

USE OF ALTERNATIVE FUELS AND MATERIALS IN THE EUROPEAN CEMENT INDUSTRY

ALF-CEMIND Study Tour

29-30 August 2007 - Maastricht

By Ir. Claude LOREA – CEMBUREAU Technical Director



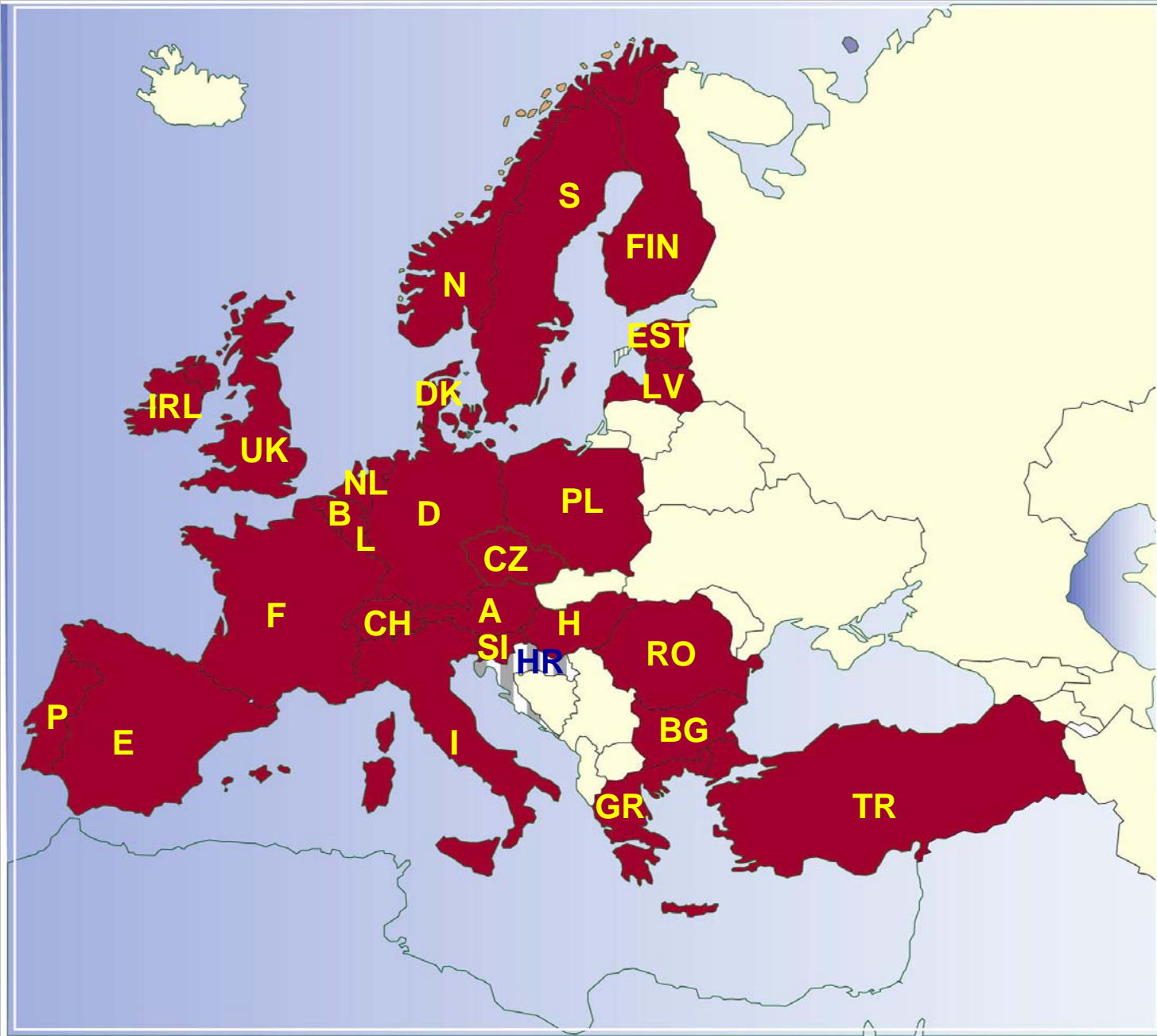
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FULL MEMBERS

AUSTRIA, BELGIUM,
 BULGARIA, CZECH REP.,
 DENMARK, ESTONIA,
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ALTERNATIVE FUELS IN THE CEMENT INDUSTRY

Homogeneous waste can be effectively recovered energetically and/or materially by co-processing in the cement - making process

- as alternative fuels (co-processing of waste)
- as alternative raw materials
- as mineral components

Co-Processing of Waste in Cement Kilns

Secondary fuels

Country	Permitted capacities for secondary fuels (t/y)			Amount of secondary fuels actually used (t/y)			% of resulting heat release					
	National Range		National Average	National Range		National Average	Haz. Waste			Non-haz. Waste		
	Min	Max		Min	Max		National Range		National Average	National Range		National Average
			Min			Max	Min	Max				
Austria ¹⁾	10,000	35,000	-	9,500	39,000	30,000	30%	54%	12%	15.0%	50.0%	35.0%
Belgium, Netherlands, Luxembourg	-	-	-	58,500	402,000	138,930	0%	25.0%	11.0%	21.0%	30.0%	24.0%
Czech Republic	-	90,000	-	-	-	40,000	0%	40%	15%	0.0%	100.0%	37.0%
Denmark, Finland, Sweden, Norway, Ireland	-	300,000	-	22,000	120,000	75,000	2.0%	20.0%	15.0%	24.0%	35.0%	32.0%
Estonia, Latvia, Poland, Hungary	15,000	380,000	125,000	8,000	67,369	27,271	13.4%	14.0%	13.7%	16.0%	26.1%	17.5%
France	12,500	265,000	-	300	113,000	37,374	0%	41.2%	14%	0.4%	52.0%	14.6%
Germany	-	-	-	-	218,157	56,857	0%	25%	5.2%	-	76.0%	43.6%
Greece, Portugal, Romania, Slovenia	20,000	500,000	20,506	640	60,000	9,196	0%	3.8%	0.7%	0.4%	15.6%	2.0%
Italy	5,000	115,000	28,000	5,300	90,600	13,100	1.3%	21%	12%	0.9%	37.0%	11.3%
Spain	8,800	100,000	43,000	2,000	36,000	15,500	0%	27.8%	4.8%	2.0%	25.0%	8.5%
United Kingdom	25,000	788,400	182,337	0	55,960	24,086	0%	27.6%	6.0%	0.0%	40.0%	7.8%

Above figures are aggregated from CEMBUREAU members' replies

Notes:

¹⁾ 2004 figures



STRICT REGULATION AT EU LEVEL

- IPPC Directive
- Incineration of Waste Directive (2000/76/EC)

of 4 December 2000 ... to be
transposed into national laws by
28 December 2002

! BOTH DIRECTIVES CURRENTLY UNDER REVISION

EMISSION LIMIT VALUES

The following emission limit values are provided for cement plants burning non-hazardous waste or less than 40% hazardous waste:

Total dust	30
Hydrogen Chloride (HCl)	10
Hydrogen Fluoride (HF)	1
NOx for existing plants	800
NOx for new plants	500
Cadmium (Cd) & Thallium (Tl)	0.05
Mercury (Hg)	0.05
Antimony (Sb), arsenic (As), lead (Pb), Chromium (Cr), cobalt (Co), copper (Cu), manganese (Mn), nickel (Ni), vanadium (V)	0.5
Dioxins and furans	0.1
Sulphur dioxide (SO₂)	50
Total Organic Carbon (TOC)	10

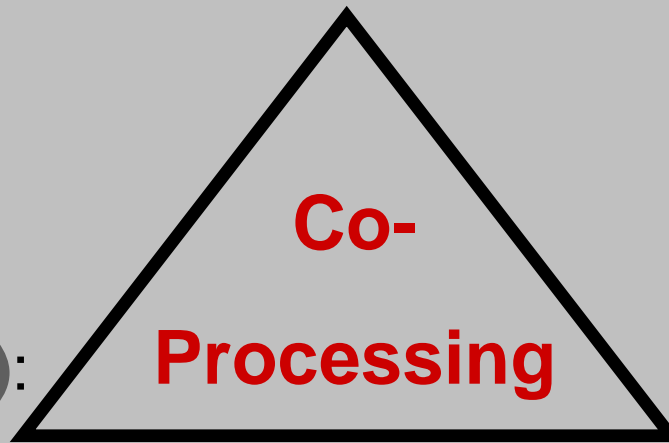
Exceptions may be authorised by the competent authority in case where TOC and SO₂ do not result from the incineration of waste

Limit values expressed as a daily average, 10% O₂, dry, mg/m³
(dioxins ng/m³)

A WIN/WIN/WIN SITUATION

Ecology (PLANET):

An environmentally sustainable waste management and important saving of natural resources



Industry (PROFIT):

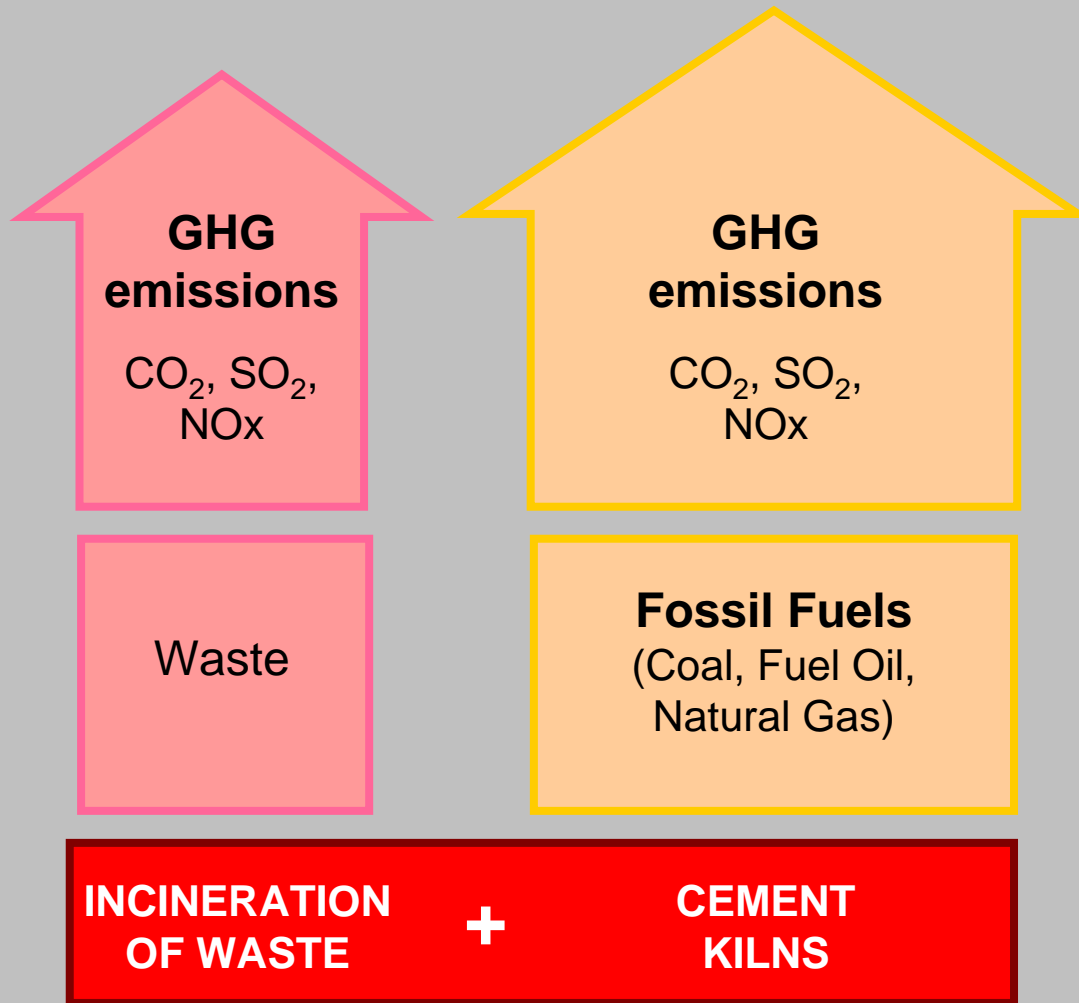
A cost-effective substitution of natural resources thereby improving the competitiveness of the industry

Society (PEOPLE):

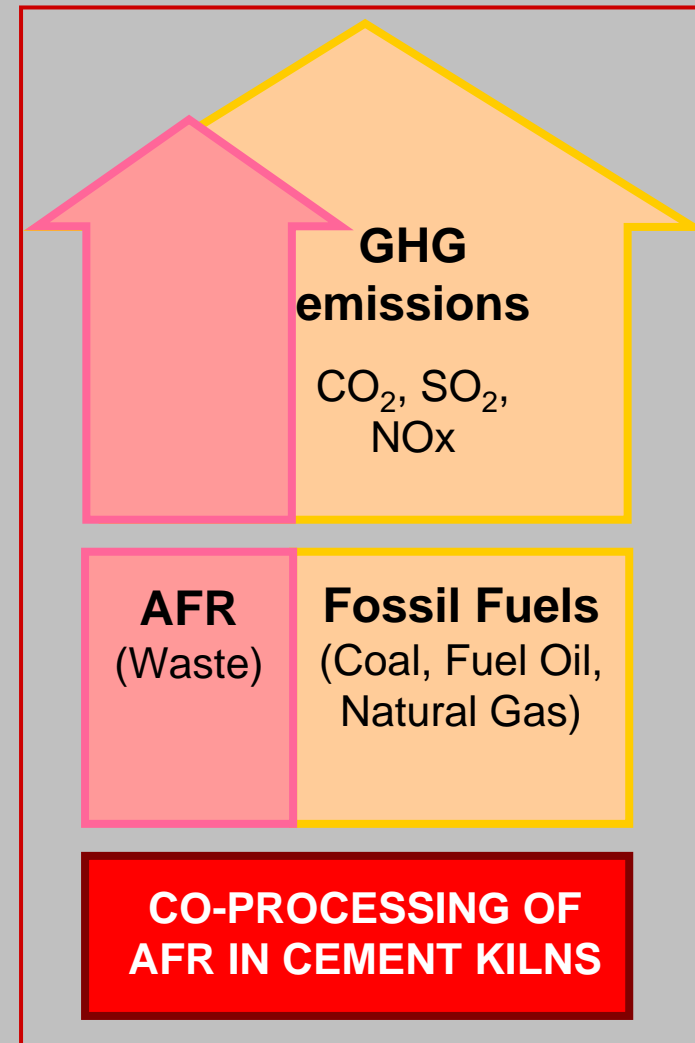
A long term and sound solution for the treatment of a number of wastes produced by our society

CO-PROCESSING AND REDUCTION OF GHG EMISSIONS

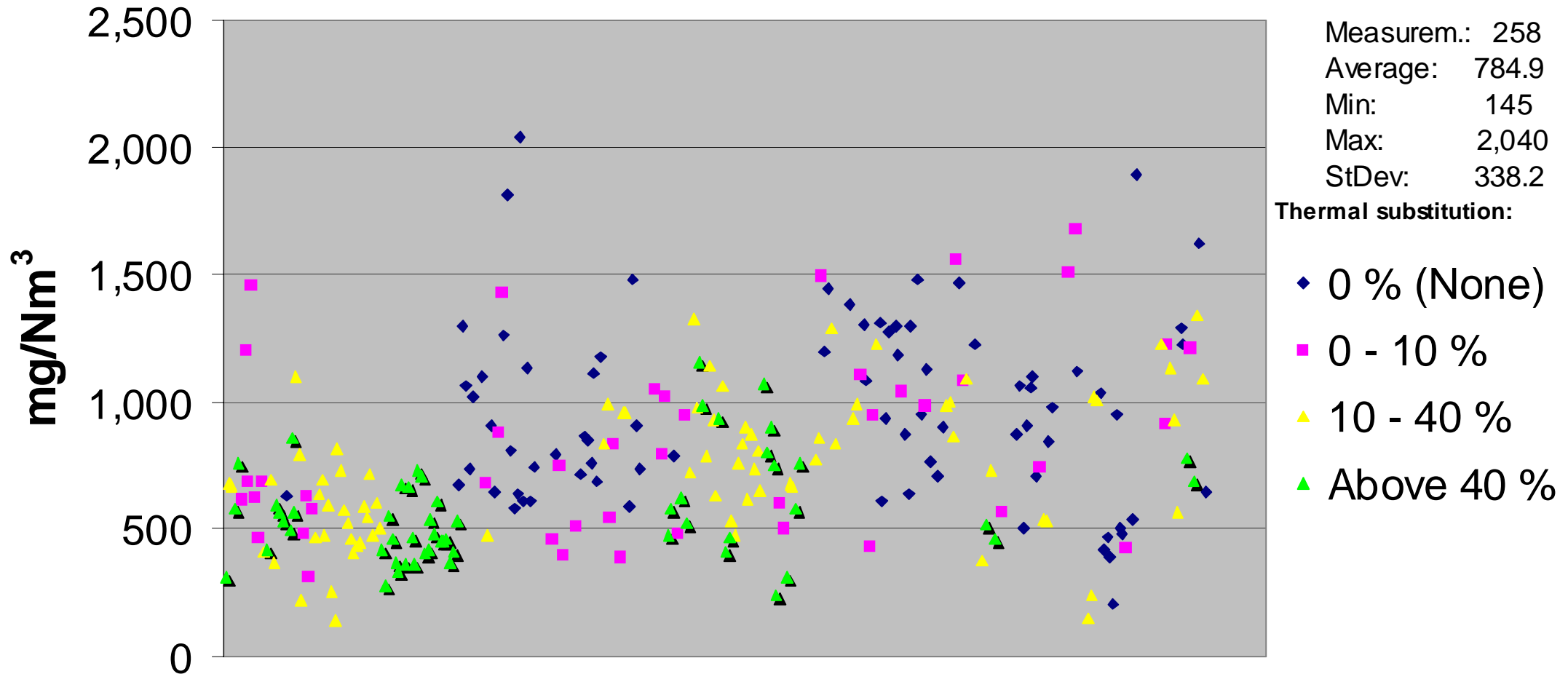
Conventional approach



Integrated approach



NOx EMISSIONS 2004 - CONTINUOUS



NOx emissions in 2004 categorised by thermals substitution rate. The red line indicates the limit in accordance with the W.I.D. Until the end of 2008, higher limits are allowed under specific conditions (Low input rate, etc).

REMAINING BARRIERS

At national level:

- No incentives for collection and sorting of waste
- No implementation of Waste Action Plans
- No action versus illegal landfilling
- No reduction of landfilling

EU Member States should take waste management seriously

NEW BARRIERS AT EU LEVEL

- EU Biomass Action Plan (Dec. 2006):
Biomass → electricity and transport
- EU target 20% of renewables by 2020 (8-9 March 2007)
use of biomass fundamentally redirected

ALTERNATIVE FUELS: OUR AMBITION

YEAR	SUBSTITUTION RATE	CO ₂ EMISSIONS AVOIDED
1990	3%	1.7 Mt
1998	13%	7.4 Mt
2000	About 12%	6.8 Mt
2004	17%	9.7 Mt
Our Ambition:		
2010 (No barriers)	27%	15.4 Mt

OUR AMBITION BUT ...

- New (revised) Framework Directive ???
- New definition of recovery ???
- New (revised) Incineration of Waste Directive ???
- New (revised) IPPC Directive ???
- Recognition of CO₂ indirect savings ???

TIMING IPPC – WID REVIEW

- Review of IPPC Directive included in 2007 CEC Legislative Work Programme
- Stakeholder Hearing 4 May 2007
- Internet consultation until 18 June 2007
- CEC proposal IPPC and WID
 - ♣ Proposal by Summer?
 - ♣ Interservice and impact assessment in Autumn
 - ♣ Adoption end of 2007



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