

Ontario Wind Farm Productivity and Variability by In-service Year

By Tom Adams

January 5, 2010

The capacity factors and standard deviations of the electricity production of Ontario's largest wind farms completing at least one full year of service are as follows:

Wind Farm Productivity and Variability by In-service Year

Wind Farm	Capacity Factor by in-service year			Standard deviation per unit of capacity		
	yr 1	yr 2	yr3	yr 1	yr 2	yr3
Amaranth I	27.6%	29.9%	*	27.0%	28.1%	*
Amaranth I&II	24.6%			24.3%		
KINGSBRIDGE	31.1%	33.9%	32.9%	30.4%	33.1%	31.7%
PRINCEFARM	28.2%	28.1%	20.5%	28.1%	27.5%	
PTBURWELL	28.6%	26.8%	29.5%	29.2%	29.1%	29.5%
RIPLEY SOUTH	32.3%	29.8%		28.4%	29.7%	
Port Alma	37.2%			33.4%		

*Amaranth II went into service in November 08 causing data mixing in yr3.

It appears that the variability of output is greater for more productive wind sites. In scanning the data, it is obvious why this is the case. The more productive wind farms have similar numbers of hours of little or no output but greater numbers of high output hours as compared with their less productive peers.

Archer and Jacobson have suggested that standard deviation is not the correct measure of intermittency. Instead they posit the ratio of standard deviation divided by the mean as the correct measure of intermittency.¹ The logic of the Archer and Jacobson position is that a 1 MW variation from a higher output generator has lesser impact on the grid than if the same 1 MW variation was delivered from

¹ http://www.stanford.edu/group/efmh/winds/aj07_jamc.pdf

a lower output generator. In reality, the impact of generator variability on the grid is unrelated to average output of that generator.