



January 27, 2012 vAa

Memo to : Hélène Lavray / Jean Guy Bartaire Eurelectric
from : Frans van Aart KEMA
Subject : Remarks on 'Update of Cost Estimation for LCP' EGTEI

KEMA has reviewed the Working document for the meeting of 31 January 2012 'Update of Cost Estimation for LCP' dated January 20, 2012.

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Several abbreviations are missing ao. civ, cif, LCP
Where is 'i:country' used?

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Total investments cost also include owners cost, contingency, permits and insurance.
In a techno-economic analysis the WACC is used to annualize the investment cost, see page1 from previous memo (73100024-PGR/CFP 2011). WACC is higher than 4%

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The wages should be in the fixed cost, not in the variable cost, since they are independent of the operating hours.

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Technical lifetime is not given. Suggestion done in previous memo (73100024-PGR/CFP 2011)

1st URL link, referres to an index for industrial production on short term (only 1 year back).
Mostly data is needed that goes back for several years. And the industrial production is not a perfect match for power plant investments.

2nd URL link, referres to industrial producer prices, this should not be used for indexing power plant investments.

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E9 required abatement efficiency = $1 - \text{Conc}_{\text{so2,ELV}} / \text{CONC}_{\text{so2, rev}}$

CONC_{so2, reg} does not come back in E9

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Chemical formula is wrong

Please specify investment function from EGTEI methodology [3]. Without this function it is not possible to validate the coefficients of table 1.

Paragraph 3.4 should be based on the function given in the previous memo (73100024-PGR/CFP 2011). Erroneously the term exponential is used in this memo, this should be power, since the formula is a power function. This function cannot be transferred into an exponential function, it could be transferred into a logarithmic function. Please note that this function is based on total investment cost and not on specific investment cost.

When the following values are used (based on IEA data from Figure 1)

- Cap1 = 1000
- Cap2 = 4000
- $I_{cap1} = 140 \cdot 1000 = 140\,000$
- $I_{cap2} = 90 \cdot 4000 = 360\,000$

Then exponent p should be 0.68, which is between 0.6 and 0.7.

With this formula it should not be necessary to differentiate typical ranges of size of installation.

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1.25 t CaCO₃/t SO₂ is too low. Accordingly to the theory stated in the first sentence of paragraph 3.5 this number should be higher.

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4% seems to be too much, even when wages are included in the fixed cost.

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E1 required abatement efficiency = $1 - \text{Con}_{\text{CNox,ELV}} / \text{CONC}_{\text{Nox, rev}}$

Average baseload emission levels seems to be high

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Please specify investment function from EGTEI methodology [3]. Without this function it is not possible to validate the coefficients of table 3 and 4.

Cost functions should not be linear, but accordingly to the function given in the previous memo (73100024-PGR/CFP 2011)

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Accordingly to theorie stoichiometry should be 1.0, and thus NH₃ consumption is higher

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Catalyst regeneration cost seems to be high.