

What is the benefit of TASG Advancements?

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14/June/2007

Benefits of TASG Advancement

1. Carbon benefit

You advance 1MW of Wind generation by 12 months in Scotland:

- At 35% load factor, it generates for $8760 \times 0.35 = 3066\text{hr}$; = 3GWh
- This offsets $3\text{GWh} \times 0.43\text{T_C/MWh} = 1.3 \text{ kT_C}$
 - (DTI ‘official average is 0.43 T_C per MWh of electricity; use of this average sidesteps arguments whether Coal or Gas is displaced.)
- At a ‘target’ price of 15 £/TC, this represents a monetary saving of $1.3 \times 15 = \text{£}20\text{k pa}$, in saved Carbon

Benefits of TASG Advancement

2A. Reduction in Energy Price

There are two lines of argument here:

- Current wholesale energy price varies from
 - ~15 £/MWh at minimum load of 20GW; to
 - ~55 £/MWh at maximum load of 60GW
- Hence the slope of the Capacity : Energy_Price curve is $40 \text{ £/MWh} \div 40\text{GW} = 1 \text{ £/MWh per GW}$
- Thus 0.35 extra MW of 'free' Wind generation reduces wholesale price by 0.00035 £/MWh
- Benefit = $350\text{TWh} \times 0.00035 \text{ £/MWh} = \text{£}110\text{k}$

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2B. Reduction in Energy Price = Zero

There are two lines of argument here:

Alternative line of argument is that:

- Wholesale Energy Market is entirely efficient; hence energy price clears to the marginal fuel price at all times
- Currently, on an annual basis, marginal fuel is new-build CCGT; over a range from -10GW to $+5\text{GW}$ of Δ generation
- Hence impact on Energy Price of 1MW of advanced Wind = Zero

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2C. Impact on ROC Market

- The ROC market is set up to re-calculate to the same total cost, whenever the supply of ROCs is less than the requirement
- Hence +3GWh of extra Wind neither reduces nor increases the total cost of ROCs borne by Suppliers = Consumers.

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3. Cost of Extra Constraints

- A 'generic' Scottish Constraint cost is currently 100 £/kW pa:
 - This represents +1kW of base-load generation, × 1700 hours of Constraints caused (1/5th of the year), × 60 £/MWh average Constraint price
- Hence +1MW of advance Wind causes 350KW (average output) × 100 £/kW = +£35k of extra Constraint cost

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3. Cost of Extra Reserve+Response

- We are on record, that the extra Reserve costs of Wind generation $\sim 2 \text{ £/MWh}_{\text{wind}}$ by 2010
 - (This may be an under-estimate, since we derived this estimate before recent rises in the prices of Reserve and Response)
- Thus cost of extra Reserve = $3\text{GWh} \times 2 \text{ £/MWh}$
= +£6m. Say +£10m to allow for above

SUMMARY

Benefit of 1MW of TASG Wind Advancement =

- +£20k (carbon saving)
- +£0–110k (Energy Market saving – contentious)
- –£35k ('generic' Scottish Constraint cost – very sensitive to hours of Constraint caused)
- –£10k (cost of extra Reserve)

Total = –£25k of dis-benefit; to +£85k of benefit
(dependent on your view of Energy market benefit)