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# Lighting

Lighting - bright ideas  
to save money!

# 3

## Eco-efficiency for the Marine Industry Fact Sheet

### Do you want to

- reduce what you spend on lighting?
- save on labour costs?
- improve the quality of lighting on your site?
- reduce your consumption of fossil fuels and production of greenhouse gases?

An energy-efficient light bulb can save up to 80% of lighting costs and pay for itself in less than six months!

### Check to see if you are managing your lighting efficiently

- Have you installed energy-efficient lighting? There have been many new advances in lighting equipment and design that can improve not only energy efficiency but also the quality of lighting. See table 1 for more details.
- Could you use natural lighting (e.g. skylights) to replace electric lighting?
- Have you investigated whether your lighting needs could be met by fewer lights?
- Do you switch off lights when they are not required? Posters and stickers could be used to promote awareness of energy efficiency.
- Do you have occupancy sensors or timers to automatically turn off lighting in little used areas (e.g. toilets)?
- Do your lights have effective and clean reflectors to ensure maximum output?



**Table 1: Comparison of different types of lighting<sup>[1,2]</sup>**

	Incandescent	Tungsten halogen		Fluorescent
		240V	6-21V	
Wattage (W)	15-1500	50-2000	10-75	8-36
Capital cost	Low	Low	Low/medium	Low/medium
Relative operating costs	High	High	Medium	Low
Efficacy (lumens/watt)	10-17	22	30-50	Tube 30-110 Compact 50-70
Average life (hrs)	750-2,500	2,000	2,000-4,500	Tube 7,000-24,000 Compact 10,000
Deterioration of light quality over time	Light output falls 15% through life	Very little	Very little	<20%
	Metal halide	Mercury vapour	Sodium high pressure	Light emitting diodes (LED) <sup>[3]</sup>
Wattage (W)	35-3500	40-1000	35-3500	3-4.2
Capital cost	High	Low	High	High
Relative operating costs	Very low	High	Medium	Very low
Efficacy (lumens/watt)	60-115	25-60	50-140	11-15
Average life (hrs)	5,000-20,000	16,000-24,000	1,600-24,000	50,000
Deterioration of light quality over time	<45%	High	<15%	Very little

Always consider the characteristics of the light needed (e.g. warm or cool, brightness), ceiling cavity, room size, ceiling height and room colours when changing lighting.

Note that inefficient downlights can now be replaced with fluorescent or light emitting diode (LED) technology without complicated rewiring or increasing cavity size. Contact a lighting supplier for more information.

## How much could your business save on lighting?

### Example: A boat builder made the following lighting changes

Location of the lights	Number and type of existing lights	Number and type of proposed lights
Toilets, hallways and lunch room	15 incandescent	15 compact fluorescent bulbs
Shop and display room	10 inefficient dichroic down lights	10 compact fluorescent bulbs
Shed	20 inefficient mercury lamps	20 metal halide lamps
Over lit storage room	16 halophosphor fluorescent tubes (two tubes per light)	8 triphosphor fluorescent tubes (18% more light output - one tube per light)

All lights are currently used 8 hours per day, for 255 days a year and electricity costs 15.1c/kWh.

### The results: The replacement of inefficient light bulbs saved the business over \$2,000 annually!

Existing lamp	Energy-efficient lamp	Number of lights	Light wattage (kW)	Hours of use	Electricity cost (c/kWh)	Days of use per year	Cost to run per year	Annual savings
Incandescent		15	0.075	8	15.1	255	\$346.55	\$277.24 Bulbs last 10 times longer
	Compact fluorescent	15	0.015	8	15.1	255	\$69.31	
Dichroic down lights		10	0.035	8	15.1	255	\$107.81	\$86.25 Bulbs last up to twice as long
	Compact fluorescent	10	0.007	8	15.1	255	\$21.56	
Mercury		20	0.700	8	15.1	255	\$4,312.56	\$1,848.24
	Metal halide	20	0.400	8	15.1	255	\$2,464.32	
Halophosphate fluorescent		16	0.040	8	15.1	255	\$197.15	\$98.58 Bulbs last 60% longer
	Triphosphate fluorescent	8	0.040	8	15.1	255	\$98.57	

Ecobiz can assist you to reduce costs and improve eco-efficiency in your business  
Call 1300 369 388 for further information.

## How could lighting changes save you money?

- Count the number and record the type of lights currently used on your site. Are there opportunities to install energy-efficient light bulbs, or areas where lighting needs could be met by fewer lights?
- Calculate how much it currently costs to operate the existing lights and the cost to operate the proposed energy-efficient lights.

**Annual cost to operate:** \_\_\_\_\_ lights x \_\_\_\_\_ kW x \_\_\_\_\_ \$/kWh x \_\_\_\_\_ hours x \_\_\_\_\_ days = \$ \_\_\_\_\_/yr

Number of lights	lights
Light bulb wattage (e.g. 60 W is 0.06 kW)	x kW
Cost of electricity	x \$/kWh
Number of hours the lights are used each day	x hours
Numbers of days the lights are used each year	x days
<b>Total \$/year</b>	<b>= \$ _____ /year</b>

## Useful websites

*Quantifying savings:* SEDA Energy Smart Toolbox Lighting Calculator [www.energysmart.com.au/wes/DisplayPage.asp?PageID=52](http://www.energysmart.com.au/wes/DisplayPage.asp?PageID=52)

*Fact sheets:* Sustainable Energy Authority Victoria [www.seav.sustainability.vic.gov.au/advice/business/infosheets/lighting.asp](http://www.seav.sustainability.vic.gov.au/advice/business/infosheets/lighting.asp)

*Choosing a lighting system:* NSW Energy Smart [www.energysmart.com.au/les/DisplayPage.asp?PageID=46](http://www.energysmart.com.au/les/DisplayPage.asp?PageID=46)

*Types of lamps:* [www.greenhouse.gov.au/yourhome/technical/fs45.htm](http://www.greenhouse.gov.au/yourhome/technical/fs45.htm)

## References

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## For further information

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