Victoria's Energy Mix 2000 - 2009

Introduction

Green Energy Markets Pty Ltd has been engaged by Environment Victoria to undertake a review of Victoria's electricity generation mix over the last 10 years and to ascertain the resultant level of Greenhouse Gas Emissions.

Summary of Results

Victoria's electricity generation has historically been dominated by coal-fired generation and whilst renewable generation has made important inroads over the last few years it still accounts for only 5% of Victoria's generation in 2009, the same share of generation as in 2000.

While coal-fired generation has reduced its overall market share of generation by 1%, it still dominates electricity generation at 92% of total generation. In absolute terms, Victoria's reliance on coal has increased over the past decade with 51,697GWh of electricity generated from coal in 2009, up by 9 percent on 2000 levels.

Gas-fired generation has fluctuated considerably over the last 10 years in response to market conditions and the recent addition of new generation plant.

Renewable energy has historically comprised predominantly of hydro-electric plants, however hydro's contribution has reduced somewhat over the last few years due to lower rainfall and reduced storages. Wind energy is now the largest source of renewable energy accounting for 34% of renewable generation in 2009. The growth in wind energy has effectively replaced the decline in hydro energy.

Table 1 - Generation Summary ('000 MWh)

Year	Coal fired Generation	Gas Fired Generation	Renewable Generation	Grand Total	Coal Market Share
2000	47,242	1,150	2,258	50,649	93.3%
2001	48,776	1,241	2,694	52,711	92.5%
2002	49,765	802	2,592	53,159	93.6%
2003	49,768	437	2,794	52,999	93.9%
2004	51,739	1,601	3,143	56,483	91.6%
2005	50,108	553	2,382	53,043	94.5%
2006	51,445	821	2,944	55,210	93.2%
2007	50,137	3,545	2,968	56,650	88.5%
2008	51,386	2,242	2,431	56,059	91.7%
2009	51,697	1,688	3,091	56,476	91.5%
Grand Total over 10 years	**502,065**	**14,078**	**27,296**	**543,439**	**92.4%**
% Increase over 10 years	**9.4%**	**46.8%**	**36.9%**	**11.5%**	

Reflecting the dominant position that coal holds in Victoria's generation mix, greenhouse emissions from electricity have increased by 10% over the 10 years to 2009 – a total of 6 million tonnes. Coal-fired generation accounts for 98% of emissions from electricity.

Table 2 - Emissions Summary ('000s tonnes)

Year	Coal fired Emissions	Gas Fired Emissions	Renewable Emissions	Grand Total	Coal Market Share
2000	57,373	737	0	58,111	98.7%
2001	59,395	745	0	60,139	98.8%
2002	60,682	497	0	61,179	99.2%
2003	60,670	284	0	60,954	99.5%
2004	62,856	1,004	0	63,860	98.4%
2005	60,892	336	0	61,227	99.5%
2006	62,464	507	0	62,971	99.2%
2007	60,899	2,324	0	63,223	96.3%
2008	62,441	1,468	0	63,909	97.7%
2009	62,897	1,090	0	63,987	98.3%
Grand Total over 10 years	**610,569**	**8,991**	**0**	**619,560**	**98.5%**
% Increase over 10 years	**9.6%**	**47.8%**		**10.1%**	

Methodology

Scheduled generation data for each of the larger power stations has been sourced from the Australian Energy Market Operator (AEMO) formerly the National Electricity Management Company. Generation data for the smaller non-scheduled renewable generators (including all wind farms operating in Victoria) has been derived through the level of renewable energy certificates created under the Commonwealth and Victorian Renewable Energy Targets and then adjusting these for 1997 baselines. Victoria's 29 per cent share of Snowy Hydro's output has been included each year as renewable generation in Victoria.

Smaller non-scheduled gas-fired generators (predominantly cogeneration plants) operating in Victoria amount to around 130 MW and contribute less than 1 per cent of electricity generation. However the exact level of generation from these plants cannot be accurately determined and has therefore been excluded from this analysis. Greenhouse emission factors have been applied to fossil fuel generators based on their annual level of generation. The factors have been sourced from ACIL Tasman's report to NEMMCO.

Figure 1 - Victoria's Energy Generation Trends

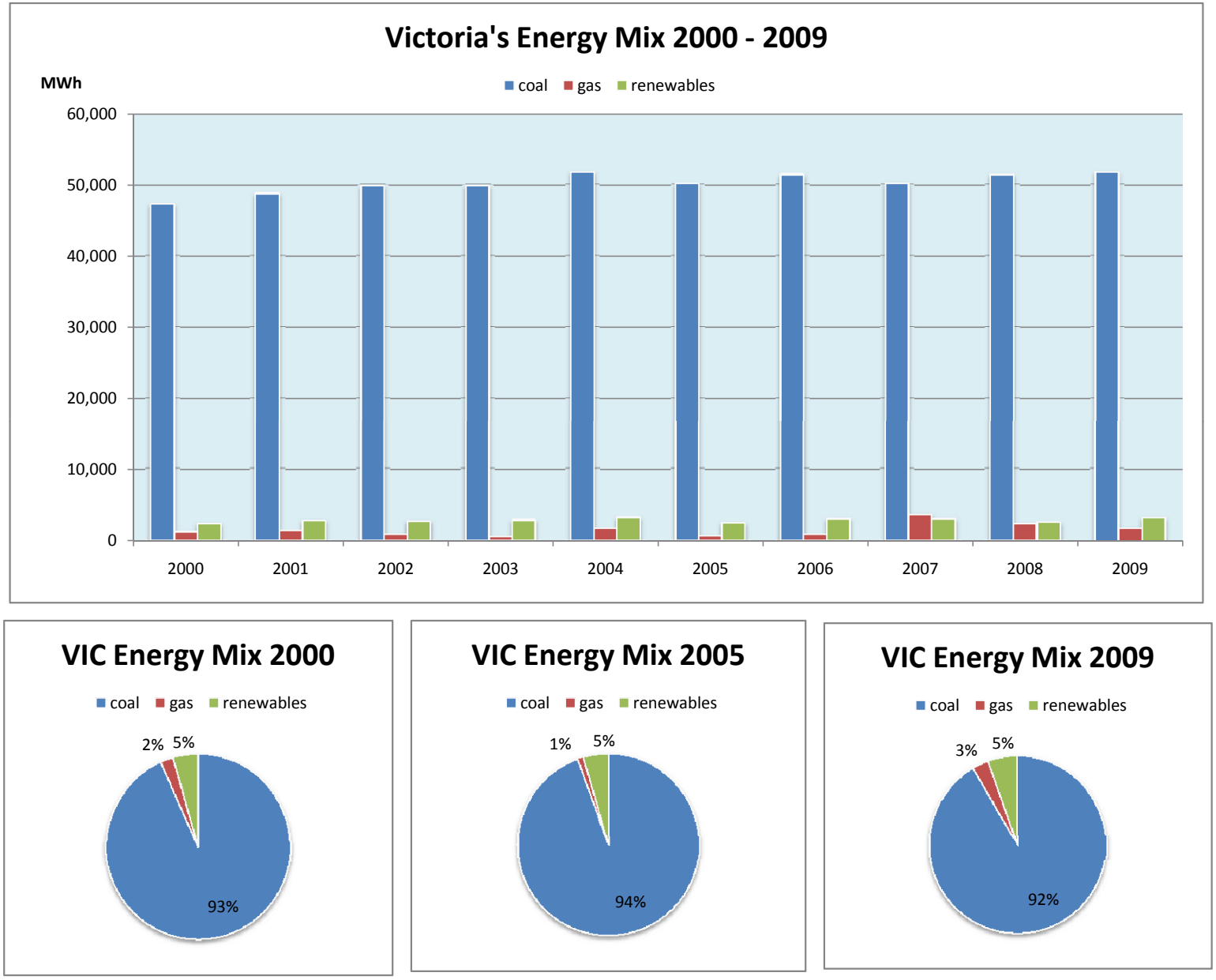

Figure 2 - Victoria's Emissions from Energy Trends