Retail, Hospitality & Food Service
Use
Collection
AD/Composting
Circular Economy

Access and financial security

Impact:
Production, processing and storage facilities, fertiliser costs

Supply interruptions

Weather

Mechanical breakdown

Political instability

Price fluctuations

Impact:
Budget planning, maintenance of delivery schedules, retention of customer orders

Alternatives to deliver regular supply

A place for Biogas/AD

Total self sufficiency and large surplus for sale

On farm to reduce dependence on national grid

Biogas in policy

- Purposes:
- Waste management
- Wastewater treatment
- Electricity and gas production

***DISPOSAL* OF DIGESTATE**

AD undervalued process

The circular process at work

Reproduced by courtesy of Wyke Farms

Milk from own herds of 1500 cows and 80 milk supply farms in 50 mile radius .

Feedstock

75,000Slurry, whey +chopped OSR straw, maize silage, apple pomice & bread to double in 2017

To open March 2017

Construction of 2 new digesters to double output. All gas exported to third parties. Potential for milk and biomethane delivery vehicles

Source:Courtesy of Wyke farms

13,000 tonnes cheese

Circulated output CHP

1x 500 kWe /heat to cheese processing plant & 1 x 500 kWe at digester site for process heat & pasteurise digestate; Electric power for on site use and run delivery vans

Surplus gas upgraded and fed into national grid

Gorge Farm- Lake Naivasha Kenya a working model of a circular economy

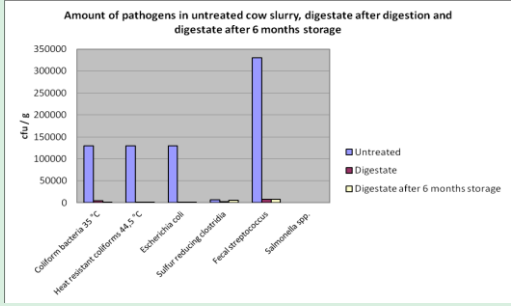
Distributed power vital for energy security, reliability and efficiency; guarantee for export targets. Replaced grid electricity for farm & community, diesel for heating glasshouses, fertiliser for community and commercial farms

Horticulture 1bn US$ pa
1986 11,000t – 2015 122,600 t

40% crops misfits for packaging and aesthetics

Source: Courtesy of Clarke Energy

-Financial benefits (Euros)



Financial benefit	Stage 1 1998-2001	Stage 2 2002-2007	Stage 3 2008-2011	Comments
Avoided expenditure: Electricity	7,000	10,000	13,000	Combined effect of electricity price increase and increase farm consumption Includes heat from the CHP and boiler
Heat	15,000-18,000	18,000-20,000	18,000-20,000	
Car fuel	2,000	2,000	6,000	
Tractor fuel	0	0	Circa 1,000	
Artificial fertiliser replacement	5,00O-6,000	5,000-6,000	5,000-6,000	
Reduced expenditure on veterinary bills	Not quantified	Not quantified	Not quantified	
Sub-total avoided expenditure (a)	*29,000-35,000*	*35,000 -38,000*	*43,000 -46,000*	
New income sources: Electricity export	0	0	0	
Heat	0	0	0	
Biomethane for vehicle fuel	0	12,000	90,000	
Extra litres of milk	Not quantifiable	Not quantifiable	Not quantifiable	
Gate fees	0	0	5,000	
Sub-total new income (b)	*0*	*12,000*	95,000	
Total financial benefit (a) + (b)	**29,000-35,000**	**47,000-50,000**	**138,000-141,000**	

Biogas & AD - the pivot of the circular economy

- Optimum use of resources – little waste
- Energy –reduced power distribution losses
- - need for road transport of oil, etc
- Fertiliser – demand on primary sources (NPK) & retention and recycling of nutrients, increase in NH_4 N
- Animal & plant health - antibiotics, pest & herbicides
- Human health – flies, odours, bacteria & viral circulations
- On site recirculation of resources-surplus for sale

Leads to increased productivity

Reduced GHG emissions

Cushion against global crises (eg oil)

Financial stability

THE CASE FOR GLOBAL ADOPTION OF AD

A

HIGHLY FLEXIBLE PROCESS

ACKNOWLEDGEMENTS

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