



# INTRODUCTION BUSINESS CASE FOR ENERGY EFFICIENT EQUIPMENT TOOLKIT

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Supporting Partners:  **Australian Government**  
Department of Industry



**Government of South Australia**  
Zero Waste SA

# What's this presentation about

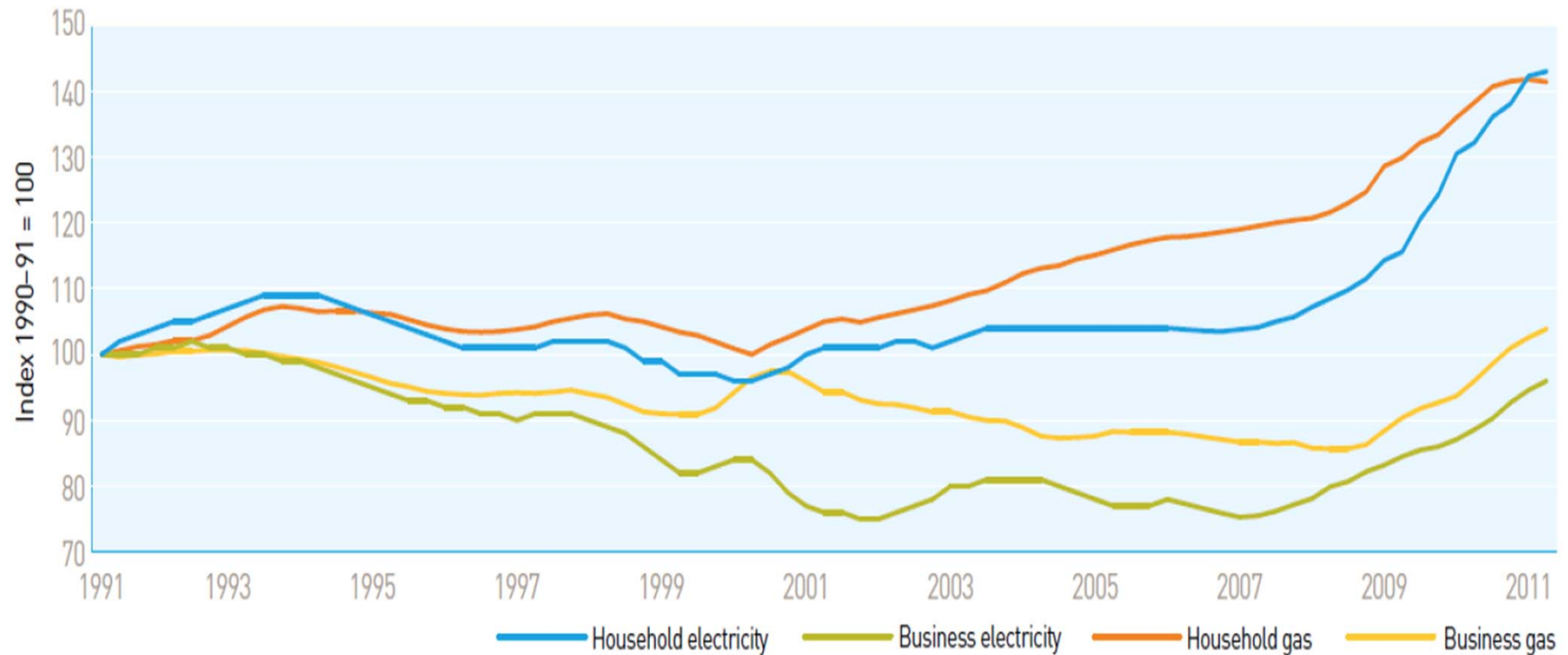
Overview of the Food SA *Business Case for Energy Efficient Equipment* Program, in particular:

- What was delivered to the industry
- What was gained by the industry
- Challenges and lessons learned
- Future directions

Acknowledgement:

*This Activity received funding from the Department of Industry as part of the Energy Efficiency Information Grants Program. The views expressed herein are not necessarily the views of the Commonwealth of Australia, and the Commonwealth does not accept responsibility for any information or advice contained herein.*

# Why 'energy efficiency'?



# Being realistic about energy efficiency



# Being realistic about energy efficiency

- Sales & productivity are the biggest priorities → energy efficiency is about reducing costs...
- Refrigeration and/or heating/cooking are typically the biggest users → driven by production...what can be done depends on the size of the operation
- What works for one business may not work for another
- But...‘50 bucks is 50 bucks’ → efficiency is a mindset

# What does a food business gain from energy efficiency?

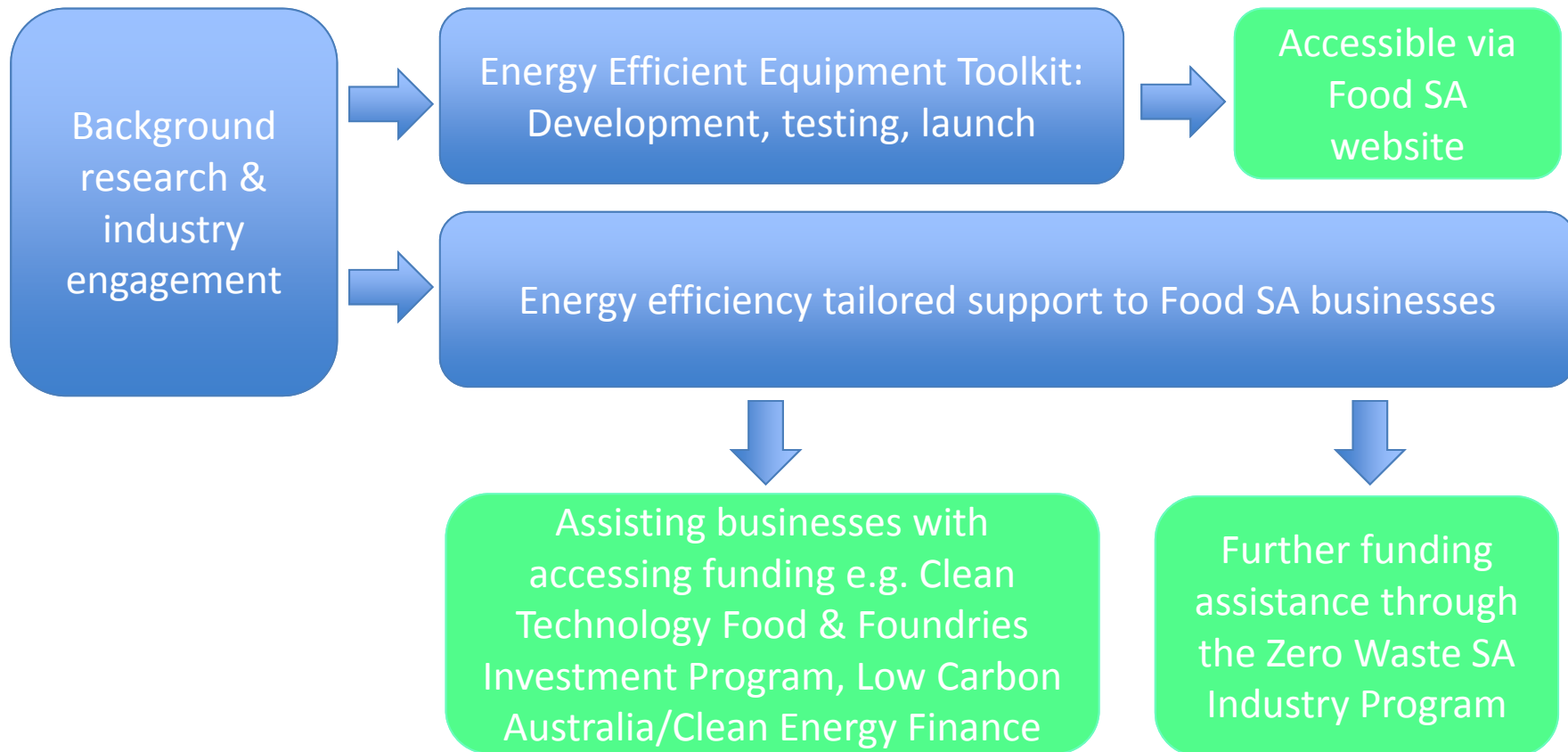
- Cost savings associated with energy consumption
- Reducing maintenance costs and downtime
- Reduced costs associated with water, materials and waste consumption
- Improved productivity
- Delayed need for capital expenditure
- Enhanced brand and company profile

These additional benefits are often much bigger than the \$\$ saved in energy.... (high energy consumption can be considered a symptom of a system not working properly!)

# Big opportunities for energy efficiency in the SA food industry

TECHNOLOGY AREA	DESCRIPTION	PROPORTION OF ENERGY CONSUMPTION IN SME FOOD BUSINESS
1 Refrigeration and chilling	Equipment used for product chilling and cold storage (refrigeration systems)	30-80%
2 Cooking and heating	Equipment used for product cooking, baking and pasteurisation	10-50%
3 Steam and hot water	Equipment required for the generation and distribution of steam and hot water to manufacturing processes and for cleaning	10-30%
4 Pumping	Equipment required for the transfer for water and other fluids throughout the manufacturing process, which form a component of most machinery	10-30%
5 Compressed Air	Equipment required to supply compressed air to manufacturing processes and for cleaning	5-20%
6 Heating, Ventilation and Air Conditioning (HVAC)	Systems installed within the manufacturing building to manage indoor air temperature and ventilation	5-15%
7 Lighting	Systems installed to provide adequate lighting to the manufacturing facility	5-15%

# Business Case for Energy Efficient Equipment: Program Overview







# Tailored support to Food SA businesses

- Free support to assist with identification, assessment and implementation of energy efficiency opportunities (+ assistance with funding applications)
- Offered to the SA food industry (preference given to Food SA members)
- Focused primarily on small and medium-sized businesses (those that needed it most!)
- Originally planned to offer support for up to 10 companies.....
- ....expanded the support to accommodate 30 businesses

# Tailored support to Food SA businesses

Some brief stats:

- BCEEE Federal Grant received by Food SA: \$187,600 (+ funding from Zero Waste SA)
- \$\$ in (estimated) energy cost savings identified through one-on-one support: \$900,000 p/a
- \$\$ in grant funding attracted: \$3.94m
- \$\$ invested by business: \$7.18m
- Electricity savings: 3,159 MWh p/a
- Gas savings: 132,171 GJ p/a
- CO2 savings: 10,397 tCO2-e p/a



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# Case Study: Golden North Ice Cream

## Challenges

- Shifting production set-up from high-volume, low-margin products to higher-margin 'impulse' product range
- Rising cost of doing business – materials (milk), electricity, gas, labour, refrigerants
- Power constraints with existing transformer & flow-on effects to the community (brown-outs)
- Equipment becoming increasingly unreliable



## Energy efficiency opportunities investigated

- Replacement of multiple, inefficient compressors with the installation of one single screw compressor
- Use of variable speed drives to allow a more efficient use of the compressor.
- Installation of water heat exchangers for oil cooling, resulting in a significant improvement in the full-load compressor efficiency.
- The installation of variable speed fans to control the condenser's discharge pressure.

# Case Study: Golden North Ice Cream

## Results & benefits

- Annual energy savings of 641,000 kWh → \$127,700 p/a
- Significant productivity improvements → reducing hardening time of ice-cream by over 50%
- Increased compressor plant capacity by 43%
- Reduced maintenance costs
- Delayed the need to increasing transformer capacity

Golden North were successful in receiving funding for the \$895,000 project:

- \$447,500 from the Clean Tech Food & Foundries Program (grant)
- \$447,500 from Clean Energy Finance Corporation (low-interest finance)

*“These refrigeration upgrades are expected to half the time it takes to harden ice cream, and allow us to increase out production capacity. This will enable us to pursue new business opportunities, and help us create more local jobs.” Peter Adamo, GM*



# Thomas Foods International

## Challenges

- Lobethal site is one of the top five meat processing operations in Australia (production capacity of 5,000 heads of lamb per day)
- Keeping costs low to remain competitive
- Reducing the site's reliance on electricity and gas consumption
- Making use of significant levels of waste heat



## Energy efficiency opportunities investigated

- Making full-use of an existing heat reclaim system already installed in the plant to produce all the pre-heated water (up to 70oC) needed for the site's operations
- Conversion of the current electric shrinking packaging system with a more efficient steam-based system
- Improve boiler efficiency by replacing old boilers (78% efficiency) with three new steam boilers (94% efficiency) to take hot water from 70oC (from heat recovery) up to 95oC used for processing.

# Thomas Foods International

## Results & benefits

- Annual gas savings of 224,000 litres of LPG
- Annual electricity savings of 177,800 kWh
- Annual energy cost savings amounting to over \$75,000
- Annual savings in water consumption of 3,700,000 litres, with an estimated cost of over \$9,000
- Annual savings in water treatment and service costs of \$28,000
- Annual savings in maintenance costs, estimated between \$15,000 and \$20,000.

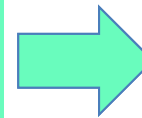


# BCEEE ('Bickie' Toolkit)



## 7 Technical Workbooks

- Refrigeration
- Cooking & heating
- Pumping
- Compressed air
- Steam & hot water
- Heating, ventilation & air conditioning (HVAC)
- Lighting



## Each workbook is structured in four steps:

1. Optimise existing equipment
2. Retrofit & replace equipment
3. Prioritise energy efficiency opportunities
4. Collect the right information



## Business Case Assessment Workbook

- What's the business case for energy efficiency?
- Assessing business benefits
- Assessing cost and risks
- Assessing capabilities




## Case studies





# BCEEE Toolkit: How to get the most out of it

- Gives you ideas on energy efficiency opportunities across key areas of food production
- Is NOT intended to turn you into an energy efficiency expert
- Focused on equipment only – excludes process efficiency
- Focused on giving you enough information to engage with the equipment supplier or existing maintenance provider
- It's not a silver bullet
- It's a start, but there's more to do...



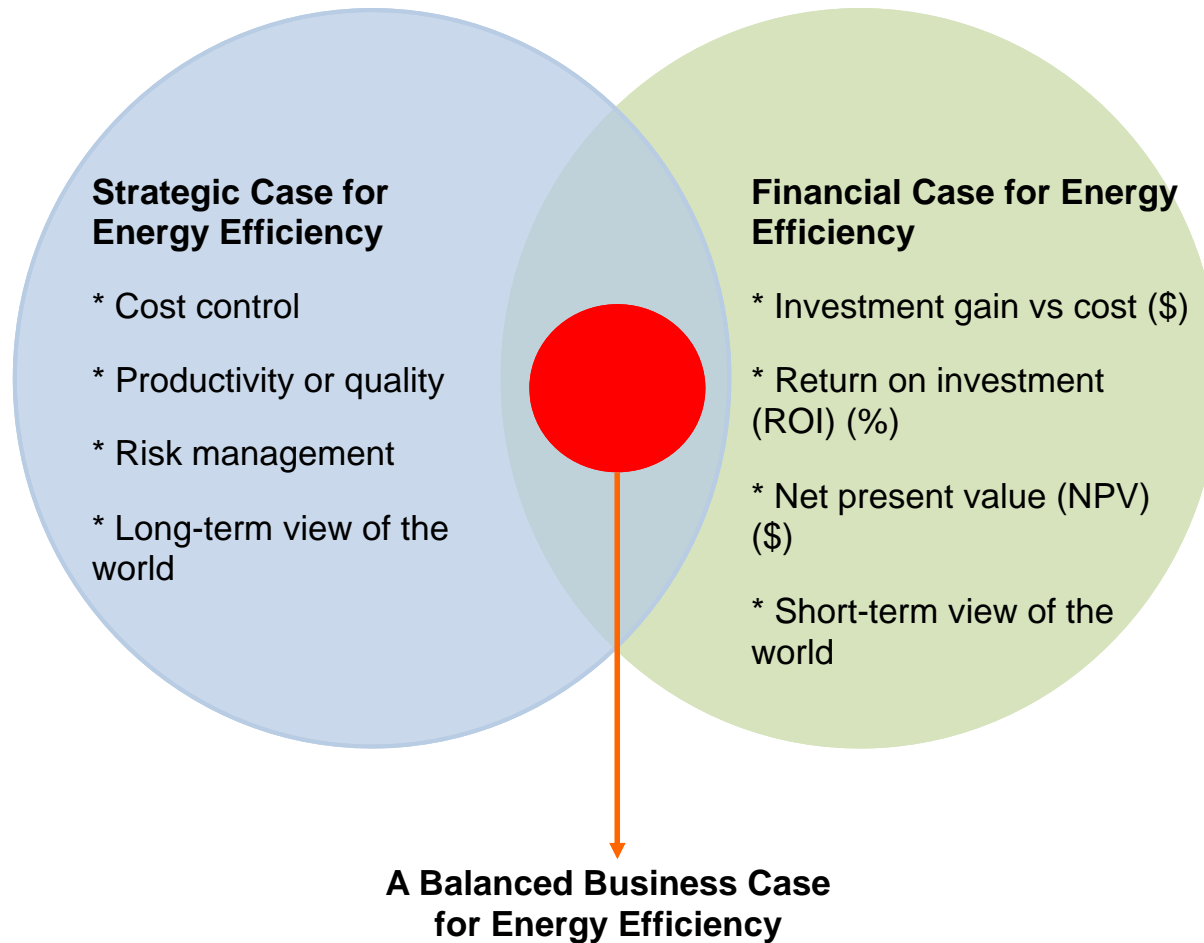
Energy efficiency for SA food  
businesses: lessons learned, tips and  
what's next

# Consider energy efficiency as part of the bigger productivity picture

- Energy efficiency for ‘energy efficiency’s sake’ can only take you so far
- Energy consumption provides an indicator of how efficient (or inefficient) the business is operating
- The best energy efficiency improvements are the ones that improve the overall productivity of the business
- Helps to challenge assumptions about what’s possible in the business

Consider energy together with all physical inputs and outputs (materials, labour, water, waste) to identify productivity ‘sweet spots’

# Energy efficiency should start with the business case, not end with it



# Use as many financial tools as possible

	<b>Project A Refrigeration Upgrade</b>	<b>Project B 50kW Solar PV</b>	<b>Project C Occupancy sensors (lighting)</b>
<b>Outlay</b>	\$240,000	\$120,000	\$40,000
<b>Energy Savings (p/a)</b>	\$30,000	\$15,000	\$5,000

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<b>Payback</b>	8 years	8 years	
<b>ROI (%)</b>	88%	150%	
<b>NPV (<math>r = 7\%</math>)</b>	\$33,237	\$38,910	
<b>IRR</b>	9%	11%	4%

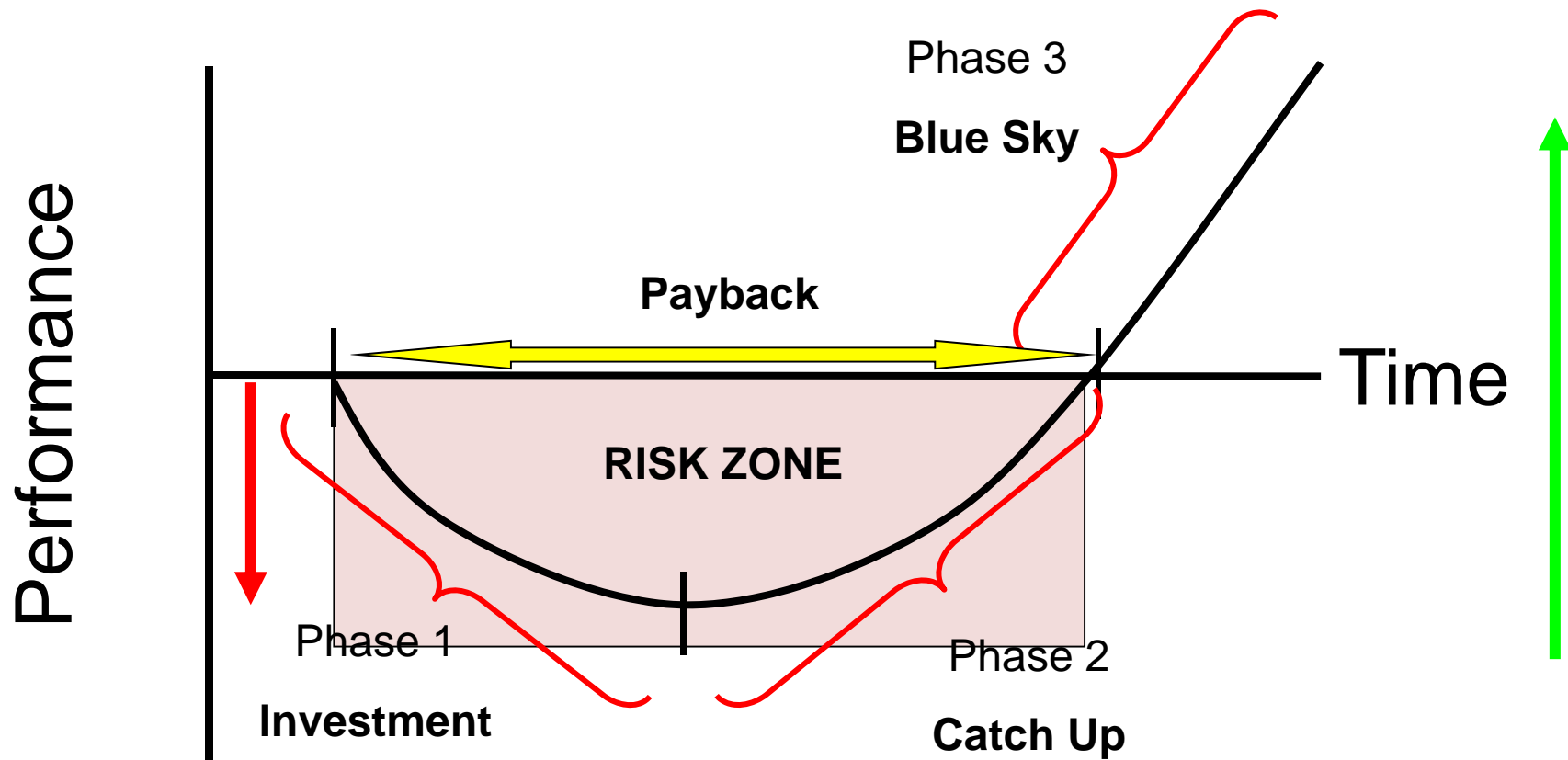
**Which one would  
you go for?**

**Project A  
VS  
Project B?**

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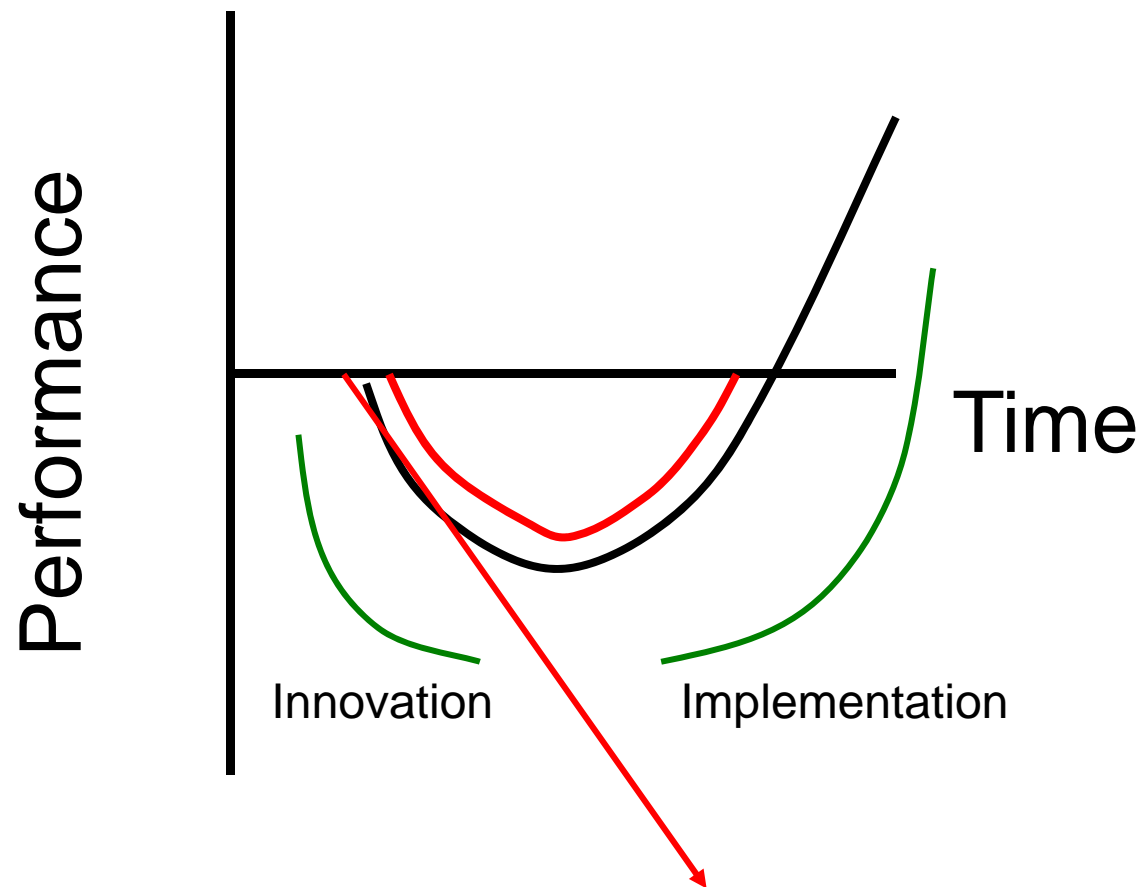
**Remember: Selecting the solution with the multiple benefits (quantifiable) can make all the difference!**

# Make sure you have the capability (and stomach) to follow-through





# Make sure you have the capability to follow-through




1. Measure and manage depth and breadth of the valley
2. Do NOT become emotionally connected to the J curve
3. Do NOT take on too many macro J curves at once
4. Have and manage a plan to move from phase 1 to phase 3 as quickly as possible
5. Establish a J Curve Register.



## CEFC Investments: Energy Efficient Loans

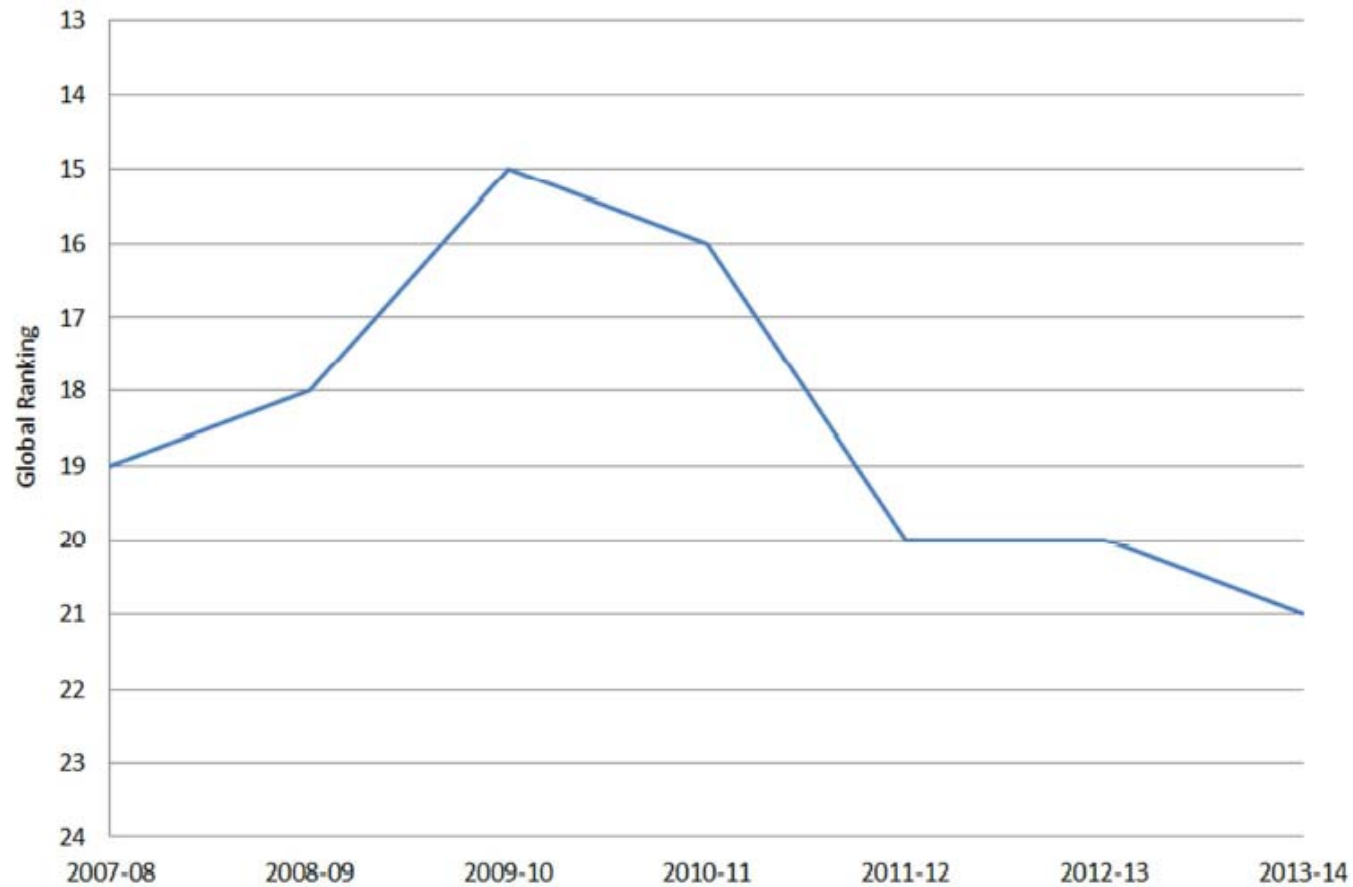
### A \$100 million co-financing arrangement with CBA to fund energy efficiency projects with industry clients

- The CEFC and Commonwealth Bank (CBA) are co-financing loans tailored for businesses wanting to save on energy costs
- Under a Master Funded Participation Agreement (MFPA), the CEFC and CBA are co-financing **Energy Efficient Loans** for energy efficiency, low emissions technology and small-scale renewable projects
- **Energy Efficient Loans** will typically range between \$500,000 and \$5 million +
- Loans available from CBA nationwide for project opportunities which meet CEFC eligibility criteria
- The CEFC commitment is \$50 million-matched by funding from CBA



What does the future hold for  
'energy efficiency' with the SA food  
industry?

**Chart 1. Australia's Global Competitiveness Ranking**



Source: WEF

Improving productivity is now a key priority



Group discussion: lessons learned  
and future directions