Appendix A

Table A1.

- Energy:

	CCGT
1) Range of unit size and project size [MW]	400 to 500 MW
2) Nominal efficiency	
i) For electricity generation only [%]	55 to 60%
ii) For combined heat and power [%]	
3) Efficiency at partial load	See figure 1
4) Flexibility towards fuel, fuel resource availability, plant siting and infrastructures (e.g. cooling water needs, high voltage, grid gas pipes, etc.)	Use of 5 to 10% biomass possible
5) Flexibility towards exploitation:	
i) Cold start [minutes from 0% to 90% of nominal power]	10 to 16 hrs: CCGT 15 to 30 min: GT
ii) Warm/lukewarm start [minutes from 0% to 90% of nominal power]	1 to 2 hrs
iii) Uncontrollable variation in load [% from nominal power]	5% of nominal capacity per minute
Total energetic score	

- Ecology and resource use:

1) Exhaust [average in lifetime, including construction & transport]:	

i) CO_2 [kg/kWh$_{electricity}$]	0.350 to 0.400
ii) SO_2 [kg/kWh$_{electricity}$]	Negligible
iii) NO_x [kg/kWh$_{electricity}$]	9 to 25 ppmV; ~ 0.189 g/kWh
iv) PM_{10} [kg/kWh$_{electricity}$]	0.25 g/GJ
v) NMVOC [kg/kWh$_{electricity}$]	Negligible
vi) Methane [kg/kWh$_{electricity}$]	Negligible
vii) N_2O [kg/kWh$_{electricity}$]	Negligible
viii) C_{14} [kg/kWh$_{electricity}$]	Negligible
ix) Heavy metals [most important ones, g/kWh$_{electricity}$]	Negligible
2) Thermal exhaust [TJ/GWh$_{electricity}$]	
i) Into air	0.468 to 0.648
ii) Into water source	1.980 to 2.520
3) Liquid waste	Negligible
i) Total liquid waste [kg/kWh$_{electricity}$]	
ii) Total nitrogen into water source [kg/kWh$_{electricity}$]	
iii) Total phosphor into water source [kg/kWh$_{electricity}$]	
iv) Total chlorides into water source [kg/kWh$_{electricity}$]	
v) Total sulfates into water source [kg/kWh$_{electricity}$]	
vi) Others ($KMnO_4$, iron, organic materials, solid materials)[Separately]	
4) Solid waste [tons/MWh$_{electricity}$]	Negligible
i) Flue dust	
ii) Slurry	
iii) Hazardous waste	
iv) Radioactive waste	
v) Other solid waste	Total:
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) Footprint modern CCGT-plant *ii) Primary material moved for construction [kg/kW$_p$ of nominal power* *iii) Secondary material moved for construction [kg/kW$_p$ of nominal power* *iv) Main materials uses for construction (five) [kg/kW$_p$ of nominal power]* *v) Primarily material moved for usage e.g. fuel [tons/ MWh$_{electricity}$]* *vi) Secondary material moved for usage e.g. fuel [tons/ MWh$_{electricity}$]* *vii) Critical materials in construction and usage (materials that may become a limiting factor for the technology) [kg/kW$_p$ of nominal power]* **Total ecological score**	 CCGT-equipment: ± 4 hectare Indirect cooling (natural or forced): tower or aero condenser: ± 0,5 hectare 1. Concrete: 292,21 2. Copper: 0,36 3. Steel: 27,24 4. 5.

- Economy (without subsidies, price level for 2003):

1) Investment cost [euro/MW] 2) Availability [hours per year] 3) Operational time [hours of nominal power/year] 4) Reliability [%]	400 to 800 €/kWe Approx. 90%

5) Technical life span [years] 6) Construction time [years] 7) Fuel cost [euro/MJ] 8) Operation and Maintenance (O&M) cost [euro/$MWh_{electricity}$] 9) Waste handling and dismantling [euro/ $MWh_{electricity}$] **Total economic score**	20 to 30 yrs 2 to 3 yrs