



Large Combustion Plants LCP and the Lignite-Fired Power Plant REK Bitola

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Overview: LCP in the EU

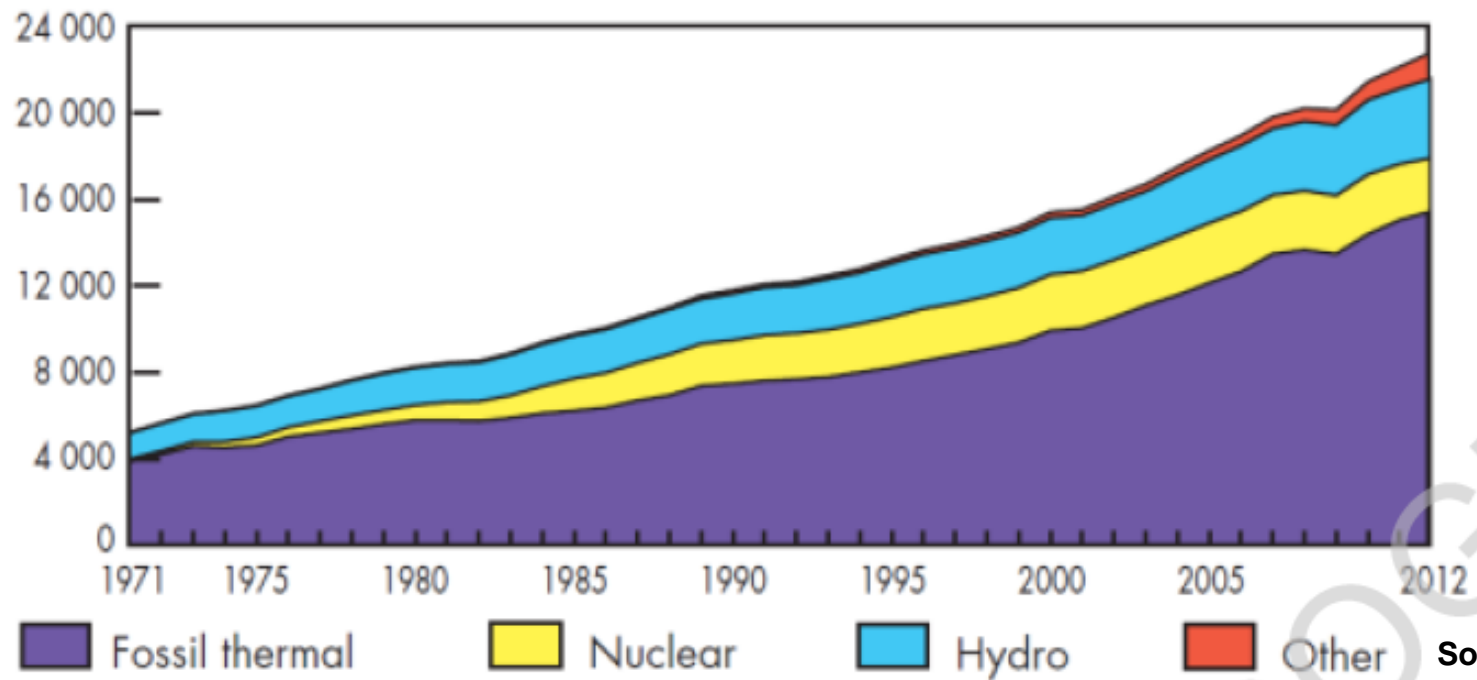


Source:
BREF Large Combustion
Plants. Final Draft, 06.2016.



Global Significance of Fossil Fuels

World electricity generation from 1971 to 2012 by fuel (TWh)



Source: [New 106, IEA, 2014]

Source:
BREF Large Combustion
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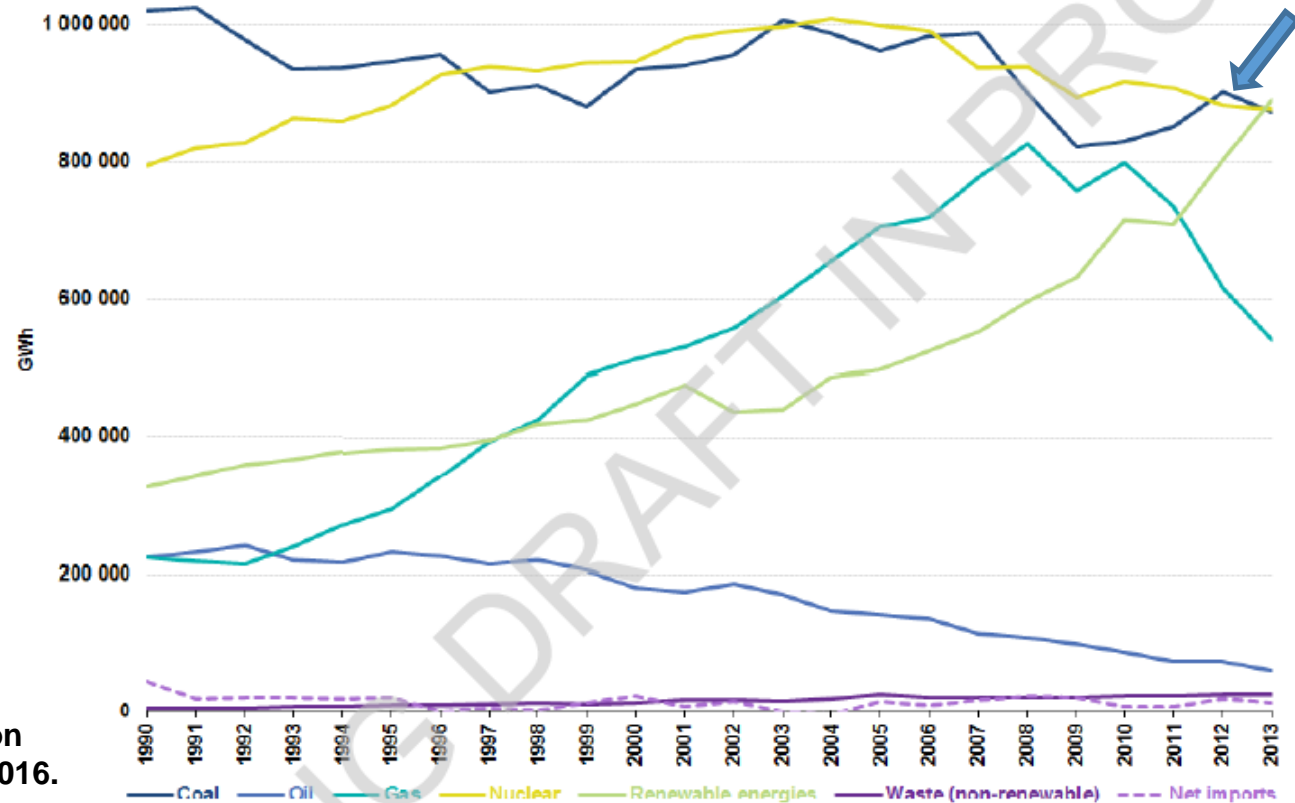


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Fossil Fuels in the EU

Gross electricity generation by fuel, GWh, EU-28, 1990-2013



Source:
BREF Large Combustion
Plants. Final Draft, 06.2016.

Source: [New 107, Eurostat 2016]

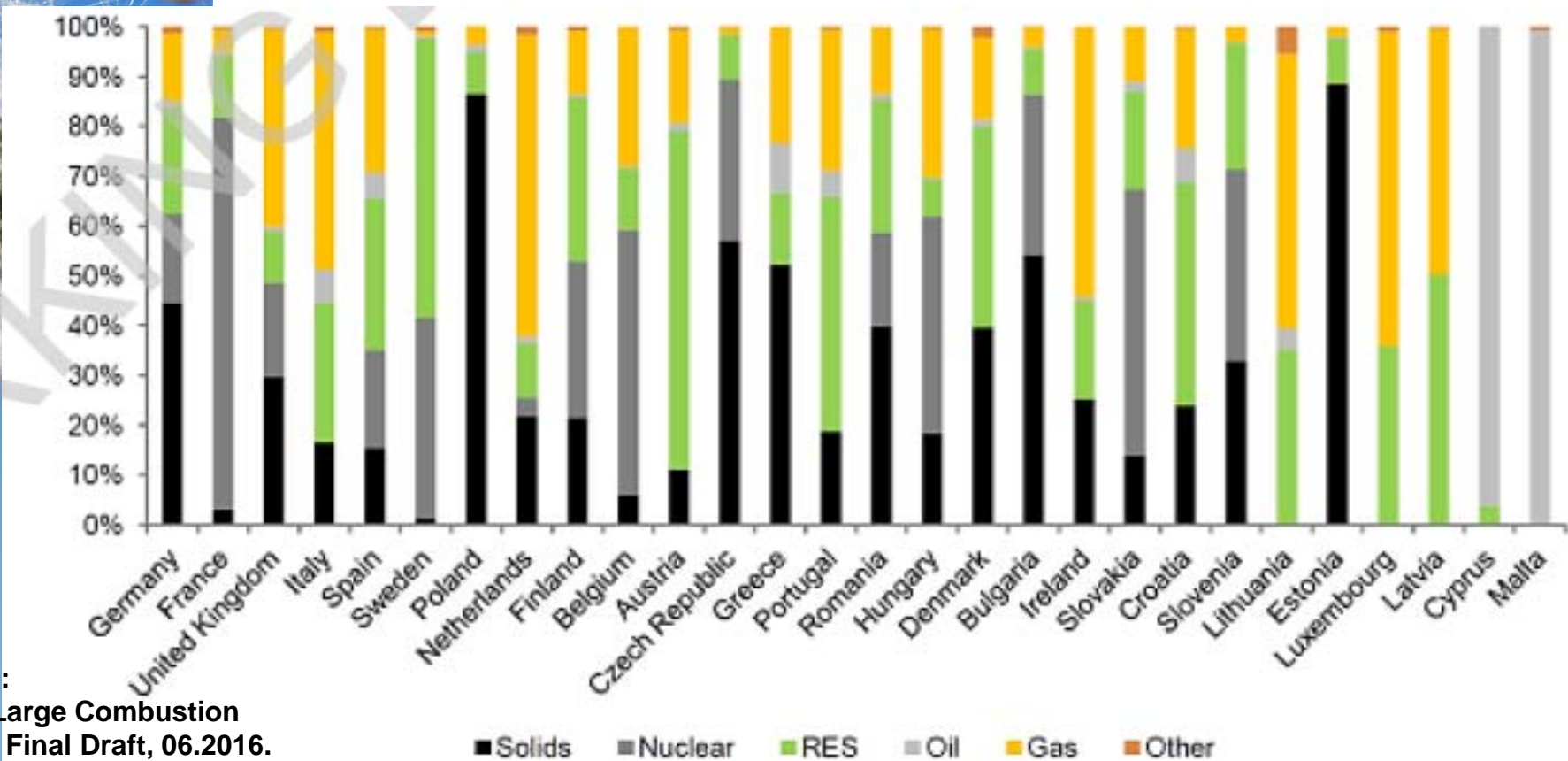
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Fossil Fuels in the EU

Fuel mix of electricity generated in 2011 in the EU-28



Source:
BREF Large Combustion
Plants. Final Draft, 06.2016.

Source: [New 109, Eurostat submitted by PL]

TRINING PROJECT IMPLIMENTATION
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Styrian Power Plants

Coal, oil and combined cycle power plants in Mellach and Neudorf/Werndorf



Source: H. Reissner / Andritz AG Graz. Green Week, 4-7 June, 2013, Brussels.

Coal/Lignite Power Plants in Austria

Plant	MW _{el}	Fuel	Completion	
Dürnrrohr 1	405	coal, natural gas	1986	Out of service
Dürnrrohr 2	370	coal, natural gas, MSW, biomass	1986	
Voitsberg	330	lignite	1983	Out of service 2012; demol.
Mellach	246	coal, sewage sludge	1986	
Riedersbach	176	coal	1986	Out of service
Zeltweg	118	lignite	1963	Out of service 2012; demol.
St. Andrä	110	lignite	1959	Out of service 2011; demol.
Timelkam 2	66	coal	1962	
Riedersbach 1	55	coal	1969	

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Emission Pathways of LCP to air, water and land

	PM	SO _x	NO _x	CO, CO ₂	Org. comp.	H ⁺ , OH ⁻ , Salts	HCl, HF	VOC	Met.	ClO	Hg, Cd	PAH	PCDD
Fuel storage and handling	A				W			A					
Water treatment	W								W		W		
Flue-gas	A	A	A	A	A		A	A	A		A	A	A
Flue-gas treatment	W				W				W L		W		
Site drainage	W				W								
Waste water treatment	W L				W	W			L		L		
Cooling water blowdown	W				W				W	W	W		
Cooling tower exhaust								A					

Source:
BREF Large Combustion Plants. Final Draft, 06.2016.

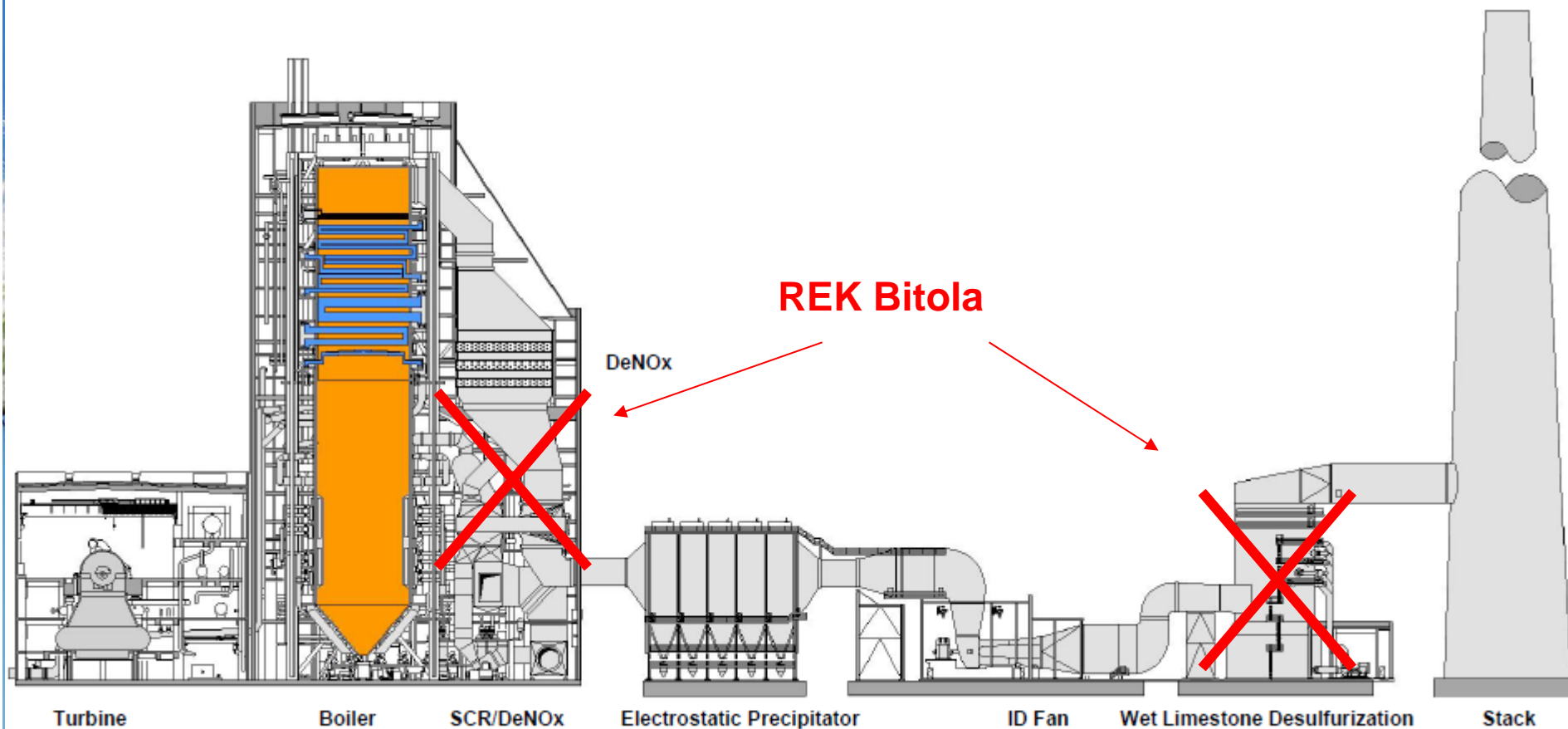
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Air Quality Control Technology



Source of installation image (without indications for REK Bitola):
H. Reissner / Andritz AG Graz. Green Week, 4-7 June, 2013, Brussels.

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EU – Regulations for LCP

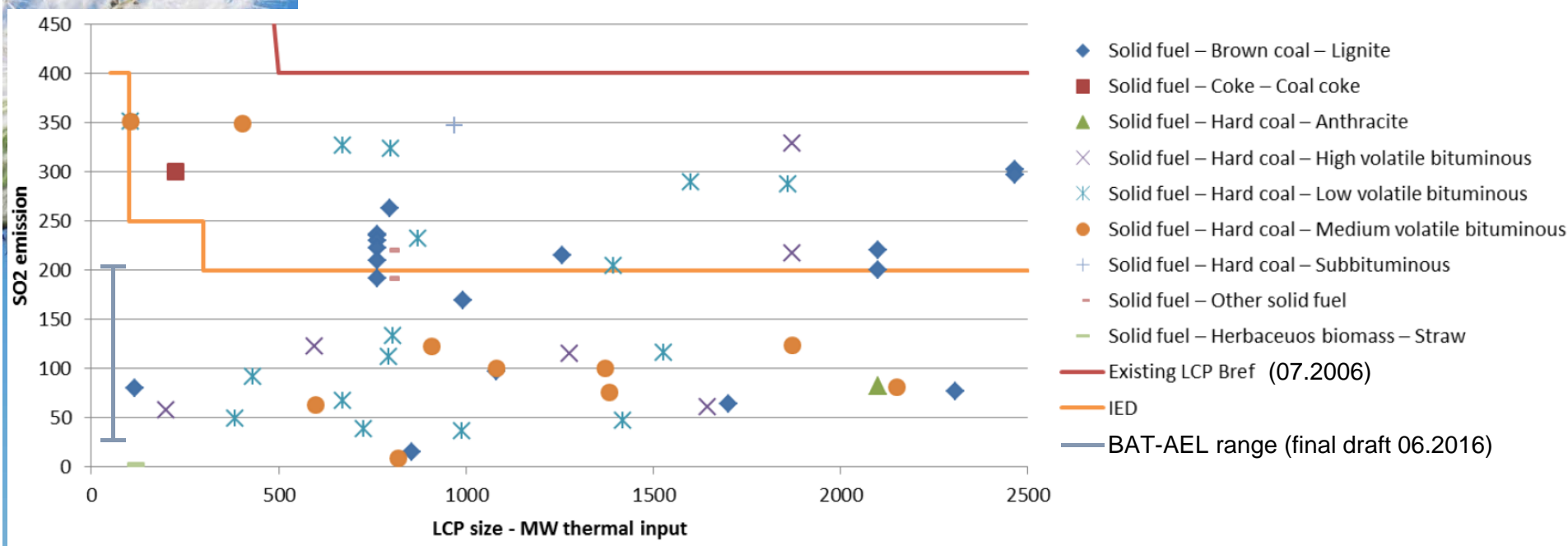
- Industrial Emissions Directive **IED** (2010/75/EU):
 - Emissions of SO₂, NO_x and dust
- Best Available Techniques (**BAT**): the most effective and advanced stage of operations considered technically and economically viable, have to be applied
- Emission limit values in the permits have to be based on BAT conclusions
- Current status of BAT conclusions for LCP:
 - final draft (June 2016)

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Example: SO_x Emissions – Operational Data

● REK Bitola: 1.610 – 2.311 mg/m³_n



Source of graph (without indication of BAT-AEL range): H. Reissner / Andritz AG Graz. Green Week, 4-7 June, 2013, Brussels.

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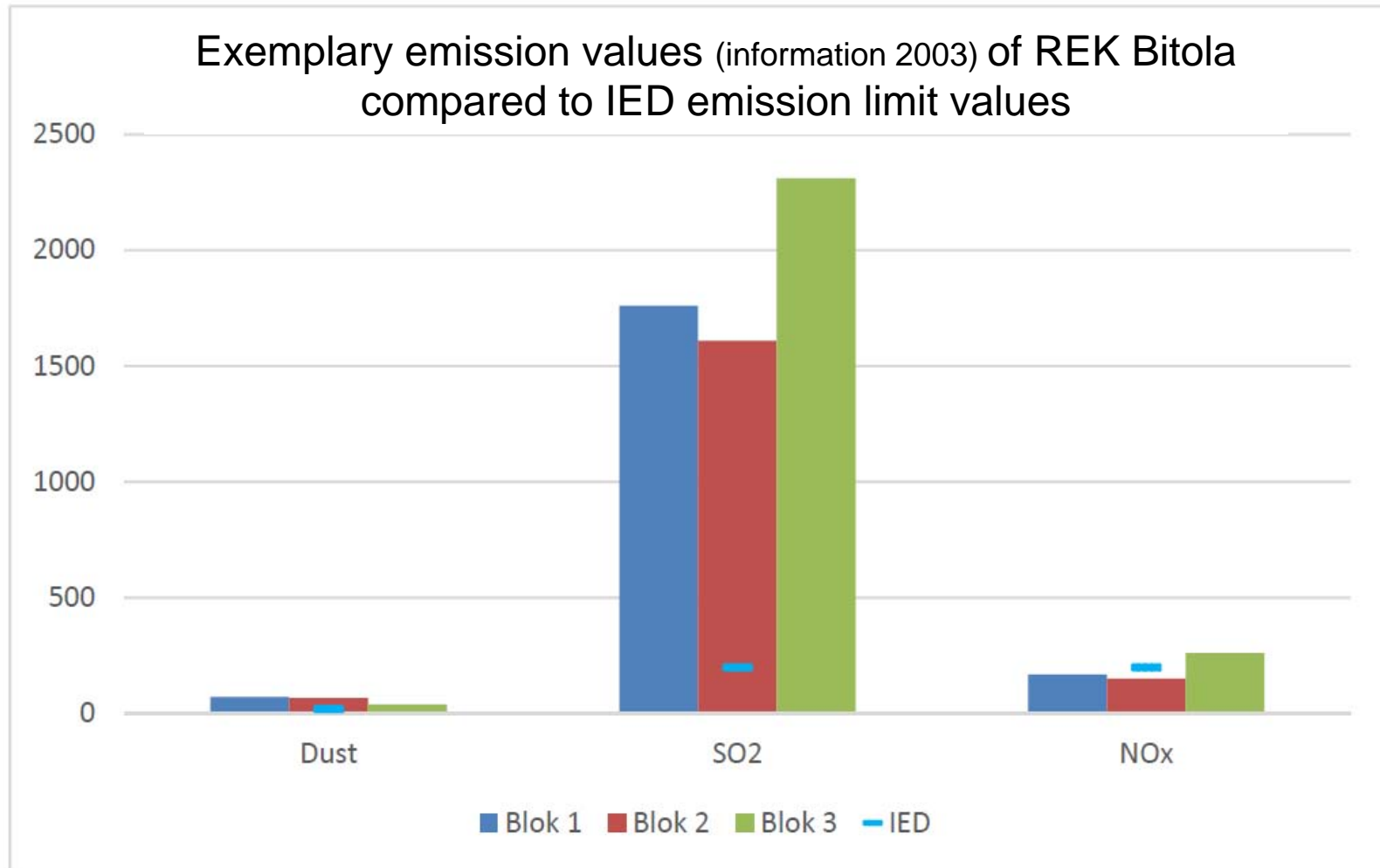
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Emissions of REK Bitola and IED-ELV



Exemplary emission values (information 2003) of REK Bitola compared to IED emission limit values



BAT Conclusions – Combustion of Coal / Lignite (final draft 06.2016)

- General environmental performance
- Energy efficiency
- NO_x, N₂O and CO emissions to air
- SO_x, HCl and HF emissions to air
- Dust and particulate-bound metal emissions to air
- Mercury emissions to air

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General BAT conclusions for LCP (final draft 06.2016)

- Environmental management system
- Monitoring
- General environmental and combustion performance
- Energy efficiency
- Water usage and emissions to water
- Waste management
- Noise emissions

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Questions?



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