Subject S03: Solar Design

Handout – Calculating energy use and CO_2 emissions

Assessment of energy use

1) Look for kW.h use on bill

2) If this is not available a simple calculation can work it out

Step 1: Calculate annual supply and charges:

Formula:

- Total supply and charges = Summer bill + autumn bill + winter bill + spring bill
  (most customers can remember their last bill)

Example:

- Total cost = $450 + $400 + $550 + $550
  = $1,950 per year

Step 2: Calculate supply charges:

ActewAGL prices for domestic and commercial:

Year	Domestic (inc GST)		Commercial (inc GST)	
	Daily supply charge	c/kW.h charge	Daily supply charge	c/kW.h charge
2016-2017	$0.8041	$0.18282/kW.h	$1.1660	$0.23265/kW.h
2017-2018	$0.9614	$0.21758/kW.h	$1.3420	$0.27016/kW.h
2018-2019	**$1.0725**	**$0.25036/kW.h**	**$1.4685**	**$0.30558/kW.h**

Formula:

- Supply charges = Annual supply and charges – (Daily supply charge x 365.25)

Example:

- Total cost = $1,950 per year – (**$1.0725** x 365.25) =
  = $1,950 - $391.73
  = $1558.27

Step 2: Calculate annual kW.h used:

Formula:

- kW.h used = Supply charges / $/kW.h charge

Example:

- kW.h used = $1558.27 / $0.25036/kW.h
  = 6224.11 kW.h
  = 6.22 MW.h

Average house hold energy use can be estimated here:

https://www.energymadeeasy.gov.au/benchmark

Subject S03: Solar Design

Calculate CO_2 emissions

Indirect (scope 2) emissions factors from consumption of electricity purchased or lost from grid		
State, Territory or grid description	**Column 2 Emission factor kg CO_2-e/kWh**	**My notes**
New South Wales and Australian Capital Territory	0.82	ACT is currently at around 0.5 and will be 0.0 by 2020.
Victoria	1.07	Due to brown coal
Queensland	0.80	
South Australia	0.51	Due to wind and solar
South West Interconnected System in Western Australia	0.70	
Tasmania	0.19	Due to hydro
Northern Territory	0.64	

Reference: National Greenhouse and Energy Reporting (Measurement) Determination 2008, Compilation No.10, 1 July 2018

Formula:

- CO_2 emissions = kW.h used x emission factor in kg CO_2-e/kWh

Example:

- CO_2 emissions = 5426.34 kW.h x 0.82
  = 4449.6 kg CO_2
  = 4.45 tonnes of CO_2 (over four ten metre high balls of thick smoke)