

Appendix A

Table A1.

- Energy:

<p>1) Range of unit size and project size [MW] 2) Nominal efficiency <i>i) For electricity generation only [%]</i> <i>ii) For combined heat and power [%]</i></p> <p>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></p> <p>Total energetic score</p>	<p>Technology 900-1450</p> <p>34-36% (EPR) Not yet used to produce electricity and/ heat.. However it is possible to do it. Either at high temperature or to extract heat from the low temperature cooling fluid using heat pumps</p> <p>Good availability of fuel. Needs to be close to a river or to the sea</p> <p>Of the order of 3%/h</p> <p>Of the order of 5%/mn. Modulation +or-70MW, change 200 MW/mn <1%</p>
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- Ecology and resource use:

<p>1) Exhaust [average in lifetime, including construction & transport]:</p> <ul style="list-style-type: none"> i) CO_2 [kg/kWh_{electricity}] ii) SO_2 [kg/kWh_{electricity}] iii) NO_x [kg/kWh_{electricity}] iv) PM_{10} [kg/kWh_{electricity}] v) $NMVOC$ [kg/kWh_{electricity}] vi) <i>Methane</i> [kg/kWh_{electricity}] vii) N_2O [kg/kWh_{electricity}] viii) C_{14} [kg/kWh_{electricity}] ix) <i>Heavy metals [most important ones, g/kWh_{electricity}]</i> <p>2) Thermal exhaust [TJ/GWh_{electricity}]</p> <ul style="list-style-type: none"> i) <i>Into air</i> ii) <i>Into water source</i> <p>3) Liquid waste</p> <ul style="list-style-type: none"> i) <i>Total liquid waste</i> [kg/kWh_{electricity}] ii) <i>Total nitrogen into water source</i> [kg/kWh_{electricity}] iii) <i>Total phosphor into water source</i> [kg/kWh_{electricity}] iv) <i>Total chlorides into water source</i> [kg/kWh_{electricity}] v) <i>Total sulfates into water source</i> [kg/kWh_{electricity}] vi) <i>Others (KMnO₄, iron, organic materials, solid materials)[Separately]</i> <p>4) Solid waste [tons/MWh_{electricity}]</p> <ul style="list-style-type: none"> i) <i>Flue dust</i> ii) <i>Slurry</i> iii) <i>Hazardous waste</i> iv) <i>Radioactive waste</i> v) <i>Other solid waste</i> <p>5) Safety and health impacts</p>	<p>0.3 g / kWh</p> <p>0.001 g / kWh</p> <p>0.001 g / kWh</p> <p>2 e-5 g / kWh</p> <p>0.0003 g / kWh</p> <p>0.0006 g</p> <p>9 e-6 g</p> <p>0.02 kBq / kWh</p> <p>2GWh of heat (7,2 TJ) for 1 GWh of electricity</p> <p>6 e-6 g / kWh</p> <p>9 e-9 g / kWh</p> <p>0.008 g / kWh</p> <p>0.1 g/kWh</p> <p>0</p> <p>10g/MWh (<1g/MWh of medium and long lifetime and high radioactivity)</p> <p>Total:</p>
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<p>i) <i>Population affected by worst perceived accident during operation [nr of persons]</i></p> <p>ii) <i>Number of deaths over the fuel cycle [persons/MWh_{electricity}]</i></p> <p>iii) <i>Other effects</i></p> <p>6) Visual impact and noise</p> <p>7) Footprint and use of resources</p> <p>i) <i>Primary material moved for construction [kg/kW_p of nominal power]</i></p> <p>ii) <i>Secondary material moved for construction [kg/kW_p of nominal power]</i></p> <p>iii) <i>Main materials uses for construction (five) [kg/kW_p of nominal power]</i></p> <p>iv) <i>Primarily material moved for usage e.g. fuel [tons/MWh_{electricity}]</i></p> <p>v) <i>Secondary material moved for usage e.g. fuel [tons/MWh_{electricity}]</i></p> <p>vi) <i>Critical materials in construction and usage (materials that may become a limiting factor for the technology) [kg/kW_p of nominal power]</i></p> <p>Total ecological score</p>	<p>No dead people are expected in the EPR technology (confinement of the melted core) nor in the European technologies. No evacuation of the population needed</p> <p>0</p> <p>1. concrete <1e-6</p> <p>2. steel <1e-8</p> <p>3.</p> <p>4.</p> <p>5.</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>1300-1800€/kW ; 17,1€/MWh</p> <p>7900 hours/year</p>
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3) Operational time [hours of nominal power/year]	7650 hours
4) Reliability [%]	
5) Technical life span [years]	60 years
6) Construction time [years]	5 years
7) Fuel cost [euro/MJ]	4,2€/MWh=1.2e-3€/MJ
8) Operation and Maintenance (O&M) cost [euro/MWh _{electricity}]	5,8€/MWh
9) Waste handling and dismantling [euro/ MWh _{electricity}]	4.6€/MWh
Total economic score	30,9€/MWh