

2003 RES-E EU FRAMEWORKS & PRICES (€/MWh)¹
Second Edition 2003 (July)

Country		SmallHydro	Wind	Biomass	Solar	Others
Austria	Old plants ²	56.8 €/MWh (for the first GWh) ³ 43.6 €/MWh (for the following four GWh) 36.3 €/MWh (for the following ten GWh) 32.8 €/MWh (for the following ten GWh) 31.5 €/MWh (for all the additional production)	From 73.5 €/MWh to 109 €/MWh (depending on the region and the investment costs)	From 47.7 €/MWh to 174.5 €/MWh (depending on power and region) ⁴	From 358 €/MWh to 726 €/MWh (depending on the region)	

¹ Report compiled by the President's Secretariat (mbustos@appa.es). Main sources: Italy (APER and GRTN), Luxembourg (Administration de l'Environnement – Lux Gov.), UK (Natsource), Belgium (VREG, CWAPE, BPI, STEM and UCL), Portugal (APREN), Austria (IGW and ÖVFK), Finland (Jarmo Vehmas-FFRC), Germany (BEE), France (EAF, FEE and ADEME), Greece (Greek RES Producers Assoc.), Spain (APPA and OMEL), Denmark (EWEA, Eurosolar, Nordpool and Danish Biogas Ass.), Sweden (SERO, Stem, Nordpool and Powernews), The Netherlands (ECN and APX) and Ireland (Department of Natural Resources – Irish Gov.). Notice that in those countries in which the renewables remuneration is not 100 % fixed but linked to the wholesale electricity market RES prices are given as average in 2003

² Regarded as plants which got all planning permissions before January 1st 2003, what includes all currently operating plants. They are entitled to receive such guaranteed feed-in tariffs for the first 10 years of plant operation except for the smallhydro plants which tariffs are fixed only up to 31st December 2005.

³ Compensations for existing small hydro plants are limited to 80 M€ per year. If they exceed such an amount within one single year tariff will be reduced in consequence.

⁴ From 82.8 €/MWh to 174.5 €/MWh (<1 MW); From 82,8 €/MWh to 159.8 €/MWh (<3 MW); Fom 63.6 €/MWh to 159.8 €/MWh (<10 MW) and From 47.7 €/MWh to 159. 8 €/MWh (>10 MW) (depending on the regions).

EREF

European Renewable Energies Federation

Austria	New plants ⁵	<p><u>Rebuilt plants with a production increase per year > 15%</u> 59.6 €/MWh (for the first GWh) 45.8 €/MWh (for the following four GWh) 38.1 €/MWh (for the following ten GWh) 34.4 €/MWh (for the following ten GWh) 33.1 €/MWh (for all the additional production)</p>	78 €/MWh	<p><u>Solid Biomass</u> 160 €/MWh (< 2 MW) 150 €/MWh (>2 <5 MW) 130 €/MWh (>5 <10 MW) 102 €/MWh (> 10 MW)</p> <p><u>Liquid Biomass</u> 130 €/MWh (< 200 kW) 100 €/MWh (> 200 kW)</p>	600 €/kWh (< 20 kWp) 470 €/kWh (> 20 kWp)	<u>Geothermal</u> 70 €/kWh
		<p><u>New Plants or rebuilt plants with a production increase per year > 50%</u> 62.5 €/MWh (for the first GWh) 50.1 €/MWh (for the following 4 GWh) 41.7 €/MWh (for the following 10 GWh) 39.4 €/MWh (for the following 10 GWh) 37.8 €/MWh (for all the additional production)</p>		<p><u>Biogas</u> 165 €/MWh (< 100 kW) 145 €/MWh (>100 < 500 kW) 125 €/MWh (>500 kW < 1 MW) 103 €/MWh (> 1 MW)</p> <p><u>Landfill gas</u> 60 €/MWh (< 1 MW) 30 €/MWh (> 1 MW)</p>		

⁵ Plants which get all planning permissions between January 1st 2003 and December 31st 2004 and start generating electricity by the end of 2006 are entitled to receive such feed-in guaranteed tariffs for the first 13 years of plant operation. Solar PV installations are entitled to this tariff scheme only up to 15 MW. This ceiling was actually reached in February 2003.

EREF

European Renewable Energies Federation

Belg. ⁶	Wallonia ⁷	<p>123 €/MWh = 33 €/MWh (market price) + 90 €/MWh (green certificate)⁸</p>	<p>Onshore 123 €/MWh = 33 €/MWh (market price) + 90 €/MWh (green certificate) Offshore 123 €/MWh = 33 €/MWh (market price) + 90 €/MWh (green certificate)</p>	<p>123 €/MWh = 33 €/MWh (market price) + 90 €/MWh (green certificate)</p>	<p>183 €/MWh = 33 €/MWh (market price) + 150 €/MWh (Minimum green certificate)</p>	<p>123 €/MWh = 33 €/MWh (market price) + 90 €/MWh (green certificate)</p>
	Flanders ⁹	<p>128 €/MWh = 33 €/MWh (market price) + 95 €/MWh (green certificate)</p>	<p>Onshore 128 €/MWh = 33 €/MWh (market price) + 95 €/MWh (green certificate) Offshore 128 €/MWh 33 €/MWh (market price) + 95 €/MWh (GC)</p>	<p>128 €/MWh = 33 €/MWh (market price) + 95 €/MWh (green certificate)</p>	<p>183 €/MWh = 33 €/MWh (market price) + 150 €/MWh (Minimum green certificate)</p>	<p>128 €/MWh = 33 €/MWh (market price) + 95 €/MWh (green certificate)</p>

⁶ In Belgium, the regulation of renewable energies is a competence of the regions which have set up a framework based on quotas and tradable green certificates.

⁷ In Wallonia the green certificate system came into effect on October 1st 2002. This new framework has placed an obligation on all suppliers (retailers) to source a percentage of their total sales of electricity from whatever eligible green sources (renewables and quality cogeneration). The quota for the first obligation period ending on 31 December 2003 has been set at 3%. This percentage will grow one point per year till 2007 –4% in 2004, 5% in 2005, 6% in 2006 and 7% in 2007–. The Government will decide upon further objectives in 2005 according to achievements. Green generators in Wallonia get a green certificate per each 456 kg of CO2 avoided emissions what means one green certificate per MWh for wind, smallhydro, biomass or solar PV but 3.3 MWh for a natural gas cogenerator and 6.2 MWh for a fuel oil cogenerator. Green certificates are valid during five years. Those suppliers which fail to reach each quarter the annual quota will have to pay a fine per green certificate missing of 75 € by 30 June 2003 and 100 € thereafter. The amount of the fine indicates the theoretical ceiling price of the certificates. The money coming from the fines will go to a public Fund to promote renewables. However, green generators will be entitled to sell their certificates to the Energy authority at minimum price of 65 € per certificate during ten years, according to a proposal still under discussion. Federal authorities have implemented a parallel system of minimum prices although some of them are below the Wallonian floor price: 20€/MWh for biomass, 50€/MWh for wind onshore installations and smallhydro, 150€/MWh for solar energy and 90€/MWh wind offshore plants.

⁸ Only hydro plants under 20 MW of power are entitled to get green certificates.

⁹ In Flanders, the green certificate framework came into effect on January 1st 2002. The framework has placed an obligation on all electricity suppliers to source a percentage of their total sales of electricity from eligible renewable sources. The quota has been set at 0.8% in 2002 and at 1.2% in 2003. This percentage will grow to 6% in 2010. Green generators in Flanders get a green certificate per each MWh they produce from wind, smallhydro, biomass or solar PV. Green certificates are valid during five years. Those suppliers which fail to reach the target have to pay a fine of 75 € per green certificate missing in 2002, 100 € in 2003 and 125 € thereafter. Federal authorities have implemented a system of minimum price: 20€/MWh for biomass, 50€/MWh for wind onshore installations and smallhydro, 150€/MWh for solar energy and 90€/MWh wind offshore plants.

EREF

European Renewable Energies Federation

Denmk.	No smallhydro	<u>Repowering</u> ¹⁰ 80 €/MWh <u>First two offshore</u> ¹¹ 61 €/MWh <u>New WT</u> ¹² 48 MWh = 34.6 €/MWh (electricity market price) + 13.3 €/MWh (premium) <u>Normal tariff old WT</u> ¹³ 56 €/kWh	<u>Straw & wood</u> 40 €/MWh ¹⁴ <u>Biogas</u> 80 €/MWh ¹⁵	200 €/MWh	
Finland ¹⁶	26 €/MWh (Market price) + 4.2 €/MWh (premium if < 1 MW) ¹⁷	26 €/MWh (Market price) + 6.9 €/MWh (premium) ¹⁸	<u>Wood chips</u> ¹⁹ 26 €/MWh (Market price) + 6.9 €/MWh (premium) <u>Biogas</u> ²⁰ 26 €/MWh (Market price) + 4.2 €/MWh (premium)	26 €/MWh (Market price) + 4.2 €/MWh (premium)	26 €/MWh (Market price) + 4.2 €/MWh (premium)

¹⁰ Fixed tariff for 10 years.

¹¹ Applicable only to Horns Rev and Rodsand windfarms for the first 44,000 full load hours.

¹² New wind turbines, no repowering, installed onshore after 1 January 2003. This price is paid for the first 20 years of operation. The premium will be paid only if the market price is at or below the reference level of 34.6 €/MWh. If the market price is higher than the reference level but below 48 €/MWh a premium will be added only until the 48 €/MWh. If the market price is higher than 48 €/MWh no premium will be added at all.

¹³ Current normal tariff for old wind turbines with less that 10 years. It is applicable for the first 22,000 full load hours onshore and for 10 years in some offshore windfarms.

¹⁴ Fixed tariff for 10 years.

¹⁵ Price for existing plants. Price for new plants is still under discussion.

¹⁶ All tariff premiums in Finland are paid from the State Budget. The electricity market (Nordpool) has been rather turbulent in Scandinavia last autumn and winter due to water scarcity. Nordpool prices have reached peaks of more than 100 €/MWh though prices today are much lower.

¹⁷ Plus a subsidy covering 30% of the investment costs

¹⁸ Plus a subsidy covering 30% of the investment costs.

¹⁹ Plus a subsidy covering 10%-25% of the investment costs.

²⁰ Plus a subsidy covering 10%-25% of the investment costs.

EREF

European Renewable Energies Federation

France²¹	<u>Operating before 2001</u> 73.24 €/MWh²² (winter) 29.45 €/MWh (summer)	<u>First five years operation²³</u> 83.5 €/MWh <u>Next ten years operation</u> 83.5 €/MWh (2000 h/y) 59.2 €/MWh (2600 h/y) 30.0 €/MWh (3600 h/y) Between=linear interpolation	<u>Biomass</u> 49 €/MWh²⁴ <u>Methanization</u> 46 €/MWh²⁵ <u>Landfill biogas²⁶</u> 57.2 €/MWh (< 2 MW) 45 €/MWh (> 6 MW) Between=linear interpolation	<u>Below specified limits²⁷</u> 152.5 €/MWh (General) 305 €/MWh (Corsica & Overseas) <u>Above limits</u> 44.2 €/MWh (General) 53.4 €/MWh (Corsica & overseas)	<u>Geothermal</u> 76.2 €/MWh²⁸
	<u>Comissioned after 2001</u> <u>if < 500 kVA</u> 85.48 €/MWh²⁹ (winter) 45.18 €/MWh (summer) <u>if > 500 kVA</u> 76.95 €/MWh³⁰ (winter) 40.71 €/MWh (summer)				

²¹ Feed-in tariffs applicable only to renewables plants up to 12 MW.

²² + bonus for regularity of 7.5 €/MWh.

²³ Feed-in tariffs applicable to windfarms up to 12 MW of capacity with purchase contracts signed in 2003. Contracts signed in 2002 and 2001 have tariffs 0.35% higher. Tariffs of signed contracts are updated every November 1st according to a coefficient which takes into account 60% of the increase rate of salaries and products. Tariffs applicable to futures windfarms will be reduced by up to 3.3% every year corrected by the 100% increase rate of salaries and products. Anyway, this tariff scheme is only applicable until the total installed wind power reaches 1,500 MW. Beyond this total amount tariffs will have a 10% decrease. Prices for Corsica are 10% higher. Once the first 15 years' contract finishes wind energy producers are entitled to a second 15 years' contract with a fixed tariff of 44.2 €/MWh..

²⁴ Plus energy efficiency premium from 0 to 12 €/MWh. Tariff guaranteed for 15 years.

²⁵ Plus energy efficiency premium from 0 to 12 €/MWh. Tariff guaranteed for 15 years.

²⁶ Plus energy efficiency premium from 0 to 3 €/MWh. Tariff guaranteed for 15 years.

²⁷ 5 kW if individual; 1000 kW if professional & apartment buildings; 150 kW if others. Tariff guaranteed for 20 years.

²⁸ Plus energy efficiency premium from 0 to 3 €/MWh. Tariff guaranteed for 15 years.

²⁹ Plus regularity premium from 0 to 15.2 €/MWh. Tariff guaranteed for 20 years. Winter is considered from November to March and summer from April to October, inclusively.

³⁰ Plus regularity premium from 0 to 15.2 €/MWh. Tariff guaranteed for 20 years.

EREF

European Renewable Energies Federation

<p>Germ.³¹</p>	<p>76.7 €/MWh (< 500 kW) 66.5 €/MWh (>500 kW <5000 kW)³²</p>	<p>88 €/MWh (At least first 5 years onshore and first 9 years offshore)³³ 60 €/MWh (minimum from year 6 to 20)³⁴</p>	<p>Biomass³⁵ 100 €/MWh (<500 kW) 90 €/MWh (< 5 MW) 85 €/MWh (< 20 MW)</p> <p>Landfill, sewage and mine biogas 76.7 €/MWh (< 500 kW) 66.5 €/MWh (> 500 kW < 5000 kW)³⁶</p>	<p>Solar PV & Solar Thermal electric 457 €/MWh³⁷</p>	<p>Geothermal³⁸ 89.5 €/MWh (< 20 MW) 71.6 €/MWh (> 20 MW)</p>
----------------------------------	---	---	---	--	---

³¹ These *fixed prices* shall be payable for plants commissioned during the year 2003 and for a runtime of 20 years, except for water power which runtime is unlimited.

³² The electricity produced from the first 500 kW will be paid at 76.7 €/MWh. The electricity beyond this level will be paid at 66.5 €/MWh.

³³ Starting from the date of commissioning. Offshore tariff applicable only for windfarms at least three miles seawards from a baseline near the coast and commissioned not later than 31 December 2006.

³⁴ This minimum tariff applies for turbines or windfarms that have generated 150% more power than the defined standard reference turbine, which is in practice a series of turbine types operating at an average wind speed of 5.5 m/s at a height of 30 m with a logarithmic height profile and a roughness length of 0.1 m in specific conditions, averaged over a period of five years using an internationally recognised and EU-approved power curve model. Wind turbines that produce less than the theoretical 150% reference-turbine limit are entitled to extend the period of the maximum tariff (88 €/MWh in 2003) by two months for every 0.75 percentage point by which production fails to reach 150% of the standard turbine's output. An annual decrease in the two tariff rates of 1.5% per year started in 2002. Therefore, wind farms commissioned in 2000 and 2001 are being paid 91 €/MWh for the first five years and 61.5 €/MWh as minimum price between years 6 and 20. Wind farms commissioned in 2002 are being paid 89.5 €/MWh and 60.8 €/MWh as minimum price between years 6 and 20. For wind farms commissioned before 1 April 2000, date when the Renewable Energy Sources Act came into force, the maximum payment period is calculated as five years minus half the number of years the turbine has been in operation, with a minimum period of four years starting in 2000.

³⁵ The electricity produced from the first 500 kW will be paid at 100 €/MWh, the electricity beyond this level will be paid at 90 €/MWh up to 5 MW and at 85 €/MWh from 5 MW to 20 MW. An annual decrease in the tariff rates of 1% per year started in 2002. Therefore, installations commissioned in 2000 and 2001 are being paid 102.3 €/MWh, 92.1 €/MWh and 87 €/MWh, following the same bands. Installations commissioned in 2002 are being paid 101 €/MWh, 91 €/MWh and 86 €/MWh, following the same bands.

³⁶ The electricity produced from the first 500 kW is paid at 76.7 €/MWh. The electricity beyond this level is paid at 66.5 €/MWh.

³⁷ An annual decrease in the tariff rate of 5% per year started in 2002. Therefore, solar installations commissioned in 2000 and 2001 are being paid 506.2 €/MWh whereas those commissioned in 2002 are being paid 481 €/MWh. Installations will be entitled to this tariff scheme only up to 350 MW are reached.

³⁸ The electricity produced from the first 20 MW will be paid at 89.5 €/MWh. The electricity beyond this level will be paid at 71.6 €/MWh.

EREF

European Renewable Energies Federation

Great Britain ³⁹	20 €/MWh (market price) + 66 €/MWh (Green Certificate) ⁴⁰	20 €/MWh (market price) + 66 €/MWh (Green Certificate) ⁴¹	20 €/MWh (market price) + 66 €/MWh (Green Certificate)	20 €/MWh (market price) + 66 €/MWh (Green Certificate)	20 €/MWh (market price) + 66 €/MWh (Green Certificate)
Greece ⁴²	62.9 €/MWh + 1.13 €/kW/month = Interconnected system	62.9 €/MWh + 0.81 €/kW/month = Interconnected system	62.9 €/MWh + 1.45 €/kW/month = Interconnected system	62.9 €/MWh + 0.81 €/kW/month = Interconnected system	<u>Geothermal</u> 62.9 €/MWh + 1.45 €/kW/month = Interconnected system
	77.8 €/MWh = non-interconnected islands	77.8 €/MWh = non-interconnected islands	77.8 €/MWh = non-interconnected islands	77.8 €/MWh = non-interconnected islands	<u>Geothermal</u> 77.8 €/MWh = non-interconnected islands

³⁹ Following powers given to the Government through the *Utilities Act 2000* and developed through the *Renewables Obligation Orders*, on 1 April 2002 the *Renewables Obligation* came into force in England, Wales and Scotland. This scheme has placed an obligation on all suppliers (retailers) to source a percentage of their total sales of electricity from whatever eligible renewable sources. The Obligation has been set at 3% in the first obligation period –that ended on 31 March 2003– rising to 4.3% in the following one year period, to 4.9% in the next until reaching 10.4% of sales in the year ending 31 March 2011. It will then remain constant until 31 March 2027, but may well be increased to meet more ambitious targets beyond 2011. Compliance with the Obligation will be demonstrated by presenting *Renewables Obligation Certificates (ROC)* to the regulator (Ofgem) at the end of each period. One *ROC* is issued by Ofgem for each MWh of eligible renewable electricity generated within the UK, its territorial waters and continental shelf, from RES stations built or refurbished after 1 January 1990, and physically supplied to customers in Great Britain. Suppliers can fulfil their obligation by purchasing ROCs with the power from an accredited generator, by buying ROCs on the market separately from the power or by paying to Ofgem a *buyout price* –set at 30 British pounds per MWh until 1 April 2003 and thereafter adjusted by Ofgem in line with the retail price index (set at 30.51 British pounds per MWh until 1 April 2004)–. This *buyout price* indicates the maximum theoretical price of ROCs. The *buyout* funds will be returned by Ofgem to suppliers who had fulfilled 100% of their obligation with ROCs in proportion to the number of ROCs that each of them had presented. Suppliers are able to bank ROCs for use only in the period after they are issued although limiting up to 25% of the supplier’s obligation what can be met by ROCs awarded in the previous period.

⁴⁰ Stations over 20 MW are only eligible if commissioned after the date of approval of the Obligation (31 March 2002). All existing hydropower stations under 20 MW built or refurbished after 1 January 1990 are eligible. All stations with a declared net capacity 1.25 MW or less are eligible regardless of their date of built or refurbishment.

⁴¹ Offshore wind projects are eligible to capital grants up to 40% of their costs with a maximum of 15 M€ plus additional grants from other Public Funds.

⁴² In Greece, the Transmission System Operator (TSO) is obligated to grant priority access to RES plants up to 50 MW (up to 10 MW for smallhydro plants) and to sign a 10-year contract (PPA) with the RES producers for the purchase of their electricity. Output is sold to the TSO at a predetermined buy-back rate, which is a fixed percentage (90%, if independent producers) of the consumer electricity price. Moreover, RES investments can get a 40% public subsidy on their total cost plus a 40% subsidy of the interest of loans obtained, following a detailed technical/economic evaluation. Alternatively, the latter subsidy can be combined with a 100% tax rebate on the investment costs. Investment-cost subsidies up to 50% (depending on RES type) can be obtained, alternatively (but not cumulatively), through the Greek Operational Programme for Competitiveness (CSF III), following rounds of public calls and subsequent competitive evaluation of the submitted RES investment proposals.

EREF

European Renewable Energies Federation

Ireland ⁴³	64.1 €/MWh (weighted average price)	Small Wind (< 3 MW) 52.97 €/MWh (cap price)=18% Less than cap price=72% (down to 47.23 €/MWh)	59.16 €/MWh (cap price)=12% Less than cap price=88%(down to 37.65 €/MWh)	No legal framework nor set price for PV electricity producers.	
		Large Wind (> 3 MW) 48.12 €/MWh (cap price)=5% Less than cap price=95%(down to 45.47 €/MWh)			
Italy ⁴⁴	46 €/MWh (electricity price) + 100 €/MWh (Green Certificate)	46 €/MWh (electricity price) + 100 €/MWh (Green certificate)	46 €/MWh (electricity price) + 100 €/MWh (Green certificate)	Net metering + 75% grant support ⁴⁵	46 €/MWh (electricity price) + 100 €/MWh (Green certificate)

⁴³ Prices for new plants under Alternative Energy Requirement V (AER V 2002). Since 1994, the development of electricity generating capacity from renewable energy has been encouraged through a series of Government supported *Alternative Energy Requirement (AER)* competitions. The AER involves a series of tendering competitions, in which prospective generators are invited to compete, based on price per unit of electricity, for contracts to sell electricity at a guaranteed prices for up to 15 years. Successful applicants are those who offer to sell the electricity at the lowest price at or below the cap price previously notified and published in the terms and conditions of the competition. The Irish Government launched in February 2003 the AER VI, aimed at adding 578 MW from renewable sources in Ireland by 2005.

⁴⁴ Italy is following the quota plus tradable green certificates model. From 2002 this scheme has placed an obligation on all conventional electricity producers or importers to inject into the grid during the year 2002 a quota or percentage of electricity from renewable power plants –which came on line after April 1, 1999– equal to 2% of the electricity produced or imported every year from conventional sources. The Obligation has been set at 2% although this quota should be increased by 0.3% every year starting from 2005. Renewable and cogeneration producers as well as the first 100 MWh per year produced by each company are excluded from the obligation. The Italian TSO (GRTN) issues one *Green Certificate* for each 100 MWh produced each year to qualified plants. Renewable plants can no longer obtain green certificates after eight years of operation and will have to compete on the electricity market. Compliance with the annual quota will be demonstrated by presenting enough *Green Certificates* to GRTN by 31 March of the following year. Green certificates related to one year expire completely after 31 March of the following year.

⁴⁵ Major PV plants will also benefit from Green certificates if their production in the year exceed 51,000 kWh, the minimum required to get GC.

EREF

European Renewable Energies Federation

<p>Lux.</p>	<p>31 €/MWh (Electricity price) + 25 €/MWh (premium)⁴⁶</p>	<p>31 €/MWh (Electricity price) + 25 €/MWh (premium)⁴⁷</p>	<p><u>Biomass & Biogas</u> 31 €/MWh (Electricity price) + 25 €/MWh (premium)⁴⁸</p>	<p><u>Solar PV</u> 500 €/MWh⁴⁹</p>	
--------------------	---	---	--	--	--

⁴⁶ Only for plants < 3 MW. Premium guaranteed for 10 years starting from the date of commissioning.

⁴⁷ Only for plants < 3 MW. Premium guaranteed for 10 years starting from the date of commissioning. There is also an investment subsidy of 75 €/kW if plant is > 500 kW with a maximum of 150,000 € per project. This amount is decreased annually by 10% from 2003.

⁴⁸ Only for plants < 3 MW. Premium guaranteed for 10 years starting from the date of commissioning. There are also investment subsidies between 25% and 50% of the total costs depending of the type of plant and fuel.

⁴⁹ Only for plants < 50 kW. Premium guaranteed for 20 years if plant is commissioned in 2003. The premium for plants commissioned in 2001 and 2002 amounts to 550 €/MWh. The premium for plants commissioned in 2004 will be of 450 €/MWh. An 50% investemt subsidy is also granted to solar PV with a maximum amount of 5,000 €/kW for individula households < 4 kW and 38,000 € for buildings.

EREF

European Renewable Energies Federation

Nether. ⁵⁰	33 €/MWh (Market price) + 68 €/MWh (Premium) ⁵¹	<u>Onshore</u> 33 €/MWh (Market price) + 49 €/MWh (Premium) ⁵² + 15 €/MWh (Green Certificate)	<u>Biomass (< 50 MW)</u> 33 €/MWh (Market price) + 68 €/MWh (Premium) + 15 €/MWh (Green Certificate)	<u>Solar PV</u> 33 €/MWh (Market price) + 68 €/MWh (Premium) + 15 €/MWh (Green Certificate)	<u>Tidal & wave</u> 33 €/MWh (Market price) + 68 €/MWh (Premium) + 15 €/MWh (Green Certificate)
		<u>Offshore</u> 33 €/MWh (Market price) + 68 €/MWh (Premium) + 15 €/MWh (Green Certificate)	<u>Biomass (> 50 MW)</u> 33 €/MWh (Market price) + 48 €/MWh (Premium) ⁵³ + 15 €/MWh (Green Certificate)		
			<u>Mixed streams</u> 33 €/MWh (Market price) + 29 €/MWh (Premium) ⁵⁴		
			<u>Landfill and Digestion</u> 33 €/MWh (Market price) + 15 €/MWh (Green Certificate)		

⁵⁰ As of the 1st of July 2003 a unique support system of renewables has come into effect in The Netherlands. Renewable generators derive their income from three different sources: the wholesale electricity market, the feed-in premium and the green certificate market. The producer sells its electricity on the electricity market like any other electricity producer and is paid the wholesale electricity price. In addition, based on its metered input the producer receives a premium. Finally, based on its production the producer receives green certificates from the National Transmission System Operator (TSO), TenneT, and sells them on the Green Certificate market at a market price. The premiums are differentiated according to different RES technologies. Their amount are determined annually by the Ministry of Economy in a Ministerial regulation with a maximum amount of 7 €/kWh. However, the level of the premium for any RES plant is fixed at the level of the tariff in the first year for a duration of 10 years following the start of the operation. The premiums are disbursed by the National Transmission System Operator (TSO), TenneT. As far as green certificates are concerned their demand in The Netherlands does not come from an obligation or quota legally imposed on consumers or suppliers such as in Italy, Belgium, Sweden or the UK but from electricity suppliers who need the certificates to ask for the ecotax exemption of 2.9 €/kWh on final consumers of renewable energies. Such an amount will be the maximum value of a green certificate in The Netherlands. However, it is expected that suppliers will pay renewable generators per certificate between 10 €/MWh and 20 €/MWh. The level of the ecotax exemption will be adjusted to inflation each year. The total level of operating support is thus determined by the sum of the premium and the ecotax exemption and guaranteed by the Government for a period of 10 years after the installation enters into operation. After the expiry of the premium period the RES plants remain however eligible for the ecotax exemption. Foreign renewable electricity is eligible for the ecotax exemption but not for the premium.

⁵¹ Hydropower is not eligible for the ecotax exemption and therefore does not receive green certificates.

⁵² This premium is granted only up to 18,000 full load hours.

⁵³ This premium is granted for the first three years of operation and thereafter it will be reduced.

EREF

European Renewable Energies Federation

Portug. ⁵⁵	72 €/MWh ⁵⁶	83.1 €/MWh (Up to 2000 h/y) 82 €/MWh (Up to 2200 h/y) 80.21 €/MWh (Up to 2400 h/y) 78 €/MWh (Up to 2600 h/y) 75.56 €/MWh (Up to 2800 h/y)	61.984 €/MWh	410 €/MWh (<5kW) 224 €/MWh (>5kW)	Wave 225 €/MWh
Spain ⁵⁷	64.9 €/MWh = 35.4 €/MWh (Pool price) + 29.5 €/MWh (Premium) ⁵⁸	62.1 €/MWh = 35.4 €/MWh (Pool price) + 26.7 €/MWh (Premium)	Energy crops 68.6 €/MWh = 35.4 €/MWh (Pool price) + 33.2 €/MWh (Premium) Biogas & Biomass residues 60.5 €/MWh = 35.4 €/MWh (Pool price) + 25.1 €/MWh (Premium)	Solar PV ⁵⁹ 397 €/MWh (< 5kW) = 35.4 €/MWh (Pool price) + 361.6 €/MWh (Premium) 217 €/MWh (>5 kW) = 35.4 €/MWh (Pool price) + 181.6 €/MWh (Premium) Solar Thermal Electric 155.6 €/MWh = 35.4 €/MWh (Pool price) + 120.2 €/MWh (Premium)	64.9 €/MWh = 35.4 €/MWh (Pool price) + 29.5 €/MWh (Premium)

⁵⁴ This premium is granted in proportion to the degree of biologically degradable material in the mix and only if the installation has a minimum total energy efficiency of 26%. Mixed streams are not eligible for the ecotax exemption and therefore do not receive green certificates.

⁵⁵ Portuguese feed-in tariffs are updated monthly according to inflation. Fixed prices for solar PV will be in place only until 50 MW are reached. Tariffs for wave energy will be in place only until 20 MW are reached.

⁵⁶ Smallhydro in Portugal is up to 10 MVA inclusive.

⁵⁷ Tariffs quoted are the fixed ones although most RES-E generators follow the variable prices made up of two elements: the hourly pool electricity price plus a fixed premium or incentive intended to internalise RES-E environmental benefits. These premiums differentiated for each technology amount in 2003 to 29.5 €/MWh (smallhydro, wave and geothermal), 26.7 €/MWh (wind energy), 33.2 €/MWh (energy crops), 25.1 €/MWh (biogas and waste biomass), 361 €/MWh (Solar PV < 5 kW), 181 €/MWh (Solar PV > 5 kW) and 120.2 €/MWh (Solar thermal electric). Fixed prices amounts are intended to be coincident with the variable sum total. However, the average spot market price is around 30 €/kWh in 2003, thus lower than estimated and guaranteed fixed prices. Both the premiums and the fixed prices are adjusted annually by the central Government "in line with the variation in the average electricity retail sale price, that shall be applied to sum total of the market price plus the premium". RES-E producers can only change from one system to the other once a year. Single RES plants are limited to 50 MW to be entitled to benefit from these support system.

⁵⁸ Smallhydro in Spain is up to 10 MW inclusive.

⁵⁹ The solar PV premium will be in place up to of 50 MW of total installed power are reached.

EREF

European Renewable Energies Federation

<p>Swed.⁶⁰</p>	<p>26 €/MWh (Nordpool price) + 23 €/MWh (Green certificate)</p>	<p>26 €/MWh (Nordpool price) + 23 €/MWh (Green certificate)⁶¹</p>	<p>26 €/MWh (Nordpool price) + 23 €/MWh (Green certificate)</p>	<p>26 €/MWh (Nordpool price) + 23 €/MWh (Green certificate)</p>	<p>26 €/MWh (Nordpool price) + 23 €/MWh (Green certificate)</p>
----------------------------------	---	--	---	---	---

⁶⁰ The Swedish green certificate framework came into force on May 1, 2003. Electricity production from solar power, wind power, geothermal energy, biomass, wave energy, small hydro (plants under 1.5 MW in operation at the end of April 2003) and hydro (plants up to 15 MW fulfilling certain conditions) are eligible for green certificates, called “elcertifikat” or electricity certificates. Green certificates are virtually issued and allocated every month by the Swedish National Transmission Operator (TSO) –Svenska Kraftnet– which will give to approved and registered green generators one certificate for each MWh of electricity produced in Sweden and reported from those renewable sources. The framework is a quota-based system, meaning that an obligation is placed on all electricity consumers to purchase an increasing proportion of their electricity consumption from renewable sources, starting from 7.4% in 2003 and reaching 16.9% in 2010. Consumers fulfill this obligation by buying from green generators enough certificates to cover such a quota and surrendering them to the Swedish Energy Agency. In practice, electricity distributing companies will take care of the obligation on behalf of their clients who do not give notice that they wish to manage their quota obligation themselves. Energy-intensive industry are exempted from the obligation in the initial phases of the scheme. Whether or not they will have an obligation in the future is under consideration. Any user/supplier who has surplus electricity certificates may sell them or save them for the needs of future years since green certificates have an unlimited life. The certificate price will be set on the market. However, there is a minimum price and a theoretical maximum price indicated by the penalty charge. The minimum price is the buy-out price at which the Swedish Energy Agency has to buy the certificates from the producers if they find no buyers for their certificates. This minimum price starts at 6.5 €/MWh in 2003 and will be thereafter gradually reduced and entirely phased out in 2008. There is also a penalty charge for those electricity consumers who do not fulfil their quota obligation by showing enough certificates. The penalty charge is 150 % of the average certificate price during the year, but with a maximum of 19.1 €/MWh for certificates to be surrendered during 2004 and 26.2 €/MWh for certificates for 2005 (plus taxes). The first brokered transaction of green certificates was completed last February between Sydskraft Energy Trading AB (E.ON Group) and Kraft&Kultur i Sverige AB. The deal was brokered by GreenStream Network Ltd. The green certificates market is still extremely thin since most deals are closed bilaterally between the green generators and the buyers. There are two types of contracts in the market: the *fixed volume contract* in which the buyer is guaranteed a certain amount of electricity and the *falling contracts* based upon an estimation of how much the green generator expects to produce. The former is usually a bit more expensive.

⁶¹ For large scale wind power plants, a special investment support will be granted related to technical development and market introduction.