

AGL Energy Limited

Identifying, implementing
and evaluating energy
efficiency opportunities.

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AGL Energy Ltd

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Contents

- > Energy Efficiency – Barriers & Macro opportunities

- > 3 case studies:
 - » Portfolio of leased office sites (Buildings - lighting)
 - » Manufacturing facility (Industry – fuel conversion)
 - » Manufacturing facility (Industry – various)

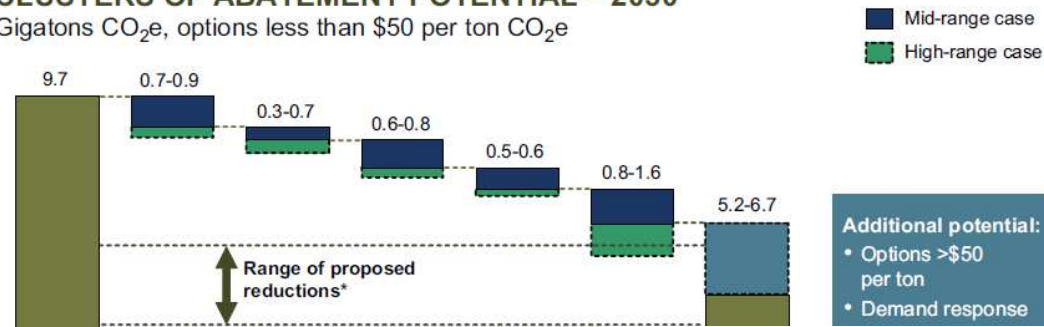
Barriers to Energy Efficiency

If it is the least cost abatement, why hasn't energy efficiency been taken up more?

- > Lack of local expertise in identifying and implementing opportunities.
- > Relatively cheap price of energy.
- > Split incentives.
- > Typically projects are undertaken through an ad-hoc approach (not as part of a holistic integrated management strategy).
- > It can be capital intensive (does investment in energy efficiency get the same treatment as investment in revenue producing activities?).

CLUSTERS OF ABATEMENT POTENTIAL – 2030

Gigatons CO₂e, options less than \$50 per ton CO₂e



ABATEMENT OPTIONS – BUILDINGS-AND-APPLIANCES CLUSTER

Options less than \$50/ton CO₂e

MID-RANGE CASE – 2030

Projected emissions 9.7
Buildings & appliances 0.7-0.9
Transportation 0.3-0.7
Industry 0.6-0.8
Carbon sinks** 0.5-0.6
Other 0.8-1.6
5.2-6.7

Range of proposed reductions*

* Based on bills introduced in Congress that address climate change and have quantifiable targets; targets calculated off the 2030 U.S. GHG emissions.
** Including abatement in the agriculture sector
*** Adjusted for cumulative rounding errors
Source: U.S. EIA; EPA; USDA; McKinsey analysis

	Average cost \$(2005 real)/ton CO ₂ e	Potential Megatons CO ₂ e	Description of opportunity
Lighting	-87	240	• Substitution of advanced lighting technologies, e.g., CFLs and LEDs, for inefficient lighting
Electronic equipment	-93	120	• Increased in-use efficiency and reduced stand-by losses in PCs, office equipment, televisions (including set-top boxes), audio systems, and similar devices
HVAC equipment	45	100	• More efficient HVAC equipment in initial installation and in retrofits • Performance tuning for existing systems
Combined heat and power	-36	70	• Increased penetration in large office buildings (>100,000 sq.ft), hospitals and universities
Building shell	-42	60	• Improved new-build shells and building retrofits in commercial and residential buildings, e.g. better insulation, air tightening, reflective roof coatings
Residential water heaters	-8	50	• Improved efficiency and switch to alternative fuel/technologies, e.g., tankless and natural gas
Other		70	• Building controls • Residential and commercial appliances • Commercial water heaters • Fuel switching in residential and commercial heating

Source: McKinsey analysis



Practical Implementation of Energy Efficiency

- The value of engaging
in a delivery model

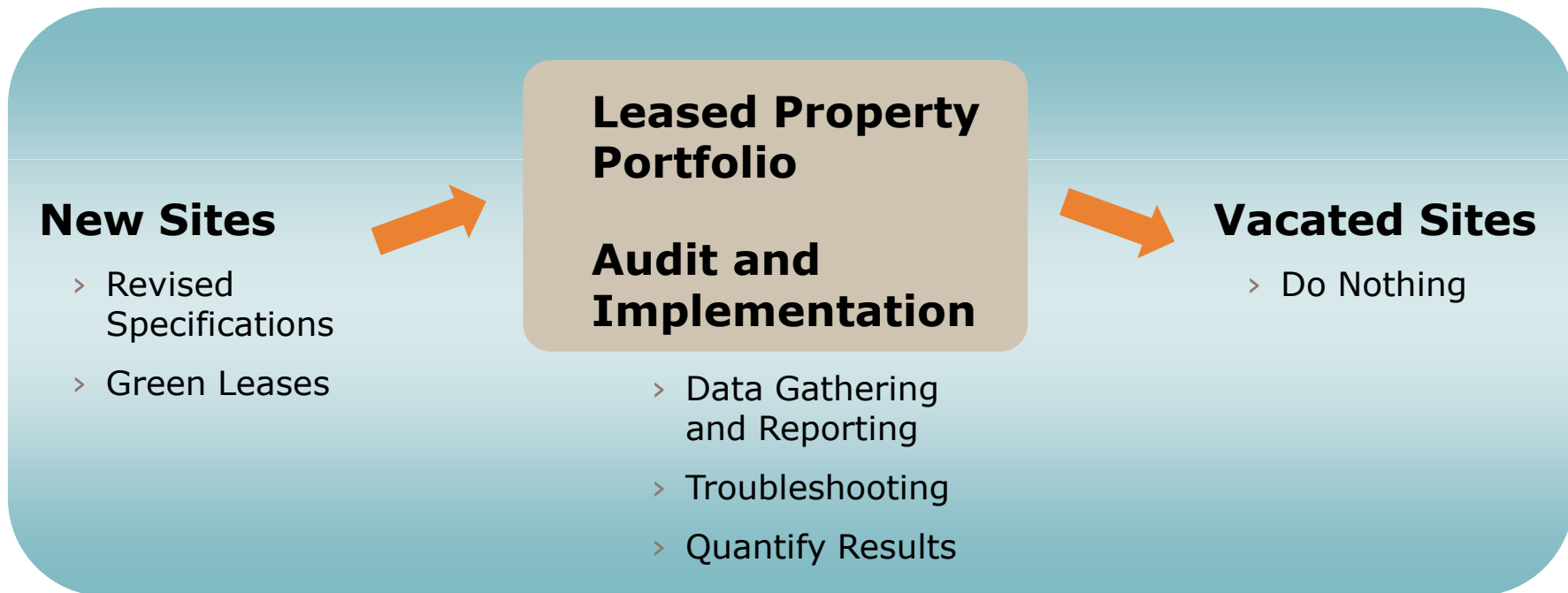


Case Study 1: Multi site – Commercial Office Space

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Customer Objective

- > To be a leader in government operations in the application of energy management and meet government performance standards.



Case Study 1: Multi site – Commercial Office Space

Outcomes	
Reduction in Energy Consumption	10.3 million kWh p.a
Value of Energy Saved;	\$1,698,000 p.a
Reduction in CO ₂ -e Emissions;	10,000 tonnes p.a.
Percentage of Energy Consumption Saved	14.4%.
Reduced Maintenance Costs;	\$318,000 p.a.
Return on Investment	26.3%
Relative Carbon Cost (RCC)	-\$125/tonne

- > Additional Benefits:
 - » Over \$1.6m recovered from landlords for incorrect metering and lease ambiguities
 - » Improvement in employee engagement.

Case Study 2: Fuel Switching

Customer Objective

- › Reduce fuel costs.

Issue

- › Plant currently fuelled from LPG, Coal and Diesel resulting in high delivered costs per GJ.

The Solution

- › Design an innovative fuel conversion and replacement program that:
 - › Reduces fuel costs
 - › Reduces Carbon liability
 - › Reduces maintenance costs
 - › Saves energy.

Case Study 2: Fuel Switching

Outcomes	
Fuel Cost Savings	\$899,094 p.a
Energy Savings	19,688 GJ p.a
Reduction in CO ₂ -e Emissions	3,727 tonnes p.a.
Percentage of Energy Consumption Saved	17%
Reduced Maintenance Costs	\$298,000 p.a.
Return on Investment	79%
Relative Carbon Cost (RCC)	-\$305/tonne

Case Study 3: Energy Reduction Strategy

Customer Objective

- > Meet internal KPI's for energy reduction.

Issue

- > Customer has the desire, but not the resources

The Solution

- > Comprehensive facility audit:
 - » Steam Generation
 - » Lighting
 - » HVAC
 - » Compressed Air
 - » Control systems

Case Study 3: Energy Reduction Strategy

Outcomes		
Item	% Site Energy	RCC
Boilers	13.3%	\$19
Lighting	2.1%	-\$67
HVAC	7.3%	-\$48
Controls	5.7%	-\$32

- > Identified energy savings equal to 28% of energy consumption.
- > Prioritising measures based on RCC to optimise implementation strategy.

Summary

- Internal abatement measures are 100% at the control of the user.
- Coordinated in a strategy dealing to energy price increases &/or a carbon constraint is invaluable.