

# 20% Emission Reduction Targets you can do yourself

By Graeme Jessup

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Maybe the government can't do it, but here's how you can easily reduce your household emissions to meet the 20% target by year 2020. In our new house at Mona vale Barbara and I have reduced household emissions by around 50%. In this series of articles I will explain how we did it.

First let's see what the typical household emits each year.

## Current Household Direct Emissions

A typical home could have the following annual emission levels from the following sources expressed in tonnes of CO<sub>2</sub>/yr:

**Lighting** 1 tonne/yr 5% (easy to reduce by 0.4 tonnes/yr)

**Hot Water** 3 tonnes/yr 15% (easy to reduce by 2.4 tonnes/yr)

**Space Heat/cool** 2 tonnes/yr 10% (easy to reduce by 1.0 tonnes/yr)

**Appliances** 2 tonnes/yr 10% (easy to reduce by 1.0 tonnes/yr)

**Car Usage – 2 cars** 8 tonnes/yr 40% (easy to reduce by 4.0 tonnes/yr)

**Air Travel** 4 tonnes/yr 20% (easy to offset by 4.0 tonnes/yr)

**Total without savings: 20 tonnes CO<sub>2</sub>/yr**

**Total with all savings: 12.8 tonnes CO<sub>2</sub>/yr**

## Notes:

- Many larger houses can emit twice this amount.
- These figures do not include emissions resulting from the food supply chain, building construction, industry, commercial operations, and from all levels of Government.

The target of 20% reduction by 2020 is absolute – if our population increases then per capita we will have to reduce somewhat more than the 20%. As an approximation we will assume that we need to cut household emissions by 25% or by 5 tonnes of CO<sub>2</sub> emissions each year.

Based on the above table, there are several options for reducing overall household emissions by 25% - for example by using CFL lights and solar hot water and using efficient appliances. OR you can simply commit to buying 100% Greenpower from your electricity supplier and save up to 40% from day one – what an easy solution!

Lets start with the easy one – Lighting.

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## LIGHTING

It is easy to make a significant reduction on greenhouse gas emissions by modifying your household lighting. If you have a lighting system based on the old incandescent lights and lots of low voltage halogen lights in the ceiling, then you can expect a reduction of more than 50% if you change to Compact Fluorescent Lights (CFL lights). Unfortunately changing to CFL lighting will probably not provide the same quality of lighting you are used to, but it will save energy and greenhouse emissions.

### Things You Need to Know about CFL lights

1. **Startup time** – many CFL lights take about 60 seconds to reach a good level of brightness, and may take up to 5 minutes to reach maximum brightness. In time the quality of manufacture will no doubt get better, but initially you will just have to accept this slight inconvenience. Some of the better brands seem to be better at lighting quickly – see my suggestions later.
2. **Brightness** – CFL lights are a lot more efficient than the conventional tungsten lightglobe, and are usually rated to need only 20% of the power for the same brightness. However this often does not appear to be the case and it is prudent to work on 25% rather than 20%. So to replace a 60W lightbulb try a 15W CFL.
3. **Construction** – the corkscrew designs are better than the long thin designs at projecting light in all directions and are to be preferred. In some situations the CFL lights encased in frosted glass bulb may be better suited, especially if light is required primarily end on to the lamp – try different options.
4. **Life** – Some CFL lights fail prematurely and do not reach the specified lifetime of 8000 hours. However they last a lot longer than the conventional lightbulb.
5. **Light “Colour” or more correctly “Temperature”** – CFL lights are available in different light “colours” or specified “temperatures” – Cold White (more like natural daylight), or Warm White (more like the conventional tungsten light). Most people prefer the Warm White for interior use.
6. **Cheap CFL Lights** - Avoid cheap brands with no solid history in Australia. Possible problems are short life, long warm-up time, electrically noisy (affecting radio reception), excessive mercury.

Australia has now regulated to phase out conventional incandescent lightbulbs.

### The Lighting Plan

To get the best solution you will need to identify the needs of each lighting area in your house. It will help if you can base the plan on having a low level of background lighting, supplemented by separate task lights to be turned on when necessary. In this way you will find that for most of the time your lighting needs will be as low as possible.

This is how we set up the lighting plan for our house:

#### Lounge – 4.0m x 4.5m

For background lighting we installed six off 20W small diameter tubular fluorescent lights mounted above the roller blinds. These lights are shielded so they cannot be seen directly from the lounge floor and provide a soft background light reflected off the timber ceiling. The tubular fluorescent lights need no time to warm up and come on immediately to full brightness. If you have a white ceiling (which reflects a lot more light) you could need only two of these 20W lights. These lights are sufficient for normal living requirements including watching TV.

For reading we have a rail of four track mounted lights above the settee that can be swivelled to direct the light as required. These fittings accommodate small ultra compact CFL Type GU10 type

colour Warm. Alternatively you could use a standard reading lamp with a 15W CFL at the reading location. We also have ceiling mounted fans in each room and these are fitted with 100W quartz lights. We very rarely use these fanlights but they are handy to provide extra light for special occasions.

### **Dining Room – 3.5m x 4.0 m**

Same configuration as for the lounge, but we fitted only two 20W long tubular fluorescents and no reading lights. The centrally located overhead fan light can be used if special lighting is required.

### **Kitchen 3.5m x 3.5m**

Two 20 W Tubular fluorescent lights are mounted under the overhead cupboards to provide bright dispersed lighting on the workbench below. In addition we have a rail of four 15W GU10 Warm track mounted CFL lights above an island bench – these provide excellent dispersed lighting without any distracting sharp shadows.

Background lighting is provided by two high level 20W long tubular fluorescents

### **Entrance Foyer – 2.0m x 4.0m**

Three smart modern wall mounted Up/Down stainless steel light fittings provide background lighting in the foyer. Each fitting houses two 10W GU10 CFL Warm lights.

### **Hallway – 1.1m x 12.0m**

The hallway is adequately lit using three recessed ceiling downlight fittings each fitted with a standard Edison screw 15W CFL Warm bulb. A circular diffuser mounted just below the light softens the light and hides the harsh light when looking up at the CFL bulb itself. These three lights have proved to be absolutely perfect for hallway lighting.

### **Bedrooms – 4.0m x 3.5m**

One stainless steel light fitting with two 10W GU10 Warm CFL lights provides background lighting, and wall mounted bed lamps fitted with flat CFL bulbs are used for reading in bed. Each bedroom is also fitted with a centrally mounted ceiling fan with light.

### **Sunroom – 3.0m x 5.0m**

The sunroom has two stainless steel downlight fittings with two 10W GU10 Warm CFL lights, plus four recessed ceiling downlight fittings each fitted with a standard Edison screw 15W CFL Warm bulb. The four 15W CFL downlights have proved to be just right for normal activities in the sunroom

### **Offsetting Emissions**

Alternatively it is easy to offset your emissions by paying an organisation to plant trees or generate renewable energy for you. It costs around \$15 to \$30/tonne CO2 each year – visit the following links for more details:

- [www.climatefriendly.com/shop](http://www.climatefriendly.com/shop)
- [www.greenfleet.com.au](http://www.greenfleet.com.au)

### **Summary**

Our fluorescent lighting is entirely satisfactory for our needs and draws less than 50% of a traditional lighting plan using multiple overhead halogen downlights. The only drawback is the delay in reaching full brightness - which is soon accepted as one of the things to get used to in

moving towards a sustainable lifestyle. There is a good feel to living a more energy efficient lifestyle and by ensuring that we turn off unwanted lighting we have reduced our lighting energy use even further.

## Lighting Fittings

Light fittings were sourced from –

**LIGHT ON – Cremorne** [www.onlinelighting.com.au](http://www.onlinelighting.com.au)

- Tubular fluorescent Lights – Model WL 025 – 28W Linkable



- GU10 CFL Lights – Espar EcoLamp



- Standard CFL bulbs (bayonet or Edison Screw) –



- Stainless steel light fitting with two 10W GU10 Warm CFL lights



CFL Downlights – 15W Warm White standard Edison or bayonet lights – Model CLA 2432 AW with round diffuser to soften the lightsource.



**NECO** – [www.neco.com.au](http://www.neco.com.au)

Track Lighting based on 13 W GU 10 CFL lights with conical reflectors



Track lighting with Megaman GU10 and reflector

Track lighting with Neco GU10 and reflector  
\* the reflector is not a tight fit with the Neco GU10,  
some custom assembly is required.

## **BUNNINGS**

Bunnings stores also have a great range of CFL and fluorescent fittings.