EGTEI

ENERGY SECTOR

Test for the Power Generation (LCP > 500 MWth)

Objective of the LCP2030 sub-group

Provide technical and economical information for modelling work on:

ØNew technologies and abatement techniques

ØImprovement:

- **New applications of existing abatement techniques**
- **Technical improvements of existing technologies and abatement techniques**

Objective of the LCP2030 sub-group

Focus on:

ØLCPs > 500 MWth

ØPrimary and secondary measures

ØPM, SOx, NOx and CO_2 abatement

Estimate the CO_2 emissions due to abatement techniques

October 1st meeting conclusions

Ranking of the technologies and techniques (first priority, secondary, cancelled)

Expected contributions listed:

Ø from LCP2030 members

Ø from other experts

Frame of contributions finalized (with guideline document)

Schedule

January 25th 2008: **3rd LCP2030 meeting in Brussels**
- **presentation of contributions**
- **planning of other contributions and interview of other experts**

March 2008: **finalize contributions**

April 2008: **presentation of a draft to the WGSR**

May 2008: **4th LCP2030 meeting (in Poland ?)**

June 2008: **finalize document in English**

September 2008: **(translate the document in Russian and French if resource found and present it to the WGSR)**

New schedule

End of February	**Contributions expected**
March 17th 2008	**4th LCP2030 meeting (CITEPA - Paris)**
March 2008:	**finalize contributions**
April 28th 2008	**5th LCP2030 meeting (Stockholm)**
April 2008:	**presentation of a draft to the WGSR**
June 2008:	**finalize document in English**
September 2008:	**(translate the document in Russian and French if resource found and present it to the WGSR)**

List of emerging technologies (first priority)

Technology prioritised by the sub-group	Comment	Contributor
Lignite predrying with low temperature heat	first priority due to importance in Germany (CO2); VGB document	VGB
Low grade coal pre-processing	added to the list as a priority; US-technology; maybe interesting for Poland	BOT?
Underground gasification of coal	added to the list as a priority; Australian technology; maybe interesting for Poland	BOT?
IGCC (coal)	considered as still emerging as not yet commercial even though two plants (Netherlands, Spain) exist	IFARE, EDIPOWER, EDF, BOT?
IGCC (biomass)		EDF?, Sweden?
Co-Combustion (Waste/Biomass)		EDIPOWER, EDF?, EnBW?
Oxycombustion		IFARE, VGB

List of emerging abatement techniques (first priority)

Technique prioritised by the sub-group	Comment	Contributor
SO2		
Flowpac	only 1 pilot plant (ALSTOM)	IFARE, Sweden?, ALSTOM?
Limestone Injection Dry Scrubbing (LIDS)		IFARE
Duct Sorbent Injection - Coolside	mostly smaller plants or plants operating 2000-3000 h/year	IFARE, VGB, BOT
NOx		
Oxygen Enhanced Low-NOx Technology	given higher priority	AIR LIQUIDE?
Oxy-fuel combustion	added to the list with first priority; also VGB document?	EDIPOWER (Babcock UK, ENEL?), AIR LIQUIDE?
Oscillating Combustion		CITEPA (Pillard?)
Dual fuel combustion	added to the list with first priority; example in Japan (VGB?)	?

List of emerging abatement techniques (first priority)

Technique prioritised by the sub-group	Comment	Contributor
SOx+NOx		
CFB (flue-gas recirculating fluidized bed)	changed from Lurgi CFB; given higher priority	ALSTOM, Lurgi, EDF/SNET?
US gas-phase oxidation process	given higher priority	(BREF Ref)
Limestone Injection Multistaged Burner (LIMB)		IFARE
SOx-NOx-Rox-Box (SNRB)		IFARE
PM		
Advanced PM1 Agglomeration ESP / ultrasonic acoustic agglomeration	given higher priority; so far no plants in Europe but might be interesting in future; originally developed for nuclear plants	EDF?, VGB?, IFARE?
CO2 Capture and Storage (CCS)		ADEME

List of emerging applications of existing abatement techniques (first priority)

Technique prioritised by the sub-group	Comment	Contributor
SO3 injection (PM abatement)	formerly when ESP was not yet effective enough SO3 was injected; nowadays emerging for smaller PM ???	SNET? EDF? VGB? BOT

List of existing technologies improvement (first priority)

Technology prioritised by the sub-group	Comment	Contributor
Coal: Pulverised Coal (PC)		EDIPOWER, Czech Republic
Coal: Circulating Fluidised bed combustion (CFBC)		Belgium
Coal: Pressurised fluidised bed combustion (PFBC)		IFARE
Gas: Gas turbines		EDIPOWER
Gas: Gas fired boilers and heaters		Czech Republic
Gas: Combined cycle		EDIPOWER, EDF?
Gas: Co-generation (CHP)		EDIPOWER
Biomass: co-combution	added to the list with first priority	VGB?, EDIPOWER (waste)
Pulverized Coal Firing, (ultra) supercritical (PCF - USC)		IFARE
Pressurized Pulverized Coal Combustion (PPCC)		IFARE, VGB?
IGCC with tar gasification	added to the list with first priority	EDF?, BREF Refineries, CONCAWE?

List of existing abatement techniques improvement (first priority)

Technique prioritised by the sub-group	Comment	Contributor
PM		EDF?
Electrostatic precipitators (ESP)		EDIPOWER, Czech Republic, VGB?
Fabric filters (baghouses)		EDIPOWER, Czech Republic
Centrifugal precipitation (cyclones)		Czech Republic
Fuel exchange		Czech Republic
Burner exchange or combustor modification		Czech Republic
Reconstruction of boilers or stacks		Czech Republic

List of existing abatement techniques improvement (first priority)

Technique prioritised by the sub-group	Comment	Contributor
SO2		
Low sulphur fuels or fuels with basic ash		EDIPOWER, Czech Republic
Adsorbents in fluidised bed combution		Czech Republic
Wet lime/limestone scrubbers		EDIPOWER, Czech Republic
Jet bubbling reactor	added to the list with first priority	EDIPOWER
Spray dry scrubbers		Czech Republic
Furnace sorbent injection		Czech Republic
Duct sorbent injection (dry FGD)		EDIPOWER, Czech Republic
Magnesium oxide process		EDIPOWER
Fuel exchange		Czech Republic
Burner exchange or combustor modification		Czech Republic
Reconstruction of boilers or stacks		Czech Republic

List of existing abatement techniques improvement (first priority)

Technique prioritised by the sub-group	Comment	Contributor
NOx		
Air staging (burners out of service (BOOS))		EDIPOWER
Air staging (overfire air (OFA))		EDIPOWER
Flue-gas recirculation		EDIPOWER
Air-staged low NOx burner		EDIPOWER
Flue-gas recirculation low NOx burner		EDIPOWER
Selective catalytic reduction (SCR) for conventional burners		EDIPOWER, VGB, EDF?
Selective catalytic reduction (SCR) for gas combined cycle plants	added to the list with first priority	EGTEI expert (Austria)
Hybrid SCR and SNCR for conventional burners	not economic due to ammonia slip	EDIPOWER
Fuel exchange		Czech Republic
Burner exchange or combustor modification		Czech Republic
Reconstruction of boilers or stacks		Czech Republic

Work in progress

Contributions expected by the end of December

Contributions from:

- **IFARE (LIMB, SNRB, …)**
- **J-P RIVRON (Efficiency improvement, SCR, FGD from VGB document – data to be validated by VGB)**
- **ADEME (CO_2 capture)**

Thank you for your attention