

EGTEI methodology: Update of costs for LCP

Draft minutes of fourth meeting of 5 February 2013

Participants:

Name	Organisation	Country
Nadine ALLEMAND	CITEPA, EGTEI technical secretariat	FR
Jean-Guy BARTAIRE	EIGTEI co chairman	FR
Roger BRANDWOOD	EON	UK
Nicolas CARAMAN	EDF	FR
Paul DE MATHAN	EDF	FR
Daniel LADANG	TOTAL	BE
Simon SCHULTE BEERBUEHL	DFIU, EGTEI technical secretariat	DE
Ann-Kathrin MUELLER	DFIU, EGTEI technical secretariat	DE
Koen SMEKENS	ECN	NL

Excused: François-Xavier DUSSART (GE, FR), Emmanuel FIANI (ADEME, FR), Tiziano PIGNATELLI (ENEA, EGTEI co chairman), Pete ROBERTS (CONCAWE, BE), Andreas WECKER (VGB, DE), Heimo FRIEDE (Siemens, DE), Florian BOEGER (EU Turbines, BE), Belen BRAVO (EUROFER, BE), H  l  ne LAVRAY (EURELECTRIC, BE), EIPPCB

Diffusion: As above + persons interested to follow the work:

Frans VAN AART (KEMA, NL)

Objectives of the meeting

The objectives of the meeting were to examine the state of progress of the work by the technical secretariat CITEPA and KIT, respectively for SO₂ / PM (CITEPA) and NO_x (KIT).

A series of slides for discussion was prepared by the technical secretariat and discussed during the meeting in order to progress in the estimations (presentation ppt joined to these minutes (SO₂- PM and NO_x)).

Main results of the discussions

4 questionnaires have been received. The extension of the deadline has not enabled to receive a larger number of filled questionnaires.

SO₂-PM

It seems that additional information could be sent by some experts just focusing on key questions such as investments.

Slides SO₂-5 to SO₂-13 investments for FGD with limestone forced oxidation.

Investments collected for 4 plants are dispersed. Explanations are tentatively provided. Year of construction: plant A the most recent and possible impact of the learning effect, influence of the sulphur content of fuels. Too low number of examples to develop robust explanation.

Richard Brandwood estimates that retrofit costs are linked to the surface available and civil work to be done. No information is available from data collected. The costs data provided in the questionnaire do not give any information.

Several investment points have been gathered to try to derive a cost function. The cost function is not yet satisfactory. It is recommended to distinguish individual investment from data already modeled coming from USA EPA or other sources. Other mathematical types of functions have to be investigated.

EDF will try to provide other cost information focusing only on investments.

Slides SO₂-14 to SO₂-21 limestone consumption:

For limestone consumption, the current EGTEI assumptions are coherent with data collected. The consumption will be adjusted considering the purity of the limestone (around 95 %). A ratio of 3 exists in the costs of limestone in Europe.

Slide SO₂-22 water consumption:

Tentatively, the water consumption provided in the questionnaire has been reported to the limestone consumption. Results obtained are not coherent and give very different order of magnitude (between 7 to 8 m³ water/t reagent for two cases compared to 21/24 m³ water/t reagent for two other cases). It is proposed to check the proportion of costs due to water consumption in the operational costs and to try to take into account if important, the characteristics of the inlet and outlet flue gas in term of temperature and moisture.

Slides SO₂-23 to SO₂-25 waste disposal:

The current EGTEI estimation of waste generated is correct. To be adapted with conclusion on purity of limestone.

Slides SO₂-26 to SO₂-27 electricity consumption:

The capacity of fans and auxiliary equipment ranges from 1 to 3.6 %. More pumps than needed are often installed. It is asked to check again the consumption related to the pressure drop. Conclusions will be done after.

Slides SO₂-28 and SO₂-29 wages and fixed operating costs:

Wages will be included in fixed operating costs. Make the figures variables in the tool. 4 % by default.

Slides SO₂-30 investment of LSFO for liquid fuel plants:

Very rare data. The current EGTEI hypothesis will be kept (ratio compared to coal using the waste gas ratio)

NOx:

Slides NOx1-NOx11:

Results of the questionnaire have been presented and current gaps have been named. Data for SCR has been relatively much and values are in expected ranges, whereas data for SNCR and LNB has been very rare and widely spread.

Slide NOx-4:

As a rule of thumb, SCR stoichiometric ratio of 1.05 has been suggested. For coal plants, a stoichiometric ratio of 0.8 shall be used.

Slide NOx-5:

As a rule of thumb, a SNCR abatement efficiency of 30% corresponds to a stoichiometric ratio of 1. This shall be implemented in the Excel tool.

Slide NOx-9:

For more SCR investment data, the publicly available studies of IEA (Hermine Nalbandian) and E.On (Roger Brandwood) have been found as suitable.

Slides NOx-12 – NOx-20:

A raw version of the Excel implementation including its basic assumptions and its calculation results has been presented.

Slide NOx-16:

Unburnt carbon (UBC) mass fractions of 2-7% have been suggested to use instead of current “Loss on Ignition” figures, as UBC is measured to ensure fly and bottom ash salability.

Next steps:

For mid/end June: Finalise FGD LSFO, FF, ESP, SCR, SNCR and LNB for coal plants and liquid fuel plants

For October: finalise FGD by dry injection and FF, for coal plants and fuel plants

Finalise cost estimation for co-combustion plants

Gas turbine.

Next meeting: Paris (CITEPA office) on 27 June 2013