

Appendix A

Table A1.

- Energy: Lignite ST, Advanced Technology

	Current	2010	2020	2030
1) Range of unit size and project size [MW]		1050	1050	1050
2) Nominal efficiency				
<i>i) For electricity generation only [%]</i>		45	50	50
<i>ii) For combined heat and power [%]</i>				
3) Efficiency at partial load				
4) Flexibility towards fuel, fuel resource availability, plant siting and infrastructures (e.g. cooling water needs, high voltage, grid gas pipes, etc.)				
5) Flexibility towards exploitation:				
<i>i) Cold start [minutes from 0% to 90% of nominal power]</i>				
<i>ii) Warm/lukewarm start [minutes from 0% to 90% of nominal power]</i>				
<i>iii) Uncontrollable variation in load [% from nominal power]</i>				
Total energetic score				

- Ecology and resource use:

1) Exhaust, direct for operation [kg/kWh] / indirect				
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for construction and dismantling [kg/kW]:				
i) CO_2 [kg/kWh _{electricity}] / [kg/kW]		0.883500 /	0.802495 /	0.802495 /
ii) SO_2 [kg/kWh _{electricity}]		0.001081 0.000644 /	0.000974 0.000579 /	0.000974 0.000579 /
iii) NO_x [kg/kWh _{electricity}]		0.000004 0.000667 /	0.000004 0.000603 /	0.000004 0.000603 /
iv) PM_{10} [kg/kWh _{electricity}]		0.000005 0.000097 /	0.000005 0.000093 /	0.000005 0.000093 /
v) $NMVOC$ [kg/kWh _{electricity}]		0.000004 0.000018 /	0.000003 0.000017 /	0.000003 0.000017 /
vi) <i>Methane</i> [kg/kWh _{electricity}]		0.000001 0.000016 /	0.000001 0.000015 /	0.000001 0.000015 /
vii) N_2O [kg/kWh _{electricity}]		0.000003 0.000028 /	0.000003 0.000025 /	0.000003 0.000025 /
viii) C_{14} [kg/kWh _{electricity}]		0.000000 0.000012 /	0.000000 0.000012 /	0.000000 0.000012 /
ix) <i>Heavy metals [most important ones, g/kWh_{electricity}]</i>		0.000011	0.000010	0.000010
2) Thermal exhaust [TJ/GWh _{electricity}]				
i) <i>Into air</i>		0.346421	0.283435	0.283435
ii) <i>Into water source</i>		1.5075720	1.2334680	1.2334680
3) Liquid waste, direct for operation [kg/kWh] / indirect for construction and dismantling [kg/kW]:				
i) <i>Total liquid waste [kg/kWh_{electricity}]</i>				
ii) <i>Total nitrogen into water source</i>		0.000000	0.000000	0.000000

		/	/	/
		0.000000	0.000000	0.000000
iii) Total phosphor into water source [kg/kWh _{electricity}]				
iv) Total chlorides into water source [kg/kWh _{electricity}]		0.000046	0.000046	0.000046
v) Total sulfates into water source [kg/kWh _{electricity}]		/	/	/
		0.000009	0.000009	0.000009
		0.007326	0.007325	0.007325
		/	/	/
		0.000006	0.000005	0.000005
vi) Others (KMnO ₄ , iron, organic materials, solid materials)[<i>Separately</i>]		Iron:	Iron:	Iron:
		0.001449	0.001449	0.001449
		/	/	/
		0.000001	0.000001	0.000001
4) Solid waste [tons/MWh _{electricity}]				
i) Flue dust				
ii) Slurry		0.0582249	0.0524014	0.0524014
iii) Hazardous waste		Waste Oil:	Waste Oil:	Waste Oil:
		0.0000149	0.0000136	0.0000136
iv) Radioactive waste				
v) Other solid waste				
5) Safety and health impacts				
i) Population affected by worst perceived accident during operation [nr of persons]				
ii) Number of deaths over the fuel cycle [persons/MWh _{electricity}]				
iii) Other effects				
6) Visual impact and noise				
7) Footprint and use of resources				
i) Primary material moved for construction [kg/kW _p of nominal power]				
ii) Secondary material moved for construction				
	Total:	Total:	Total:	Total:

<p><i>[kg/kW_p of nominal power</i></p> <p>iii) <i>Main materials uses for construction (five)</i> <i>[kg/kW_p of nominal power]</i></p> <p>iv) <i>Primarily material moved for usage e.g. fuel</i> <i>[tons/ MWh_{electricity}]</i></p> <p>v) <i>Secondary material moved for usage e.g. fuel</i> <i>[tons/ MWh_{electricity}]</i></p> <p>vi) <i>Critical materials in construction and usage</i> <i>(materials that may become a limiting factor</i> <i>for the technology) [kg/kW_p of nominal</i> <i>power]</i></p> <p>Total ecological score</p>		<p>Iron: 131086 Aluminum: 2845 Concrete: 481917 Copper: 993</p>	<p>Iron: 118095 Aluminum: 2608 Concrete: 481917 Copper: 993</p>	<p>Iron: 118095 Aluminum: 2608 Concrete: 481917 Copper: 993</p>
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- Economy (without subsidies, price level for 2003):

<p>1) Investment cost [euro/MW]</p> <p>2) Availability [hours per year]</p> <p>3) Operational time [hours of nominal power/year]</p> <p>4) Reliability [%]</p> <p>5) Technical life span [years]</p> <p>6) Construction time [years]</p> <p>7) Fuel cost [euro/MJ]</p> <p>8) Operation and Maintenance (O&M) cost [euro/MWh_{electricity}]</p> <p>9) Waste handling and dismantling [euro/ MWh_{electricity}]</p> <p>Total economic score</p>		<p>920.3</p> <p>7500</p> <p>35</p> <p>4</p> <p>4.5</p> <p>0.1</p>	<p>930.6</p> <p>7500</p> <p>35</p> <p>4</p> <p>4.5</p> <p>0.1</p>	<p>920.3</p> <p>7500</p> <p>35</p> <p>4</p> <p>4.5</p> <p>0.1</p>
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