

BIOMASS

1999-2003

MARKET/ APPLICATION/ TECHNOLOGY SEGMENTS	ESTIMATED INSTALLED CAPACITY	TYPE OF TERRITORY	ESTIMATED INSTALLED CAPACITY	AVERAGE UNIT COST EURO	TOTAL INVESTMENT BILLION EURO	ACTORS
1. Combined heat and power * small scale <1MW * medium scale 1-20 MW * large scale >20 MW	10,000 MWth	* Isolated rural areas	2,000 MWth	1,000	2	<ul style="list-style-type: none"> • Farmers associations • Co-operatives • Forest based industries • Local authorities
		* Decentralised agricultural areas	5,000 MWth	500	2.5	
		* Highly organised agricultural areas	3,000 MWth	350	1.05	
1. 1,000,000 dwellings heated by biomass * individual domestic heating (logwood, woodchip, pellet systems) * central heating units * district heating plants	10,000 MWth	* Private homes, farms	6.000 MWth	400	2.4	<ul style="list-style-type: none"> • Users' associations • Building promoters • Architects' associations
		* Large buildings, blocks	2.000 MWth	300	0.6	
		* Cities, small urban communities	2.000 MWth	700	1.4	
1. 1,000 MW of biogas installations * large centralised plants * farm scale plants	1,000 MW	* Municipalities	800 MW	1,000	0.8	<ul style="list-style-type: none"> • Municipal utilities • Local authorities • Farmers • Co-operatives
		* Farms	200 MW	2,000	0.4	
1. 5 Million Tonnes of Liquid biofuels	5 Mio Tonnes	Cities		250	1.25	<ul style="list-style-type: none"> • Oil and car industries • City transport authorities • City planning bodies
TOTAL					12.4	

PV

1,000,000 kW_p

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1. 450,000 kW_p roof top systems (150,000 systems with an average size of 3 kW _p): Individual houses, Apartment Buildings, Schools, Tourism, Sport Facilities	450 MW_p	45	Northern Europe	350 MW _p	35	4,000/kW _p	1,4	<ul style="list-style-type: none"> • Users' associations • Architects' associations • Local authorities • Building promoters • Tourist industry • Athletic associations • Public procurement.
			Southern Europe	100 MW _p	10	4,000/kW _p	0,4	
2. 150,000 kW_p building facades (5,000 systems with an average size of 30 kW _p): Commercial buildings, Institutional public buildings, Tourism, Sport, recreational Facilities	150 MW_p	15	Northern Europe	100 MW _p	10	5,000/kW _p	0,5	<ul style="list-style-type: none"> • National, regional, local authorities • Building promoters • tourist industry • Athletic associations
			Southern Europe	50 MW _p	5	5,000/kW _p	0,25	
3. Stand alone rural development	50 MW_p	5	* Isolated homes (mainly Mediterranean)	20 MW _p	2	6,000/kW _p	0,12	<ul style="list-style-type: none"> • Users' associations • Local authorities • Island utilities
			* Island electrification (mainly Mediterranean)	20 MW _p	2		0,12	
			* Summer houses (mainly Scandinavian)	10 MW _p	1		0,06	
4. Developing world Rural household electrification Water pumping Education Health Communication	350 MW_p 150 MW _p 80 MW _p 80 MW _p 20 MW _p 20 MW _p	35	Developing countries	350 MW _p	35	7,000/kW _p	2,45	<ul style="list-style-type: none"> • International aid organisations • Financial institutions (World bank, UNDP, GEF, ADB, NGO's)
TOTAL	1,000 MW_p	100		1,000 MW_p	100		5,3	

Solar Collectors

15 Mio m²

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1. Domestic hot water production (2.4-10 m ²)	5 Mm ²	33.3	EU countries and regions whose market is not developed	5 Mm ²	33.3	400/m ²	2.0	Users associations
2. Large collective solar systems Hospitals, hotels, collective housing, sport facilities (>100 m ²)	3 Mm ²	20	All EU countries	3 Mm ²	20	250/m ²	0.75	Professional associations
3. Space heating (20-50 m ³)	3 Mm ²	20	Northern Europe Southern Europe	2.4 Mm ² 0.6 Mm ²	16 4	250/m ²	0.75	
4. District heating (>500 m ²)	2 Mm ²	13.3	Northern Europe	2 Mm ²	13.3	200/m ²	0.4	
5. Air conditioning and industrial process heating	2 Mm ²	13.3	Southern Europe	2 Mm ²	13.3	400/m ²	0.8	
TOTAL	15 Mm²	100		15 Mm²	100		4.7	

Wind Energy

10.000 MW

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1. Privately owned wind turbines (<2 MW)	450 MW	4.5	islands isolated areas low wind sites	150 MW 150 MW 150 MW	1.5 1.5 1.5	1,000/KW 1,000/KW 800/KW	0.15 1.15 0.12	<ul style="list-style-type: none"> • Farmers • Small Co-operatives • Local authorities
2. Small commercial wind farms (<5MW)	1,000 MW	10	islands isolated areas low wind site hostile sites	300 MW 300 MW 200 MW 200 MW	3 3 2 2	1,000/KW 1,000/KW 800/KW 1,000/KW	0.3 0.3 0.16 0.2	<ul style="list-style-type: none"> • Cooperatives • Industrial factories • Investment groups
3. Large commercial wind farms (5–100 MW)	4,500 MW	45	offshore hostile sites far from grid low wind sites	1,000 MW 1,000 MW 1,500 MW 1,000 MW	10 10 15 10	1,250/KW 1,000/KW 1,000/KW 800/KW	1.25 1 1.5 0.8	<ul style="list-style-type: none"> • Independent power producers
4. Utility owned wind farms (5–100 MW)	3,000 MW	30	offshore hostile sites low wind sites	1,500 MW 500 MW 500 MW	15 5 5	1,250/KW 1,000/KW 800/KW	1.875 0.5 0.4	<ul style="list-style-type: none"> • Electricity utilities
5. Niche markets (stand alone, wind–diesel, wind–desalination, telecommunication, ice production, hybrids)	1,000 MW	10	islands isolated areas	600 MW 400 MW	6 4	1,300/KW 1,300/KW	0.78 0.52	<ul style="list-style-type: none"> • Local and municipal utilities • Telecommunication companies • WT manufacturers
6. Development and testing of new wind turbines (multi–MW, small, lightweight, WT adopted for hostile and low wind sites)	50 MW	0.5	Test sites	50 MW	0.5	2,000/KW	0.1	<ul style="list-style-type: none"> • WT manufacturers
TOTAL	10,000 MW	100		10,000 MW	100		10.1	