

Renewable Energy

The United Nations established REN21 to monitor international trends in renewable energy and the latest figures are shown below. The amount of electric power generated using hydropower, biopower, geothermal, solar PV, concentrating solar thermal and wind power plants for 2014 and 2015 is shown. The Australian Renewable Energy Agency (ARENA) was set up in 2012 to improve the competitiveness of renewable energy technologies and to increase the supply of renewable energy in Australia. REN21 figures show a different mix of renewables than ARENA estimated when it was set up. For example, the REN21 shows 4.3 GW capacity in concentrated solar power in 2014 that grew by 10% to 4.8 GW in 2015, whereas ARENA expected an annual growth of 25% per annum, barely reaching 4 GW global capacity by 2015. REN21 also reports on “Heat”, an energy source not considered by ARENA.

RENEWABLE ENERGY INDICATORS 2015			
		2014	2015
INVESTMENT			
New investment (annual) in renewable power and fuels ¹	billion USD	273	285.9
POWER			
Renewable power capacity (total, not including hydro)	GW	665	785
Renewable power capacity (total, including hydro)	GW	1,701	1,849
 Hydropower capacity ²	GW	1,036	1,064
 Bio-power capacity ³	GW	101	106
 Bio-power generation (annual)	TWh	429	464
 Geothermal power capacity	GW	12.9	13.2
 Solar PV capacity	GW	177	227
 Concentrating solar thermal power	GW	4.3	4.8
 Wind power capacity	GW	370	433
HEAT			
 Solar hot water capacity ⁴	GW _{th}	409	435
TRANSPORT			
 Ethanol production (annual)	billion litres	94.5	98.3
 Biodiesel production (annual)	billion litres	30.4	30.1
POLICIES			
Countries with policy targets	#	164	173
States/provinces/countries with feed-in policies	#	110	110
States/provinces/countries with RPS/quota policies	#	98	100
Countries with tendering/ public competitive bidding ⁵	#	60	64
Countries with heat obligation/mandate	#	21	21
Countries with biofuel mandates ⁶	#	64	66

International trends in renewable energy, from <http://www.ren21.net>

About Waste Heat

The Australian Renewable Energy Agency (ARENA) focuses on renewables for industrial processes, which accounted for around 40% of the total energy consumed in Australia in 2012-13. Nearly 70% of the energy was consumed in the manufacturing industry, where natural gas was used for heating, ref <http://arena.gov.au/funding/investment-focus-areas/renewables-for-industrial-processes/>.

ARENA projects focus on finding a renewable alternative to natural gas, rather than improving the efficiency of heat usage within industry. In particular there is no emphasis on the use of waste heat, which is released to the atmosphere through stacks, vents, flares and mechanical equipment.

It is important to note that the underlying technology utilised in geothermal energy generates electricity from low-level heat, which means it is also suitable for generating electricity from industrial waste heat. The development of geothermal energy is supported, but generating electricity from waste heat seems to have been overlooked by ARENA and the other government funding bodies in Australia, so it is very difficult to establish projects specifically targeting waste heat.

Projects that generate electricity from waste heat are significantly different to other renewable energy projects because waste heat is available whenever the industrial process is operating. Many industrial processes operate 24 hours per day, every day of the year, meaning that electricity can be generated continuously. Waste Heat to Power (WHP) is the process of recovering waste heat and using it to generate power with no combustion and no emissions. WHP helps reduce energy costs for industrial processes by generating emission-free electricity to sell to the grid.

Around the world there is a great deal of interest in WHP to minimise carbon emissions and create jobs. The peak body in the USA maintains a very informative website at <http://heatispower.org>. WHP should also be promoted in Australia.

Further information:

Dr Robert White

Director, Technical Insight Pty Ltd

website: <http://technicalinsight.com.au>