Measuring Energy Usage
In Your Business

Presented by Craig Benporath, GreenHouse International

Australian Government
Department of Industry

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

Measuring Energy Usage In Your Business - ©TCFWA 2014 All rights reserved

In this Webinar you will discover:

- *How energy is produced in Australia.*
- *How energy is measured.*
- *How to de-code energy terminology.*
- *How to complete an energy load assessment.*

Measuring Energy Usage In Your Business - ©TCFWA 2014 All rights reserved

Sources of energy in Australia

FACTS

About 75% of Australian electricity is produced using coal, 15% by natural gas and most of the remaining 10% is from renewable sources.

Source: Energy in Australia 2012 www.bree.gov.au

Measuring Energy Usage In Your Business - ©TCFWA 2014 All rights reserved

Sources of energy in Australia

Coal – Most electricity in Australia is produced by coal-fired power stations – a fairly inefficient and polluting process. In a coal power station, over 60% of the energy contained in coal is lost as 'waste heat'. Further losses are incurred as energy is sent through the transmission and distribution network.

Gas – Natural gas is used both directly (mains gas) and indirectly (electricity generation) by many businesses. LPG, a petroleum by-product, is often used where mains gas is not available. Gas burns more cleanly and produces significantly less carbon emissions than coal.

Renewables – The largest renewable energy contribution on the electricity network is made by hydroelectric power, with wind and solar making a small but growing contribution. On-site renewable energy generation, such as solar hot water and solar photovoltaic (PV) panels, are often cost-effective but under-utilised by businesses.

Measuring Energy Usage In Your Business - ©TCFWA 2014 All rights reserved

Sources of energy in Australia

FACTS

For every 1 kWh of electricity used in Australia, between 0.3 kg (in Tasmania) and 1.35 kg (in Victoria) of carbon dioxide gas, or its equivalents, is emitted.

Source: National Greenhouse Fcators 2012 www.climatechange.gov.au

Measuring Energy Usage In Your Business - ©TCFWA 2014 All rights reserved

Measuring energy usage

- Electricity consumption is measured in **Watts (W)**
- The amount of electricity used over time is measured and billed in **kilowatt-hours (kWh)**

- **Question -** If this appliance is left on for 3 hours, how much energy will it use?
- **Answer -** 80 Watts x 3 hours = 240 Wh = 0.24 kWh

- Natural gas consumption is measured in cubic metres and billed in **Mega-joules (MJ)**
- LPG is measured and billed in **kilograms (kg)** or **litres (L)**

Measuring Energy Usage In Your Business - ©TCFWA 2014 All rights reserved

Useful terms and conversions

- One watt = one joule per second (1 W = 1 J/s)
- One thousand watts = one kilowatt (1000 W = 1 kW)
- Electricity, gas and other energy consumption can be compared to each other by converting them to the same unit of measure.

- For example:
  - 1 kWh = 3.6 MJ (useful for equating gas and electricity usage)
  - 1 litre of LPG contains about 26 MJ of energy
  - 1 kilogram of dry wood contains about 16 MJ of energy
  - 1 litre of petrol contains about 34 MJ of energy

Measuring Energy Usage In Your Business - ©TCFWA 2014 All rights reserved

Energy usage load assessment

- See where energy is being used within your business
- Everything that uses energy is recorded
- Professional energy auditor can be required

Data collection:

- **Category** - Lighting, Heating Ventilation & Air Conditioning (HVAC), Hot Water, Office, Kitchen, Other, etc.
- **Description**
- **Quantity**
- **Load (Watts)** - power consumption from nameplate rating or other source.
- **Usage (hours)**
- **Duty cycle** - percentage of usage time that item is actually drawing full power for
- **Total consumption (kWh)** - calculated based on the above inputs

Measuring Energy Usage In Your Business - ©TCFWA 2014 All rights reserved

Energy usage load assessment

STEP 1 - Tabulate all items and their usage

Category	Description	Qty	Watts	Hrs/day	Days/yr	Duty	kWh/yr
Lighting	Twin T8 Fluorescent	10	90	10	250	1	2,250
Lighting	Halogen Downlight	5	65	8	250	1	650
HVAC	Reverse Cycle AC	1	3200	8	250	0.5	3,200
Office	Desktop computer	3	120	8	250	1	720
Equipment	Sewing machine	6	150	8	250	0.5	900
TOTAL							7,720

STEP 2 - Compare to electricity bills

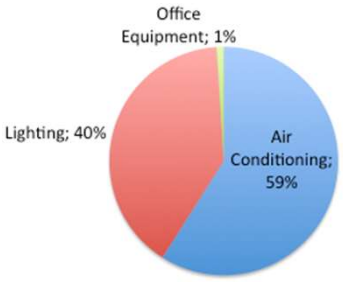
- Compare estimated total for your site to your actual energy usage shown on electricity bills
- Fairly accurate assessment of usage: numbers within about 10% of each other
- Create a pie chart to summarise the energy using areas in your business

Measuring Energy Usage In Your Business - ©TCFWA 2014 All rights reserved

Typical energy usage in TCF businesses

Case Study 1: Fashion retailer with street frontage

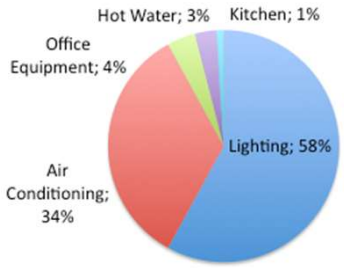
- This business spends about $8,000 per annum on electricity. More than half of the electricity consumption is by air conditioning, with most of the remainder by shop lighting.



Measuring Energy Usage In Your Business - ©TCFWA 2014 All rights reserved

Typical energy usage in TCF businesses

Case Study 2: Warehouse style shoe retailer



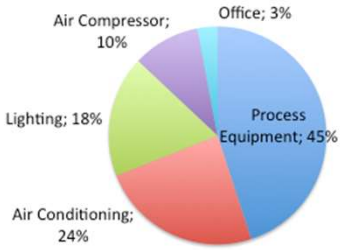
- This business spends about $17,000 per annum on electricity. Most of the bill is for lighting and air conditioning.

Measuring Energy Usage In Your Business - ©TCFWA 2014 All rights reserved

Typical energy usage in TCF businesses

Case Study 3:
Design and T-shirt screen-printing business

- This business spends about $23,000 per annum on electricity. The majority of this usage is by specialised printing equipment



Measuring Energy Usage In Your Business - ©TCFWA 2014 All rights reserved

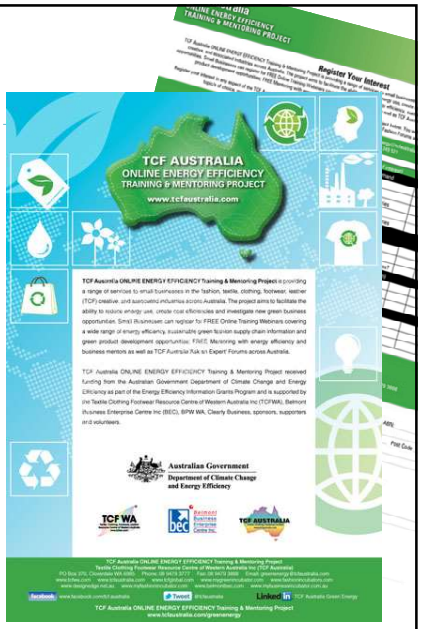
SEE ALSO…

- **Monitoring your Energy Bills in Your Business**
  identify problems, reduce costs & energy use in TCF Industries
- **Tips on Saving Energy in Your Business**
  tips to reduce energy usage, develop energy strategies
- **Energy Efficiency Accreditation**
  tips in behavioural, low & no-cost initiatives & business accreditation
- **Energy Usage in your Supply Chains – Upstream & Downstream**
  clean energy innovations, technologies & grants

www.tcfaustralia.com/calendar

Measuring Energy Usage In Your Business - ©TCFWA 2014 All rights reserved

TCF AUSTRALIA Online Energy Efficiency Project



WEBINARS VOUCHER

- Think Green & Start Saving $
- FREE Webinar from the TCF AUSTRALIA GREEN ENERGY series*

MENTORING

- Get Advice & Start Saving $
- FREE Mentoring session with a TCF AUSTRALIA GREEN ENERGY expert*

FREE ACCESS TO FORUMS

- Meet Experts & Start Saving $
- FREE Access to the TCF AUSTRALIA GREEN FASHION 'Ask An Expert' Forums*

www.tcfaustralia.com/greenenergy

*Conditions apply to eligible small businesses. Complete the form on www.tcfaustralia.com/greenenergy to apply.

TCF AUSTRALIA
ONLINE ENERGY EFFICIENCY
TRAINING & MENTORING PROJECT
www.tcfaustralia.com

Presented by **Steplight**
For TCF Australia
support@tcfaustralia.com

Textile Clothing Footwear Resource Centre of WA (TCFWA) | www.tcfwa.com
TCF Australia | www.tcfaustralia.com
TCF Global | www.tcfglobal.com
Designedge Fashion Incubator | www.designedge.net.au
Belmont Business Enterprise Centre (BEC) | www.belmontbec.com

Address - PO Box 370, Cloverdale. WA 6985, Australia
E| info@tcfwa.com P| 08 9479 3777 F| 08 9479 3888