



# **Carbon Management Logistics Business Opportunities**

## **Logistics Sustainability Case Studies**

# Case 1 – Office Lighting, A/C, Server & Appliances

Energy Consumer:	Mitigation options
<p><b>Lighting:</b>  <b>T8 Fluro lamps -</b></p> <ul style="list-style-type: none"> <li>- Contains higher contents of mercury than T5 tubes</li> <li>- High level of lumen depreciation</li> <li>- Short life cycle hence greater maintenance required</li> <li>- Higher heat expenditure from ballast</li> </ul>	<p><b>T5 Fluro Lamps With Reflective fittings</b></p> <ul style="list-style-type: none"> <li>- 'Instant on' capability: compatible with occupancy sensors and dimming</li> <li>- 3 times lamp life</li> <li>- Electronic Ballasts expel less heat, reduces flicker and reduces lumen depreciation</li> </ul> <p><b>Delamping</b> – Most office buildings are over lit, especially for those with windows offices. Delamping simply involves using one Fluorescent tube instead of two in a standard fitting – halving usage.</p> <p><b>Occupancy/ motion sensor lighting</b> - Systems could be installed as an innovative move to reduce wasted lighting. Acts as an obvious motivator to staff.</p>
<p><b>Temperature control:</b>  <b>A/C and heating –</b></p>	<p><b>Behavioural Changes:</b> According to the ACCC the best temperature is around 23 to 26°C. Put in place a jumper rule for the office in winter limiting pressure on the heater and encourage the use of external blinds in summer.</p>
<p><b>Server &amp; additional A/C</b></p>	<p><b>Upgrades:</b> Whilst replacing server rooms can be extremely expensive, it is worth discussing the advantages of upgrades with your technician to reduce demand of electricity on the current system.</p>
<p><b>Office Appliances</b></p>	<p><b>Behavioural Changes:</b> such as power saver modes on laptops, introducing a switch off policy and 24 hour times on appliances not required after business hours.</p>

## Case 2: Depot/Warehouse Lighting

- Warehouse lighting is major portion of the electricity consumption at Depots, Workshops and Warehouses.



a/ 4000k MVR Metal Halide



b/ T5 Fluorescents

- **Most traditional warehouse and factories utilise the Metal Halide high bay lamp,**
  - There are several alternative options available with multiple advantages.
- **Australian OH&S standards state the minimum luminance levels:**
  - Storage of large items in Warehouses = 80 lux, Storage involving reading tasks = 160 lux
  - The alternative lighting options offer improved lighting luminance

## Case 2: Warehouse Lighting

- Kwh Comparison of T5 fluorescent and metal halides

		Total Kw	Kw Savings	Tonnes CO2e	Black Ballons
Total Warehouse Highbay Lamps	101				
Power Consumption per existing HB Lamp	456	46056		5.6	112377
Power Consumption per T5 HB	227	22927	49.8%	2.8	55942

- Warehouse Light Cost Analysis over 50,000 hours: T5 fluoro vs. Metal Halide

Type	Lamp replacement costs / 50,000 hours	Lamp Change	Waste Volume	Embodied Energy	Recycling	Energy cost *	Maintenance labour to swap-over +	Lifetime \$ cost to owner
400W Metal Halide 10,000/15,000 hour \$45/\$55 each	10,000h = \$225 15,000h = \$220	4-5	High	High	HID lamps are not generally recycled but can be.	\$3,427	\$170	\$3,797
55W Aura Fluoro x 4 48,000 hours \$49.50 each	\$198	0	Low	Low	Fluorescent lamps should be recycled by an accredited recycler.	\$1,180	\$0	\$1,378
<b>Savings</b>	\$22 to \$27	4-5	Less waste	Less carbon	100% recyclable	\$2,247	\$170	\$2,149

## Case 3: Logistics

- **Department of Energy estimated that drivers can improve fuel consumption by 7% by simply:**
  - Keeping car tires properly inflated = 3%
  - Regular maintenance = 4%
- **RACV Australia**
  - Tyres that are low on air pressure have greater rolling resistance. That means your car's engine works harder, using more fuel.
- **Co-operating with Logistics Company's can result in a win-win situation for all parties involved – Strategies which may be worth discussing include:**
  - Idle Reductions for long haul and metro fleets
  - GPS
  - Route Optimisation / Transportation Management Systems (TMS)
  - Automatic Tire Inflation Systems
  - Wide-base & New Technology Tires (silicon based)
  - Driver Training (braking, idle, acceleration/deceleration, speed)
- **All the above result in reduced cost and GHG emissions**

# Case 4: Paperless WMS Technology

RF and Voice Technology have proven returns in improving warehouse productivity

	Year 1			Year 2		
	Paper Picking	RF Picking	Voice Picking	Paper Picking	RF Picking	Voice Picking
Capital Investment	\$ -	\$ 48,000	\$ 96,000	\$ -	\$ -	\$ -
Productivity Gains	0%	0%	6%	0%	0%	8%
Labour Saving (Picking)	\$ -	\$ -	\$ 49,795	\$ -	\$ -	\$ 68,385
Labour Saving (Admin - 1 Person)	\$ -	\$ 59,280	\$ 59,280	\$ -	\$ 61,058	\$ 61,058
Picking Accuracy	98.70%	99.95%	99.95%	98.70%	99.95%	99.95%
Accuracy Cost	\$ 32,500	\$ 1,250	\$ 1,250	\$ 33,475	\$ 1,287	\$ 1,287
Maintenance & Repairs to Equipment						\$ 1,000
Extended Warranty - Terminals	\$ -	\$ 6,000	\$ 9,600	\$ -	\$ -	\$ -
Site Support	\$ -	\$ -	\$ 5,000	\$ -	\$ -	\$ 5,000
Savings Year 1	-\$ 32,500	\$ 36,530	\$ 29,725	-\$ 32,500	\$ 36,530	\$ 29,725
Savings Year 2				-\$ 33,475	\$ 93,246	\$ 156,631
Savings Year 3						
Total Saving	-\$ 32,500	\$ 36,530	\$ 29,725	-\$ 65,975	\$ 129,776	\$ 186,357

## Case 4: Paperless WMS Technology

- These technologies have several indirect advantages such as dramatically minimising paper consumption and improving staff moral

	Warehouse	Office
Boxes received per fortnight	56 boxes (280 reams)	4 boxes (20 reams)
Boxes received in 7 month time period	56 boxes * 15 fortnights	4 boxes * 15 fortnights
Total boxes received	840 boxes	60 boxes
Total reams received	4200 reams	300 reams
Total sheets received	2,100,000 sheets	150,000 sheets

- Assuming Site X continues a similar rate of consumption - 1540 boxes will be purchased a year.
- Assuming the average box of office paper costs \$30 - the paper cost per annum in the warehouse is \$46,200.
- If the paper consumed for picking processes is estimated at 35%, using paperless voice picking technology would provide additional savings to that shown in Table 6 of \$16,170 per annum
- Based on the 35% reduction in paper used in picking - this represents 539 boxes or 2695 reams per annum which equates to:
  - A reduction of 22615 kg of carbon dioxide in the atmosphere or 452300 black balloons per annum
  - 31.5 metric tons less of atmospheric carbon dioxide due to trees saved

## Case 5 - Human Resources and Employee Empowerment

- Company Run Transit (outsourced!)
  - Reduces congestion
  - Greatly improves employee morale and loyalty
- Company CSR policy that addresses Employee concerns regarding Environment, Social, Cultural sustainability
  - is a draw card for new employees, especially generation Y
  - increases staff retention and loyalty
  - reduces absenteeism
  - improves productivity

## Case 6 - Other Sustainability Considerations

- Investigate what are clients up and down stream doing in terms of environmental policy, especially in terms of procurement, waste and recycling
- **Building Design**
  - Insulation
  - Orientation
  - Sky lights
- **Water**
  - Tanks and or Grey Water Systems
    - Gardens, Sports Grounds
    - Staff Car Wash
    - Toilet Flushing
  - Waterless Toilets
  - Time delayed taps
- **Solar Hot Water**
- **Geothermal Car Park Heat Sinks**
- **Solar Photovoltaic Power**