

Appendix A

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Table A1.

▪ Energy:

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	Large scale hydro including Dam	Small scale hydro
1) Range of unit size and project size [MW]	10- 800/unit	<10/unit
2) Nominal efficiency		
<i>i) For electricity generation only [%]</i>	90	90
<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.)	N.A.	N.A.
5) Flexibility towards exploitation:		
<i>i) Cold start [minutes from 0% to 90% of nominal power]</i>	5- 10 Minutes	2- 3 Minutes
<i>ii) Warm/lukewarm start [minutes from 0% to 90% of nominal power]</i>	< 1 Minute	< 1 Minute
<i>iii) Uncontrollable variation in load [%from nominal power]</i>	<5%	<5%
Total energetic score		

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▪ Ecology and resource use:

<p>1) Exhaust [average in lifetime, including construction & transport]:</p> <p>i) CO_2 [kg/kWh_{electricity}]</p> <p>ii) SO_2 [kg/kWh_{electricity}]</p> <p>iii) NO_x [kg/kWh_{electricity}]</p> <p>iv) PM_{10} [kg/kWh_{electricity}]</p> <p>v) $NMVOG$ [kg/kWh_{electricity}]</p> <p>vi) <i>Methane</i> [kg/kWh_{electricity}]</p> <p>vii) N_2O [kg/kWh_{electricity}]</p> <p>viii) C_{14} [kg/kWh_{electricity}]</p> <p>ix) <i>Heavy metals [most important ones, g/kWh_{electricity}]</i></p>	<p>576- 4980 (x10⁻⁶)</p> <p>1.08- 1.72 (x10⁻⁶)</p> <p>5.1- 8.1 (x10⁻⁶)</p> <p>-</p> <p>-</p> <p>5.58 (x10⁻⁶)</p> <p>-</p> <p>-</p> <p>-</p>	
<p>2) Thermal exhaust [TJ/GWh_{electricity}]</p> <p>i) <i>Into air</i></p> <p>ii) <i>Into water source</i></p>	<p>0</p> <p>0</p>	
<p>3) Liquid waste</p> <p>i) <i>Total liquid waste [kg/kWh_{electricity}]</i></p> <p>ii) <i>Total nitrogen into water source [kg/kWh_{electricity}]</i></p> <p>iii) <i>Total phosphor into water source [kg/kWh_{electricity}]</i></p> <p>iv) <i>Total chlorides into water source [kg/kWh_{electricity}]</i></p> <p>v) <i>Total sulfates into water source [kg/kWh_{electricity}]</i></p> <p>vi) <i>Others (Oil,)</i></p>	<p>-</p> <p>1.3- 66 (x10⁻⁹)</p> <p>0.24 (x10⁻⁹)</p> <p>-</p> <p>-</p> <p>52- 832 (x10⁻⁹)</p>	
<p>4) Solid waste [tons/MWh_{electricity}]</p> <p>i) <i>Flue dust</i></p>	<p>-</p>	

ii) Slurry	-	
iii) Hazardous waste	-	
iv) Radioactive waste	-	
v) Other solid waste	-	
5) Safety and health impacts	Total:	Total:
i) Population affected by worst perceived accident during operation [nr of persons]		
ii) Number of deaths over the fuel cycle [persons/MWh _{electricity}]	<10 ⁻⁶	
iii) Other effects		
6) Visual impact and noise	Major impact, noise	Local visual impact, low 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 [kg/kW _p of nominal power]		
iii) Main materials uses for construction (five) [kg/kW _p of nominal power]	1.concrete/earth 2. 3. 4. 5.	1. concrete 2. 3. 4. 5.
iv) Primarily material moved for usage e.g. fuel [tons/ MWh _{electricity}]		
v) Secondary material moved for usage e.g. fuel [tons/ MWh _{electricity}]		
vi) Critical materials in construction and usage (materials that may become a limiting factor for the technology) [kg/kW _p of nominal		

<i>power]</i> Total ecological score		
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- Economy (without subsidies, price level for 2003):

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1) Investment cost [euro/MW]	1.4- 1.9 (x10 ⁶)	
2) Availability [hours per year]	7000- 8000	
3) Operational time [hours of nominal power/year]	7000	
4) Reliability [%]		
5) Technical life span [years]	50+	
6) Construction time [years]	5- 10	
7) Fuel cost [euro/MJ]	0	
8) Operation and Maintenance (O&M) cost [euro/MWh _{electricity}]	260- 510	
9) Waste handling and dismantling [euro/MWh _{electricity}]		
Total economic score		