Response to American Wind Energy Association comment on:

"CO$_2$ avoidance cost with wind energy in Australia and carbon price implications"

http://bravenewclimate.com/2011/05/21/co2-avoidance-cost-wind/#comment-128003

Michael Goggin, American Wind Energy Association, on 23 May 2011 at 3:38 AM said:

> *Hi guys,*
>
> *This myth that wind energy doesn't significantly reduce emissions has already been conclusively shot down – the data and studies are summarized here and here:*
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> *http://archive.awea.org/newsroom/pdf/04_05_2010_Colorado_emissions_response.pdf*
> *http://www.renewableenergyworld.com/rea/news/article/2010/09/the-facts-about-wind-energy-and-emissions*
>
> *It's unfortunate to see the paper by Inhaber being given any credibility at all. If you actually look at Inhaber's paper you'll see that it's just an anti-wind diatribe that summarizes previous fossil-funded attacks on wind energy. It simply cobbles together things like the fossil lobby's discredited Bentek report and anti-wind letters to the editor in obscure newspapers to make equally unsupported attacks on wind energy.*
>
> *Michael Goggin*
> *American Wind Energy Association*

I take heart that the AWEA challenges the Inhaber equation rather than my method of calculating the cost per tonne CO2 avoided and the carbon price needed to get investment in wind power if it is not mandated by regulation. This encourages me to believe that the calculation methodology I applied is correct and it is only the Inhaber equation, or the constants for that equation (200 and 0.2), that AWEA is challenging.

This is encouraging because we can explore the AWEA criticism further. What does AWEA suggest would be appropriate constants to replace the 200 and 0.2 in the Inhaber equation? If AWEA rejects use of such an equation completely, simply provide me a with figure to use instead of 3.6% (for the proportion of CO2 avoided by wind energy at 20% energy penetration).

To illustrate what I am getting at, suppose AWEA says the 3.6% figure should be replaced by 20%, or 50% or 80% or whatever AWEA can justify (for the proportion of CO2 avoided by wind energy at 20% energy penetration) then the cost per tonne

CO2 avoided, and the carbon price that would be needed to cause investment in wind power at 20% penetration in the absence of regulations to force it, are calculated to be as listed in Table 1 and graphed in Figure 1. (These figures are for the Scenario 1 assumptions).

Table 1: CO_2 avoidance cost and carbon price versus % emissions avoided

CO2 avoided (%)	3.6%	20%	50%	80%	90%
t/MWh reduction	0.036	0.200	0.500	0.800	0.900
Cost per tonne CO2 avoided ($/t)	$2,502	$450	$180	$113	$100
Average wholesale electricity price	$30	$30	$30	$30	$30
Carbon price required	$2,472	$420	$150	$83	$70
Carbon price multiplication factor	99	17	6	3	3

Figure 1:

Carbon price required versus % emissions avoided per MWh of wind generation
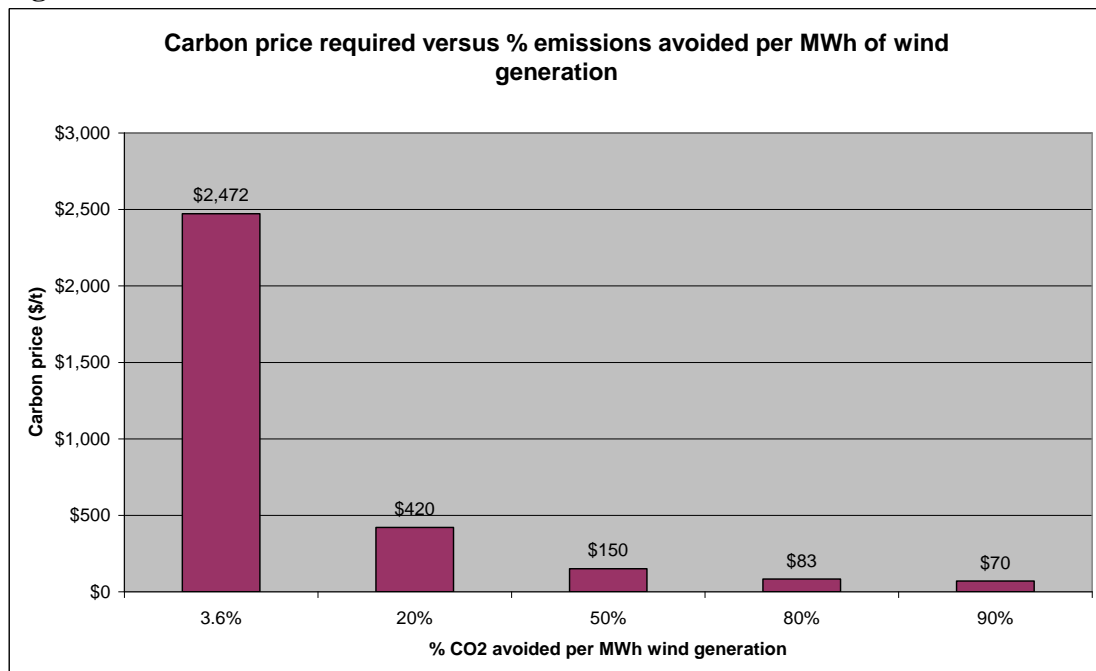
Therefore, instead of the carbon price being one-hundred times higher than the proposed starting price ($25/tonne) it would be only 17, 6 or 3 times higher for 20%, 50% or 80% CO_2 avoided per MWh of wind generation. All of which are unjustifiable.

This confirms the conclusions in the working paper are robust. More specifically, it confirms:

1. wind power is a very high cost way to reduce CO_2 emissions
2. wind power becomes less economic as its penetration increases
3. a carbon price will not make wind power viable in the absence of regulations to mandate it
4. it is the regulations ("picking winners") that is forcing wind power on us

On the basis of this, I'd suggest we can stop worrying about the uncertainties in the Inhaber equation. No matter what figure AWEA proposes (that they can defend based on empirical evidence), it will demonstrate these conclusion are correct and robust.

The conclusion is clear: wind energy is an appalling waste of our wealth and resources. It is one of the worst cases of governments attempting to pick winners.