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*WALLOON COMMISSION FOR ENERGY*

***SPECIFIC ANNUAL REPORT FOR 2004***

CD-5d26-CWaPE

*on*

*The Evolution of the Green Certificate Market*

*Issued in accordance with Article 22 of the Arrêté of 4 July 2002 concerning the promotion of green power*

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*2 May 2005*

## Specific annual report for 2004 by CWaPE on the evolution of the green certificate market

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### 1. Purpose

The Arrêté of 4 July 2002 concerning the promotion of green power specifies in its Article 22 that:

*« Art. 22. By 31 March, CWaPE shall issue a specific report concerning the evolution of the green certificate market. This report shall in particular mention the number of green certificates issued for each technology and source during the year in question, the green certificates supplied to CWaPE as per Article 21, the average price of a green certificate and the fines imposed on system operators and suppliers for non-compliance with quotas. This report shall be supplied to the Walloon Government".*

Article 21 of the same Arrêté specifies that:

*« Art.21 paragraph 1. At the end of the second month following the end of a quarter, system suppliers and operators shall supply CWaPE with a number of green certificates consistent with the quota imposed on them by this Article. For this purpose, they shall notify CWaPE of the number and characteristics of the green certificates they intend to include in their quota, as well as the total power supplied in the Walloon Region during the quarter under consideration.*

....

*paragraph 3. The quota shall be:*

*3% between 1 January 2003 and 31 December 2003;*

*4% between 1 January 2004 and 31 December 2004;*

....

## **2. The green certification system**

### **2.1. Legal framework and goals**

Within the scope of European directive 96/92/EC<sup>1</sup> concerning common rules for the internal market in electricity, the Walloon Region, within its area of competence relating to power distribution (grids with a voltage under 70 kV), adopted a Décret on 12 April 2001 concerning the organization of the electricity market, hereafter referred to as the Décret.

This Décret covers the following concerns in particular:

- the gradual opening-up of the market for consumers and the introduction of a principle of competition between producers/suppliers
- the determination of the rules by which the market operates under the control of a public body: the Walloon Energy Commission (CWaPE)
- the determination of public-service obligations binding the market operators, including a green-certificate system to encourage all effective technologies for the generation of power from renewable energy and cogeneration.

On 4 July 2002, the Walloon Government adopted the Arrêté concerning the promotion of green power. This Arrêté, hereafter referred to as AGW-PEV, supplies a detailed description of the green certificate system applicable in Wallonia.

The supporting mechanism for the generation of green power set up in the Walloon Region is also based on the following European directives:

- Directive 2001/77/EC of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market
- Directive 2004/8/EC of 11 February 2004 on the promotion of cogeneration based on a useful heat demand in the internal energy market

These directives make the promotion of green power a European priority due to its contribution to:

- the safety and diversification of the energy supply
- environmental protection (and in particular the reduction of greenhouse gas emissions) and sustainable development
- the reinforcement of competition on the internal power market
- economic (regional and local development) and social (job creation on a local scale) cohesion.

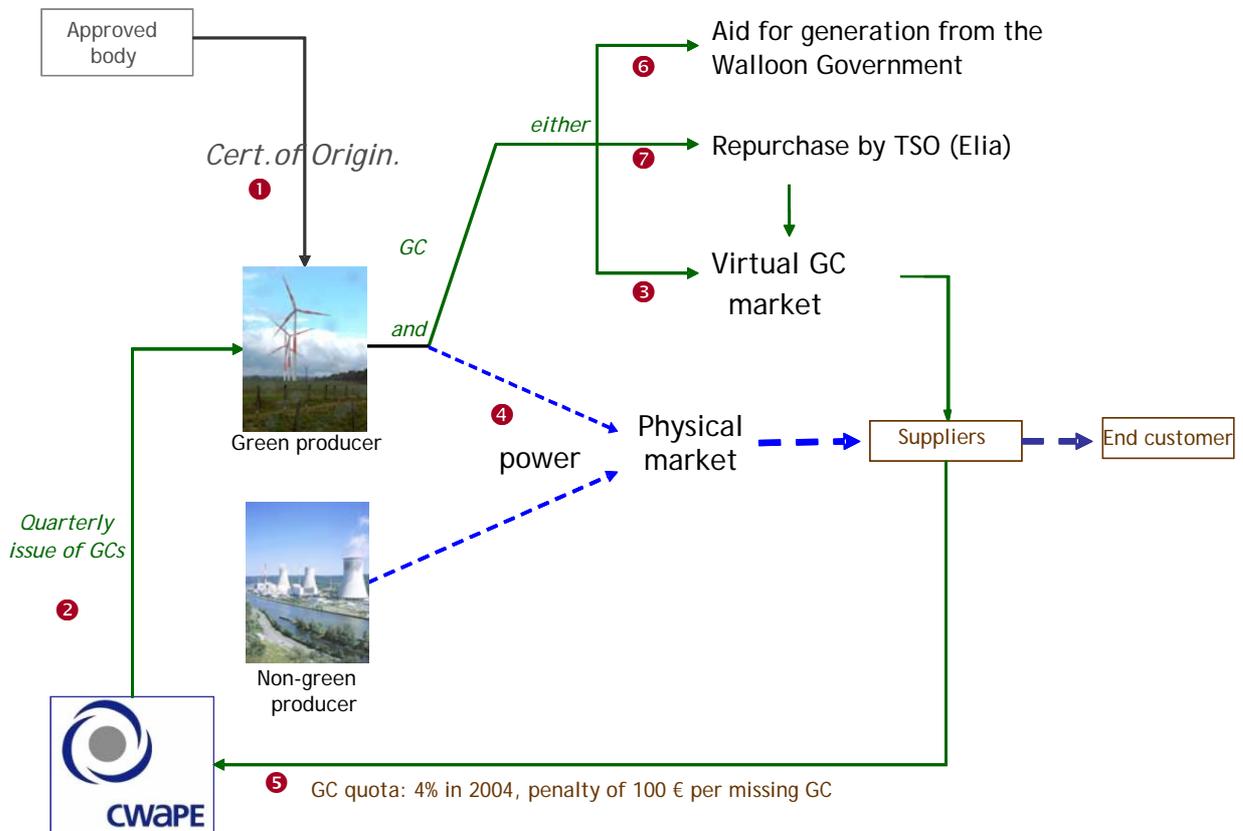
For these reasons, and in order to achieve national targets, these directives explicitly specify that the Member States shall set up supporting mechanisms for green certificate systems.

Moreover, on 6 November 2003, the Walloon Government adopted an Arrêté on aid for the generation of green power. On 16 July 2002, the Belgian federal government also adopted the Royal Decree on the setting-up of mechanisms for the purpose of promoting power generated from renewable energy sources and creating a minimum-price system for the purchase of green certificates by transmission system operators.

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<sup>1</sup> This has since been repealed by Directive 2003/54/EC concerning common rules for the internal market in electricity.

## 2.2. The principle of the green certificate system



All green power generation units must submit a prior application to CWaPE for the issuance of green certificates. A certificate of origin (1) issued by an approved inspection body must be attached to this application.

Once this preliminary application for certification has been accepted by CWaPE, the producer supplies its quarterly energy metering statements to CWaPE. On the basis of these statements, CWaPE issues (2) a given number of green certificates.

Once in possession of the green certificates, producers may sell them to any purchaser (3), regardless of physical power sales (4).

Each quarter, power suppliers must return to CWaPE a quota of green certificates<sup>2</sup> proportional to the quantity of power supplied<sup>3</sup>. A fine of 100 euros per missing certificate is levied (5).

As an alternative solution to the disposal of green certificates issued to facilities generating power from renewable energies, an aid system has been set up by the Walloon Government<sup>2</sup> (6).

A system imposing the repurchase of green certificates by the transmission system operator (Elia) at a minimum price is also imposed by the Federal Government. Green certificates purchased by the transmission system operator are then resold on the virtual green certificate market (7).

<sup>2</sup> Further to this operation, the green certificates are deleted from the database.

<sup>3</sup> However, a quota reduction is applied for the benefit of consumers consuming over 5 GWh per quarter and operations centre.

### 2.3. The main concepts relating to the issuance of green certificates

#### - Definition of green power generation (Décret, Art. 2) -

*Renewable energy sources:* any energy source other than fossil fuels and nuclear fission, the consumption of which does not limit its future use, in particular hydraulic energy, wind energy, solar energy, geothermal energy, biogas, organic products and waste from agriculture and forestry, and the biodegradable organic portion of waste (Décret, art. 2, 4°).

*High-quality cogeneration and trigeneration:* combined generation of heat and power, designed according to the customer's heat or cold requirements, which saves energy compared with the separate generation of the same quantities of heat and power (and if applicable of cold) in modern reference facilities, the annual operating yield of which is defined and published annually by CWaPE (Décret, art.2, 3°).

*Green power:* power generated from renewable or high-quality cogeneration sources, the generation system for which generates a minimum saving of 10% on carbon dioxide emissions compared with the emissions defined and published annually by CWaPE for traditional generation in modern reference facilities. Power generated using hydroelectric or high-quality cogeneration facilities is limited to a capacity of less than 20 MWe (Décret, art. 2, 5°).

#### - Principles of issuance of green certificates (Décret, art. 38) -

*A green certificate* is a transferable certificate issued by CWaPE to producers of green power for a number of kWh generated which is equal to MWe divided by the carbon dioxide saving rate (Décret, art. 38, paragraph 2, line 1 and paragraph 3). Entitlement to green certification is limited to ten years for each generation site (AGW-PEV, art. 10).

*The carbon dioxide saving rate* is calculated by dividing the carbon dioxide gain achieved by the system under consideration by the carbon dioxide emissions of the traditional reference electric system (steam and gas turbine - STAG - AGW-PEV, art.11), the emissions of which are defined and published annually by CWaPE. This carbon dioxide saving rate is limited to 1 for generation units producing over 5 MW, and 2 below that limit. (Décret, art. 38, paragraph 2, line 2).

*The carbon dioxide emissions* are those generated by the green power generation as a whole and include fuel production, emissions during combustion if applicable, and waste processing if applicable. The facility emissions are taken into account in the case of hybrid facilities (Décret, art. 38, paragraph 2, line 3).

*The carbon dioxide emission coefficients* for each green power generation system under consideration are approved by CWaPE (Décret, art. 38, paragraph 23, line 4).

## 2.4. Conditions and procedure for the issuance of green certificates

### - Green power metering procedures and code -

Green certificates are issued both for green power consumed by the producer and green power dispatched to the grid or transmitted via direct lines, with the exception of green power exported outside Belgium (AGW-PEV, art. 10, line 3).

Green certificates are calculated on the basis of the net power generated (Eenp) measured prior to transformation and dispatch to the grid (if applicable). The net power generated is the power generated minus the power required by the generation unit's operating equipment or used for the preparation of the renewable energy sources required for power generation (AGW-PEV, art. 10, line 4).

*A metering code*<sup>4</sup> drawn up by the Minister as per Article 6 of AGW-PEV of 4 July 2002 describes the principles and methods applicable to the metering of the quantities of energy taken into account for the calculation of the number of green certificates to be issued to green power generation facilities.

### - Certification of a green power generation facility -

Green certificates are issued for the generation of green power only if a certificate of origin has been issued to the green power generation facility by an inspection body approved<sup>5</sup> by the Minister in charge of energy (AGW-PEV, art. 6 and 9).

This certificate of origin must, in particular, mention the energy sources used, the generation technology, the net developable capacity of the facility, and certify that the energy metering used for the calculation of the number of green certificates complies with the Metering Code.

The certificate of origin supplies the metering algorithms, i.e. the mathematical operations which enable the various quantities of energy to be calculated. The main algorithms are:

- the metering algorithm for the net power generated (Eenp)
- the metering algorithm for the net heat recovered (Eqnv)
- the metering algorithm for the net cooling energy recovered (Efnv)
- the metering algorithm for entering energies (Ee).

### - Prior application for the issuance of green certificates -

To achieve green certification, the producer must first apply to CWaPE for the issuance of green certificates. A copy of the certificate of origin shall be attached to this application. CWaPE checks that the prior application for the issuance of green certificates includes all the information required and complies with the legislation, and makes its decision known. Entitlement to the issuance of green certificates is guaranteed for ten years as of the date of notification of acceptance by CWaPE.

<sup>4</sup> See the Ministerial Arrêté of 1 June 2004 describing the metering procedures and code applicable to the metering of quantities of energy, published in the Moniteur belge of 17/09/2004 - Annex "Green power metering and code for the Walloon Region".

<sup>5</sup> The list of approved inspection bodies is available on the CWaPE website: [www.cwape.be](http://www.cwape.be). The list of bodies approved as of 31 December 2004 is available on Page 15.

**- Method for the calculation of green certificates -**

The number of green certificates (GCs) issued is equal to the CO<sub>2</sub> saving rate ( $\tau$ ) multiplied by the net power generated by the facility ( $E_{\text{enp}}$ , expressed in MWh<sub>e</sub>):

$$\text{Number of GCs} = \tau \times E_{\text{enp}} \quad (1)$$

The number of green certificates issued is proportional to the net power generated. It also depends on the overall performance of the facility in terms of CO<sub>2</sub> saving.

To determine the CO<sub>2</sub> saving rate ( $\tau$ ), CWaPE annually defines and publishes (see table below) the annual operating efficiency<sup>6</sup> and CO<sub>2</sub> emissions of modern reference facilities for the separate production of electricity ( $E_{\text{ref}}$ ), heat ( $Q_{\text{ref}}$ ) and cold ( $Q_{\text{f,ref}}$ ), with which the green power generation facilities will be compared.

<u>Reference of traditional electrical system :</u>			<u>REFERENCE</u>
<b>natural gaz-fired STAG power station</b>	efficiency emission coefficient	$\eta_e = 55\%$ 251 kgCO <sub>2</sub> /MWh <sub>p</sub>	$E_{\text{ref}} = 251/0,55 = 456 \text{ kgCO}_2/\text{MWh}_e$
<b>Thermal reference natural gas boiler</b>	<b>natural gas distribution area</b> efficiency emission coefficient	$\eta_q = 90\%$ 251 kgCO <sub>2</sub> /MWh <sub>p</sub>	$Q_{\text{ref GN}} = 251/0,90 = 279 \text{ kgCO}_2/\text{MWh}_q$
<b>Thermal reference fuel oil boiler</b>	<b>outside natural gas distribution area</b> efficiency emission coefficient	$\eta_q = 90\%$ 306 kgCO <sub>2</sub> /MWh <sub>p</sub>	$Q_{\text{ref HGN}} = 306/0,90 = 340 \text{ kgCO}_2/\text{MWh}_q$
<b>Cooling reference Compression group</b>	<b>Cooling set point &lt; 0°C</b> Performance coefficient emission coefficient	$\text{COP}_{\text{ref}} = 2$ 456 kgCO <sub>2</sub> /MWh <sub>e</sub>	$Q_{\text{f,ref}} = E_{\text{ref}} / \text{COP}_{\text{ref}} = 228 \text{ kgCO}_2/\text{MWh}_f$
<b>Cooling reference Compression group</b>	<b>Cooling set point ≥ 0°C</b> Performance coefficient emission coefficient	$\text{COP}_{\text{ref}} = 4$ 456 kgCO <sub>2</sub> /MWh <sub>e</sub>	$Q_{\text{f,ref}} = E_{\text{ref}} / \text{COP}_{\text{ref}} = 114 \text{ kgCO}_2/\text{MWh}_f$

The CO<sub>2</sub> emissions of reference modern facilities for the generation of cold are calculated on the assumption that the compression unit is powered via the traditional power system.

<u>In which:</u>	
MWh <sub>p</sub> :	Megawatt/hour of primary energy
MWh <sub>e</sub> :	Megawatt/hour of net power generated
MWh <sub>q</sub> :	Megawatt/hour net thermal recovered
MWh <sub>f</sub> :	Megawatt/hour net cooling recovered

Annual operating efficiency and carbon dioxide emissions of the traditional power generation system as well as of reference modern heat and cold generation facilities

(CwaPE Management Committee of 20 April 2004 - Published in Moniteur belge of 15 June 2004)

<sup>6</sup> For a given green power generation site, the efficiency of the reference modern facilities remains the value current at the time of the issuance of the first green certificates for the site concerned.

In the absence of a green power generation facility, the net electrical energy generated ( $E_{enp}$ ) would have been generated by the reference system. The green power generation system therefore prevents the emission of a quantity of CO<sub>2</sub> equal to  $E_{enp} \times E_{ref}$ .

In the absence of a green power generation facility, the net heat recovered ( $E_{qnv}$ ) would have been generated by the reference heat generation system. The green power generation system therefore prevents the emission of a quantity of CO<sub>2</sub> equal to  $E_{qnv} \times Q_{ref}$ .

In the absence of a green power generation facility, the net cold recovered ( $E_{fnv}$ ) would have been generated by the reference cold generation system. The green power generation system therefore prevents the emission of a quantity of CO<sub>2</sub> equal to  $E_{fnv} \times Q_{f,ref}$ .

However, in a number of cases, a green power generation facility releases a quantity of CO<sub>2</sub>, depending on the fossil and renewable fuels used ( $C_{filière}$ )<sup>7</sup>. In such cases, the green power generation facility releases a quantity of CO<sub>2</sub> equal to  $E_e \times C_{filière}$ .

The CO<sub>2</sub> gain made by the green power generation facility is therefore equal to the difference between the sum of the total CO<sub>2</sub> emissions prevented minus the quantity of CO<sub>2</sub> released, i.e.:

$$\text{CO}_2 \text{ gain} = \text{CO}_2 \text{ prevented} - \text{CO}_2 \text{ released} \quad (2)$$

In which:

$$\begin{aligned} \text{CO}_2 \text{ prevented} &= [\text{E}_{enp} \times \text{E}_{ref} + \text{E}_{qnv} \times \text{Q}_{ref} + \text{E}_{fnv} \times \text{Q}_{f,ref}] \\ \text{CO}_2 \text{ released} &= [\text{E}_e \times \text{C}_{filière}] \end{aligned}$$

The CO<sub>2</sub> saving rate ( $\tau$ ) has been set by convention at the ratio of the carbon dioxide gain achieved by the green power generation facility to the carbon dioxide emissions of the traditional generation system generating the same quantity of electricity ( $E_{enp}$ ), and therefore:

$$\tau = \text{CO}_2 \text{ gain} / (\text{E}_{enp} \times \text{E}_{ref}) \quad (3)$$

In other words, green certificates are issued to a green power generation facility each time the latter has prevented the emission of the quantity of CO<sub>2</sub> released by the reference traditional generation system for the generation of 1 MWh (E<sub>ref</sub>). The current E<sub>ref</sub> value is 456 kg CO<sub>2</sub>/MWh.

The following paragraph presents a number of typical cases involving the issuance of green certificates. The calculations are valid provided the CO<sub>2</sub> saving rate exceeds 10% and the facility capacity is less than 5 MW. For further information, a brochure and software are available on the CWaPE website, which supply a more detailed description of the calculation methods to be applied to most green power generation systems.

<sup>7</sup> The methods and the list of conventional CO<sub>2</sub> emission coefficients already approved by CWaPE are included in a statement by CWaPE dated 1 June 2004 (CD-4f01-CWaPE).

## - Case studies -

### Case 1: Wind turbine, hydroelectric or photovoltaic plant

As the facility does not release any CO<sub>2</sub>, it can be said that the production of 1 MWh by such a facility saves the CO<sub>2</sub> which would have been released by the reference power generation facility. This is known as the CO<sub>2</sub> gain and is 456 kg of CO<sub>2</sub>.

Moreover, the saving rate is calculated as the quotient of the CO<sub>2</sub> gain and the quantity of CO<sub>2</sub> released by the reference power generation facility, i.e. 456 kg of CO<sub>2</sub>.

The CO<sub>2</sub> saving rate is therefore 1, meaning that the producer receives 1 GC for each net MWh generated.

### Case 2: Biomass burning power station

A biomass burning power station may release some CO<sub>2</sub> when fossil energy has been used for the preparation and transport of the fuel. In this example, an arbitrary value of 50 kg CO<sub>2</sub>/net MWh generated is used.

However, this facility does ensure that less CO<sub>2</sub> is released than by the reference generation facility for the generation of the same quantity of electricity. This is known as the CO<sub>2</sub> gain and is 406 (=456-50) kg CO<sub>2</sub>/net MWh generated.

Moreover, the saving rate is calculated as the quotient of the CO<sub>2</sub> gain and the quantity of CO<sub>2</sub> released by the reference power generation facility, i.e. 456 kg of CO<sub>2</sub>.

The CO<sub>2</sub> saving rate is therefore 0.89 (= 406/456), which means that the green producer is issued 0.89 GC for each net MWh generated.

### Case 3: Natural gas cogeneration unit

Cogeneration, in particular when fossil energy is used, generates CO<sub>2</sub>. However, it saves the CO<sub>2</sub> which would have been released by a reference power station and reference boiler to generate an equivalent quantity of power and heat. By combining both types of generation (power and heat), green-quality cogeneration enables less CO<sub>2</sub> to be released than by the separate reference facilities.

This example involves natural gas cogeneration, which, to generate 1 MWh of power, consumes 3 MWh of natural gas ( $\alpha_e = 33.33\%$ ) but recovers 1.5 MWh of heat ( $\alpha_q = 50\%$ ).

The generation of 1 MWh of power by cogeneration prevents the emission of the 456 kg of CO<sub>2</sub> by the reference power station.

It also prevents the emission of 418.5 kg of CO<sub>2</sub> (= 1.5 MWh of heat x 279 kg of CO<sub>2</sub>/MWh of heat by reference facility) by the reference natural gas boiler.

However, the cogeneration facility has consumed 3 MWh of natural gas and has therefore released 753 kg of CO<sub>2</sub> (= 3 MWh of natural gas x 251 kg CO<sub>2</sub>/MWh for the gas).

The CO<sub>2</sub> gain is calculated by subtracting the quantity of CO<sub>2</sub> released by the green power generation facility from the quantities of CO<sub>2</sub> prevented at the reference facilities. In this example, this is (456 kg CO<sub>2</sub> + 418.5 kg CO<sub>2</sub> - 753 kg CO<sub>2</sub>)/MWh = 121.5 kg CO<sub>2</sub>.

The CO<sub>2</sub> saving rate is calculated by dividing the CO<sub>2</sub> gain by the CO<sub>2</sub> emission of the reference power station, i.e.: 121.5 kg CO<sub>2</sub> / 456 kg CO<sub>2</sub> = 0.266.

The green producer receives 0.266 green certificate per net MWh generated.

## 2.5. Impact of the green certificate system on green producers

The maximum income a green producer may expect from a green certificate system is directly linked to the amount of the fine:

$$\text{Max. income} = \tau \times \text{Fine} \quad (\text{EUR/MWh})$$

The following table supplies (for information purposes) the maximum theoretical income (not including taxes) a green producer may expect according to the generation system used.

System	CO2 saving rate (for information purposes)	Maximum theoretical income (not including taxes) (EUR/MWh)
Photovoltaic	1	100 € (150 € with Elia)
Hydraulic	1	100 €
Wind power	1	100 €
Biomass	0.7 to 1	70 to 100 €
Biomass cogeneration	1 to 2	100 to 200 €
Fossil fuel cogeneration	0.1 to 0.4	10 to 40 €

This income could even be higher when tax-related aspects are taken into consideration, as the purchase of green certificates, unlike fines, is tax deductible in the case of suppliers subject to corporate tax.

## 2.6. The green certificate market

### - The supply: green certificates issued to green producers - (AGW-PEV, art. 10/11)

Each green producer supplies its metering statements to CWaPE on a quarterly basis. On the basis of these statements and of the metering algorithms supplied in the certificate of origin, certified green power generation facilities are issued a number of green certificates proportionate to the number of MWh generated during the past quarter and to the CO2 saving rate calculated by CWaPE for the quarter. Green certificates issued by CWaPE are valid for 5 years. CWaPE issues green certificates on a quarterly basis and in an intangible form. This issuance is free of charge. Further to each issuance, CWaPE sends green producers an account statement specifying the details of the issuance and the status of the account.

### - Organization -

The database (AGW-PEV, art. 15 and 17):

The authenticity of green certificates is guaranteed by their registration in a centralised database managed by CWaPE. This contains an inventory of green certificates issued, their certificate of origin, their date of issuance, their holder and the operations recorded (issuance, transactions, restitution for quota, expiry of validity).

Transactions:

CWaPE must be notified of all transactions involving green certificates so that they can be authenticated and recorded in the green certificate register.

The market actors negotiate the transfer of green certificates independently of CWaPE. Once the transaction is completed, the seller notifies CWaPE of the transfer of the green certificates by filling in the appropriate form and complying with the procedure set up by CWaPE<sup>8</sup>.

Further to each transaction, CWaPE sends the parties an account statement with the details of the transactions performed and the status of their account.

Intermediaries:

Any individual or body which registers with the CWaPE database may perform green certificate transactions. It is therefore likely that ultimately some end customers will decide to purchase the green certificates relating to their consumption on the market and sell them to their electricity providers in return for special electricity prices (outside the factors linked to the green certificates).

Moreover, one or more institutions could organize a green certificate exchange. The advantage of this system would be that it would guarantee the confidentiality of transactions with respect to buyers and sellers.

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<sup>8</sup> See "Certificats verts: modalités pratiques" brochure.

## - The demand: the quota return for suppliers -

### Obligations:

Each supplier must supply CWaPE on a quarterly basis<sup>9</sup> with a number of green certificates consistent with the number of MWh supplied to its end customers located in the Walloon Region multiplied by the current quota. In the case of system operators, the quota is applicable to the power supplied by them to end customers and to their own power consumption (AGW-PEV, art. 21, paragraphs 1 and 2).

The quota return procedure for suppliers includes four stages:

1. quarterly supply statements supplied to CWaPE
2. number of green certificates to be supplied calculated by CWaPE on the basis of the quota, with reductions if applicable
3. "quota return" green certificates supplied to CWaPE. Green certificates thus supplied are deleted from the database
4. calculation by CWaPE of the fines to be levied if the number of green certificates supplied is inadequate.

The quota to be achieved by suppliers and system operators is as follows (AGW-PEV, art. 21, paragraph 3):

- 3% from 01/01/2003 to 31/12/2003
- 4% from 01/01/2004 to 31/12/2004
- 5% from 01/01/2005 to 31/12/2005
- 6% from 01/01/2006 to 31/12/2006
- 7% from 01/01/2007 to 31/12/2007

These rates have been calculated on the basis of the potential evolution of green power generation. Depending on the evolution of the green power market, the Walloon Government may revise these quotas (AGW-PEV, art. 22).

A proposal for the quotas applicable as of 1 January 2008 will be made to the Walloon Government by CWaPE in 2005, taking into account the development of the green certificate market in the Walloon Region. The purpose of this proposal will be to create the conditions for a solvent market for all green certificates issued in the Walloon Region (AGW-PEV, art. 21).

Green certificates included in the quotas must have been issued on Belgian territory.<sup>10</sup> However, green certificates issued by the other Belgian regions or by the federal authorities (North Sea licences) may only be included if Walloon green certificates can be included in the quotas of these other regions or in the federal quota (AGW-PEV, art. 23).

<sup>9</sup> Before the end of the second month after the end of the quarter under consideration (i.e. by 30 April, 31 July, 31 October and 28/29 February)

<sup>10</sup> Green certificates issued for power generated outside Belgium may be included in the quota subject to a bilateral agreement and mutual recognition by the parties.

Sanctions (AGW-PEV, art. 24):

In case of failure to comply with the required quotas, the supplier or system operator shall pay an administrative fine for the quarter concerned. The current amount of the fine is 100 euros per missing certificate. The Décret specifies that the Walloon Government may set the amount of this fine at 75 to 125 euros per missing certificate<sup>11</sup>.

Reductions (AGW-PEV, art. 21, paragraph 4):

In 2004, the quota initially imposed by the legislation was amended. The Government decided to limit the impact of the cost of green certification on industrial heavy-use end customers to respond to the economic difficulties encountered by the latter within the context of intense international competition. As of 1 January 2004, the number of green certificates required of suppliers supplying an end customer consuming over 5 GWh at one operations centre during the quarter under consideration and which has signed an agreement with the Walloon Region to improve its short-, medium- and long-term energetic efficiency (e.g. sectoral agreements, etc.) may be reduced.

The reduction granted for each operations centre is:

- 1/4 of the quota for the portion of the quarterly power consumption from 5 to and including 25 GWh
- Z, for the portion of the quarterly power consumption over 25 GWh,  $Z = \text{quota} - 2$ . This ultimately means a fixed quota of 2% for this portion, whatever the quota required of the suppliers.

When the end customer is supplied by several suppliers at the same operations centre, the reduction in the number of green certificates is distributed pro rata between the suppliers according to the volumes supplied by each.

Cost reductions subsequent to the provisions of this paragraph are passed on directly to each of the end customers by which they have been generated.

Example concerning the 2004 quotas:

Take an end customer which meets the requirements for the quota reduction and consumes 35 GWh during one quarter. For the portion between 0 and 5 GWh, this customer's supplier will need to meet the full quota requirements, i.e., in 2004, 4% of 5000 MWh, i.e. 200 GCs. For the second portion, between 5 GWh and 25,000 MWh, the supplier must fulfil a quota reduced by 25%, i.e.  $(4\% \times \frac{3}{4}) \times (25,000 - 5000) \text{ MWh} = 600 \text{ GCs}$ . For the third portion, over 25 GWh, the supplier's quota is cut to 2%, i.e.  $2\% \times (35,000 - 25,000) \text{ MWh} = 200 \text{ GCs}$ . In all, the supplier must supply 1000 GCs.

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<sup>11</sup> Art. 53, paragraph 2

### - Aid to generation by the Walloon Government -

On 6 November 2003, the Walloon Government adopted an Arrêté on aid to the generation of green power. The Ministerial Arrêté of 24 May 2004 specifies the procedures and conditions for application for and granting of aid to generation. Producers of green power generated from renewable energy sources, the facilities of which were commissioned after 30 June 2003 and which have signed an agreement with the Minister may turn over all or part of the green certificates they have been issued to the Minister. This agreement shall mention the period for which aid to generation is guaranteed. This period may not exceed 120 months as of the month following which the facility is commissioned.

The aid to generation accumulated during the period under consideration offsets the extra cost of generation with respect to the market price<sup>12</sup> during the write-down period for the facility concerned, including the return on the capital invested. The aid to generation granted by the Minister in exchange for the green certificates shall be 65 EUR/GC<sup>13</sup>.

The decision whether to apply for aid to generation or sell the green certificates on the green certificate market is made by the producer each time the latter sends its quarterly metering statements. The Walloon Region sends a request for the cancellation of the green certificates it holds to CWaPE so that they are deleted from the database.

### - The minimum repurchase price federal system -

Within the scope of its public-service mission, and in application of *the Royal Decree of 16 July 2002 on the setting-up of mechanisms to promote electricity generated from renewable energy sources*, the transmission system operator (Elia) is obliged to purchase green certificates granted to a green power producer from the latter at a minimum set price which depends on the generation technology:

<b>Generation technology</b>	<b>Price per green certificate</b>
Offshore wind energy	90 €
Onshore wind energy	50 €
Hydraulic energy	50 €
Solar energy	150 €
Other renewable energy sources (including biomass)	20 €

This obligation takes effect when the generation facility is commissioned, for a period of ten years. In practice, only photovoltaic facilities are concerned in the Walloon Region, as only in that case is the repurchase price by the system operator (150 EUR/GC) higher than the 100-euro fine per missing certificate.

The system operator (Elia) must offer these certificates on the market in order to recoup the cost of this obligation. The net difference between the purchase price of the green certificates by the system operator and the selling price on the market is financed by a surcharge on the tariffs for connection to and use of the grid.

<sup>12</sup> This market price is set by CWaPE. The method used by CWaPE is described in detail in its statement CD-5d05-CWaPE of 7 April 2005.

<sup>13</sup> Depending on the technology, the agreement may stipulate a higher amount, which may not, however, exceed the amount of the fine.

### 3. Results for 2004

#### 3.1. Generation facilities

##### Generation facility certification:

Three inspection bodies accredited by BELTEST as per the NBN 45004 standard and approved by the Minister of Energy issue certificates of origin to green power generation facilities.

These bodies are:

- VINCOTTE
- BUREAU TECHNIQUE VERBRUGGHEN
- SGS BUREAU NIVELLES

Facilities certified in 2004 include:

- two photovoltaic facilities with a nominal capacity of 1 kW (SOLWASTER and ISSOL)
- two wind turbines with a capacity of 630 kW (CHAMP DE RANCE and TCHERETTES)
- four hydroelectric plants (Ourthe Complex, Vesdre Complex, RABORIVE station and Moulin de JEHOULET) with a capacity of 2.3 MW
- three biomass generation facilities (the ITRADEC sorting facility at Havré, the A.I.V.E. water purification facility at Marche and the IDELUX landfill centre at Habay-la-Neuve) with a total capacity of almost 2 MW
- a 40-kW biomass cogeneration unit (HECK farm) and a hybrid cogeneration unit (natural gas + biogas) with a capacity of 5.5 MW (FONTENOY sugar plant)
- two natural-gas cogeneration units (MINERVE and SWEDEPONIC) with a capacity of over 1.1 MW.

Besides issuing the certificates of origin, the three approved bodies perform annual inspections of all certified sites to ensure compliance with the data on the certificate of origin. Amendments to the certificate of origin are also issued if the measuring equipment or any other information specified on the certificate of origin is changed.

##### Green power generation sites:

At the end of 2004, 82 green power generation sites met the requirements for the issuance of green certificates. Their total capacity was over 306 MW (see Annex 1).

<u>Situation at the end of 2004</u>	<u>Number of sites</u>	<u>Capacity (kW)</u>
Photovoltaic	2	2
Hydraulic	43	103,503
Wind	6	22,701
Biomass	9	16,350
Biomass cogeneration	8	41,286
Fossil cogeneration	14	122,621
Total	82	306,463

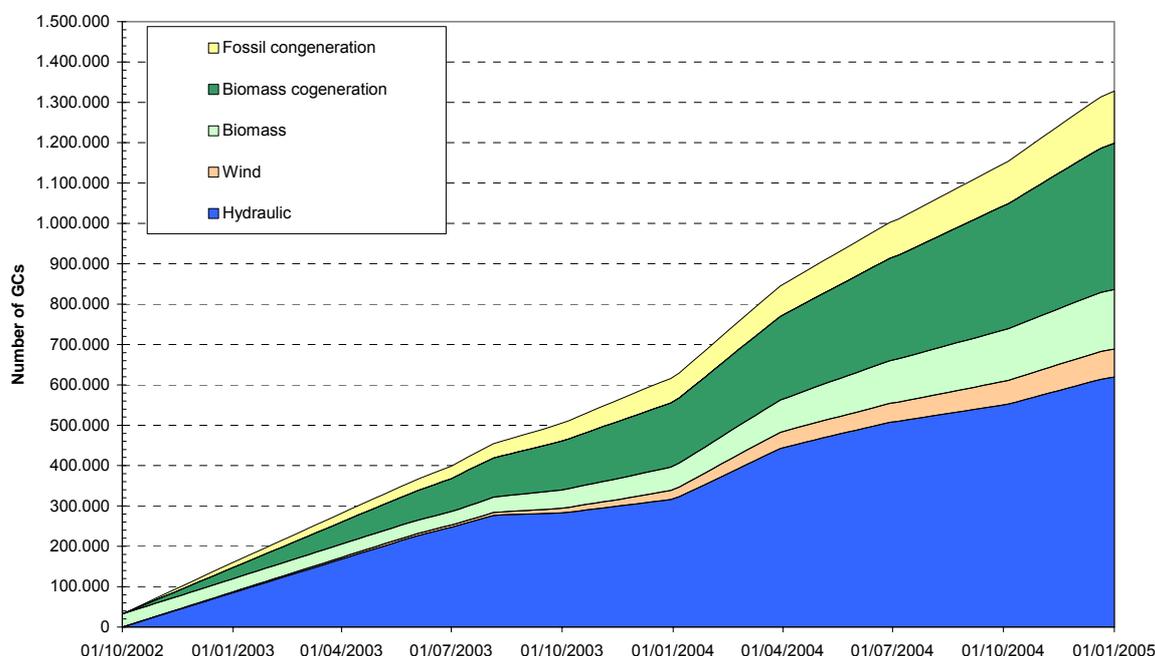
Moreover, CWaPE suspended the green certificate issuance process in the case of one site which did not meet requirements, against 5 sites in 2003.

### Green certificates issued:

The number of green certificates issued in 2004 was 715,030, against 613,342 in 2003, i.e. an increase of almost 17%. In 2004, green power generation accounted for approximately 3.7% of the power supply in the Walloon Region, against 3.2% in 2003.

Green certificates are not issued continuously during the year, but on the basis of quarterly statements supplied by the producer. This means that the generation periods covered by these statements do not necessarily coincide with the calendar quarters. Moreover, in the case of new sites, certificates may be issued for longer periods due to delays in the certification procedure. The distribution of certificate issuance by generation method and by quarter is supplied in Annex 2.

The following graph supplies an idea of the accumulated production of green certificates by smoothing issuances over the entire generation period covered by the corresponding statements:



The evolution of the distribution of the green certificates issued by generation method is described in the following table and illustrations.

Année	2003			2004			Increase in GCs issued
	Capacity (MW)	Generation (MWh)	Number of GCs issued	Capacity (MW)	Generation (MWh)	Number of GCs issued	
Photovoltaic	0	0	0	0	0	0	-
Hydraulic	101	315.903	315.903	104	302.993	302.993	-4%
Wind	22	13.914	13.914	23	51.339	51.339	269%
Biomass	14	58.560	58.416	16	90.833	90.405	55%
Biomass cogeneration	36	131.235	159.921	41	180.309	200.800	26%
Fossil cogeneration	122	232.110	65.188	123	246.545	69.493	7%
<b>Total</b>	<b>295</b>	<b>751.723</b>	<b>613.342</b>	<b>306</b>	<b>872.020</b>	<b>715.030</b>	<b>17%</b>

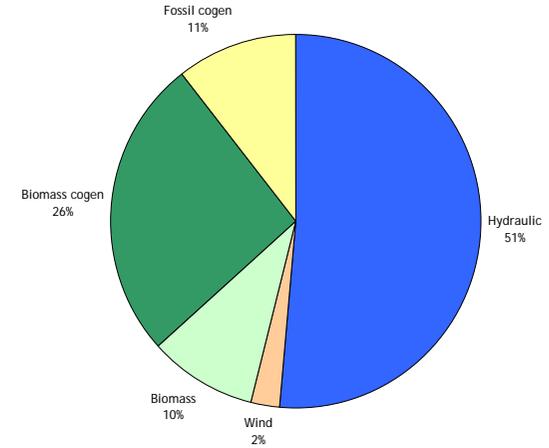
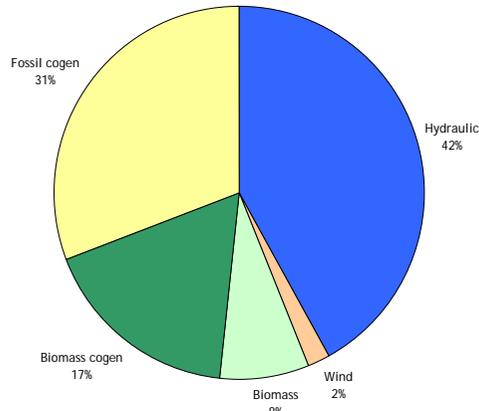
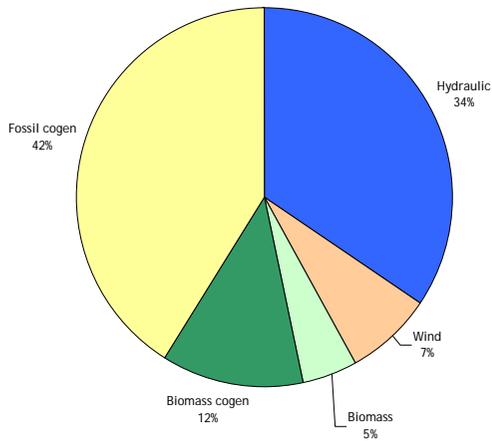
The average CO<sub>2</sub> saving rate ( $\tau$ ) of the green power generation facilities was 0.82 CV/MWhe, and was comparable to the rate observed in 2003.

### Green power generation facilities - 2003

Installed capacity: 295 MW

752,000 green MWh generated

Number of GCs issued: 613,000

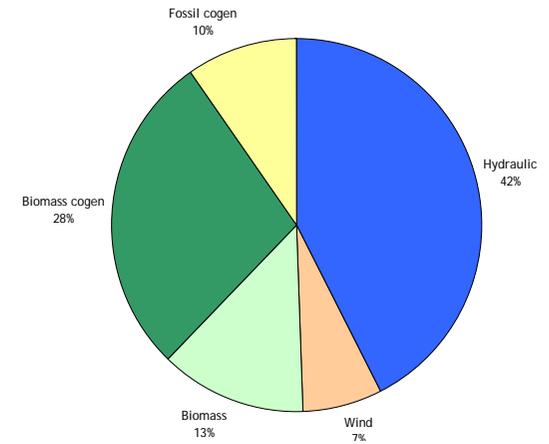
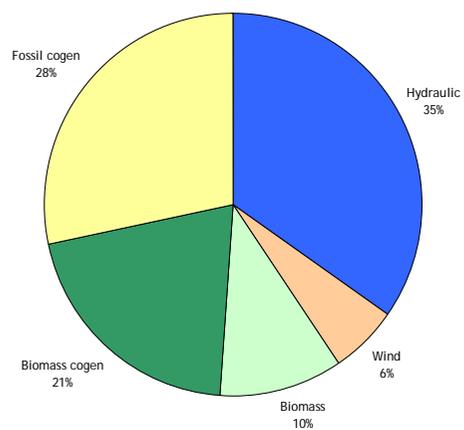
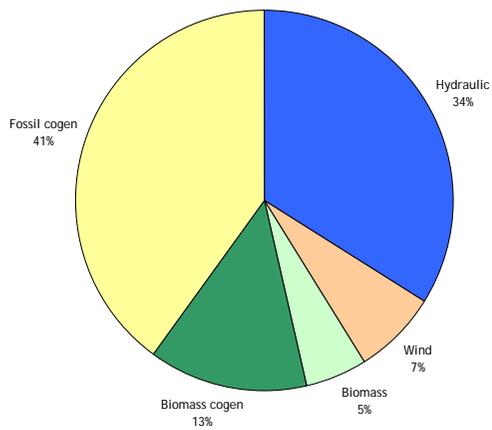


### Green power generation facilities - 2004

Installed capacity: 306 MW

872,000 green MWh generated

Number of GCs issued: 715,000



The evolution of the number of green certificates issued in 2004 compared with 2003 is not only explainable by the certification of new generation sites in 2004. Other factors affected the issuance of green certificates, in 2004, notably:

- A number of sites made their prior application for green certification in October 2002, and were therefore able to include green energy from that date. In practice, some sites were issued green certificates in 2003 for a period of 14 months.

In the case of hydraulic generation, however, this effect was partly compensated in 2003 by a sharp decrease in the power generated by these facilities due to the drought. In total, the number of green certificates issued in 2004 was slightly less than that for 2003, despite the certification of new sites.

- A number of sites certified at the end of 2003 only began to generate green certificates in 2004.

In the case of wind generation, the increase in the number of green certificates issued was proportionately much higher than the increase in capacity. This is unsurprising as most of the wind turbines extant in 2003 were installed at the end of 2003, and therefore operated for only a few months in 2003, against 12 months in 2004.

In the biomass sector, the CETEM site increased the capacity of its green power generation facilities by installing 6 new engines at the end of 2003. This led to an increase in the number of green certificates issued in 2004.

The same applies to the Aubel site (DETRY Frères, fuel oil cogeneration), which received green certificates in 2004 due to improvements to the facilities made at the beginning of 2004.

### **Results for 2004 compared with predictions made in 2003**

In 2003, it was predicted that almost 800,000 green certificates would be issued, whereas the number was, in fact, 715,000. This difference is mainly explained by the lower-than-average production of the hydraulic facilities and by delays affecting a number of projects, which will only be completed in 2005. For information purposes, 21 sites are currently being certified and should account for an additional total capacity of over 112 MW. 2004, therefore, has been a transition year between the certification of existing sites and the setting-up of new projects.

### 3.2. The green certificate market

#### Green certificate transactions:

326,733 GCs were traded in 2004<sup>14</sup>. The average unit price was approximately 92 €.

	<b>Number of GCs</b>	<b>Average unit price</b>
<b>2003: 1st half</b>	7669	87.63
<b>2003: 3rd quarter</b>	94,575	79.29
<b>2003: 4th quarter</b>	62,700	91.65
<b>2004: 1st quarter</b>	81,757	91.57
<b>2004: 2<sup>nd</sup> quarter</b>	71,380	91.68
<b>2004: 3rd quarter</b>	89,318	91.95
<b>2004: 4th quarter</b>	84,279	91.74
<b>Total</b>	<b>518,641</b>	<b>89</b>

	<b>Number of GCs</b>	<b>Average unit price</b>
<b>2003</b>	164,943	84.38
<b>2004</b>	326,733	91.74

These market prices, which have been published on the CWaPE website, apply to approximately 45% of the green certificates issued since the coming into force of the system.

The remaining green certificates (55%) are chiefly those issued to generation sites belonging to suppliers, which were used for their respective quotas or kept for use at a later date.

#### Green certificate quota returns:

The number of green certificates to be supplied to CWaPE as per the obligation imposed on suppliers and system operators by Article 21 of the Arrêté of 4 July 2002 on the promotion of green power was calculated on the basis of a "nominal" quota of 4%, and on the other hand on the basis of the quota reductions for supplies to heavy-use end customers.

Taking these reductions into account, the nominal quota of 4% for 2004 was reduced to an actual quota (ratio of the number of green certificates to be supplied and the number of MWh supplied) of 3.5%.

The number of green certificates supplied to CWaPE as per the obligation imposed on suppliers and system operators was 733,370 GCs for all of 2004, against 486,500 for 2003.

The number of green certificates which should have been supplied during that same period was 827,559. The difference, i.e. 94,189.057 certificates, led to the levying of a total of 9,418,906 euros in administrative fines.

<sup>14</sup> Quota returns are not considered to be transactions.

The 733,370 GCs supplied to CWaPE therefore represent 88.6% of the number of GCs which should have been supplied, whereas the stocks of GCs available on the market at the various times at which the GCs were to be supplied to CWaPE were respectively:

Quarter	Date of quota return	Stocks of green certificates available on the market(*)
1st quarter 2004	31 May 2004	158,128
2 <sup>nd</sup> quarter 2004	31 August 2004	171,539
3rd quarter 2004	30 November 2004	148,156
4th quarter 2004	28 February 2005	118,824

(\*): "stocks of green certificates" is the difference between the total number of green certificates issued and the total number of green certificates supplied to CWaPE on the quota return date.

The details of the green certificate quota returns are:

Number of suppliers obliged to supply statements in 2004 concerning the power supplied by them and a number of green certificates corresponding to the nominal quota of 4% to CWaPE:

- 10 suppliers with a general supply licence
- 4 suppliers with a green supply licence (\*\*).

(\*\*) Green supply licences are issued to suppliers supplying at least 50% of green power.

Number of system operators obliged to supply statements in 2004 concerning the power supplied by them and a number of green certificates corresponding to the quota of 4% to CWaPE: 13.

### **Impact of quota reductions:**

The quota reductions granted to suppliers of the operations centres of heavy-use end consumers amounted to 117,548 green certificates.

The saving made by the suppliers (to be passed on to the end customers) can be estimated as follows:

	Saving made: (in euros)
On the basis of the amount of the fine	11, 754,769
On the basis of the average price of 91.74 euros/GC on the green certificate market	10, 783,825

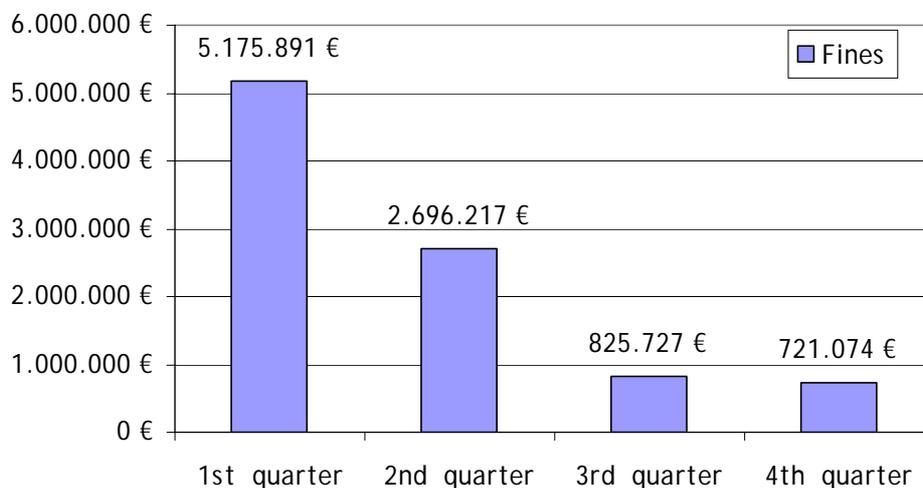
Quarterly green certificate quota returns

	Total sales during year (MWh)	GC reduction	GCs to be supplied	GCs supplied	Missing GCs	Admin. fine (in euros)
1st quarter 2004						
Suppliers	2, 851,387	30,668	83,388	83,388	0	0
System operators	3, 605,112	0	144,204	92,446	51,759	5,175,891
<b>TOTAL</b>	<b>6, 456,499</b>	<b>30,668</b>	<b>227,592</b>	<b>175,833</b>	<b>51,759</b>	<b>5,175,891</b>
2 <sup>nd</sup> quarter 2004						
Suppliers	2, 752,145	29,977	80,109	80,109	0	0
System operators	2, 863,126	0	114,525	87,563	26,962	2,696,217
<b>TOTAL</b>	<b>5, 615,271</b>	<b>29,977</b>	<b>194,634</b>	<b>167,672</b>	<b>26,962</b>	<b>2,696,217</b>
3rd quarter 2004						
Suppliers	3, 595,621	28,144	115,681	115,681	0	0
System operators	1, 762,321	0	70,461	62,203	8257	825,727
<b>TOTAL</b>	<b>5, 357,942</b>	<b>28,144</b>	<b>186,141</b>	<b>177,884</b>	<b>8257</b>	<b>825,727</b>
4th quarter 2004						
Suppliers	3, 801,526	28,759	123,302	123,302	0	0
System operators	2, 397,231	0	95,889	88,679	7211	721,074
<b>TOTAL</b>	<b>6, 198,758</b>	<b>28,759</b>	<b>219,192</b>	<b>211,981</b>	<b>7211</b>	<b>721,074</b>

TOTAL 2004						
	Total sales during year (MWh)	GC reduction	GCs to be supplied	GCs supplied	Missing GCs	Admin. fine (in euros)
Suppliers	13, 000,679	117,548	402,480	402,480	0	0
System operators	10, 627,790	0	425,079	330,890	94,189	9,418,909
<b>TOTAL</b>	<b>23, 628,470</b>	<b>117,548</b>	<b>827,559</b>	<b>733,370</b>	<b>94,189</b>	<b>9,418,909</b>

### **Evolution of the amount of the fines:**

The total amount of the fines paid in 2004 was almost 9.5 million euros (over 17 million in 2003). However, as shown below, this amount is shrinking. The amount of the fines for the fourth quarter was 721,000 euros.



It must be noted that all suppliers to eligible customers fulfilled all their obligations, and were therefore not fined.

Finally, during each quarter, there were enough green certificates on the market to meet the green certificate requirements for the quota return (see following illustration).

### **Supply and demand on the green certificate market**

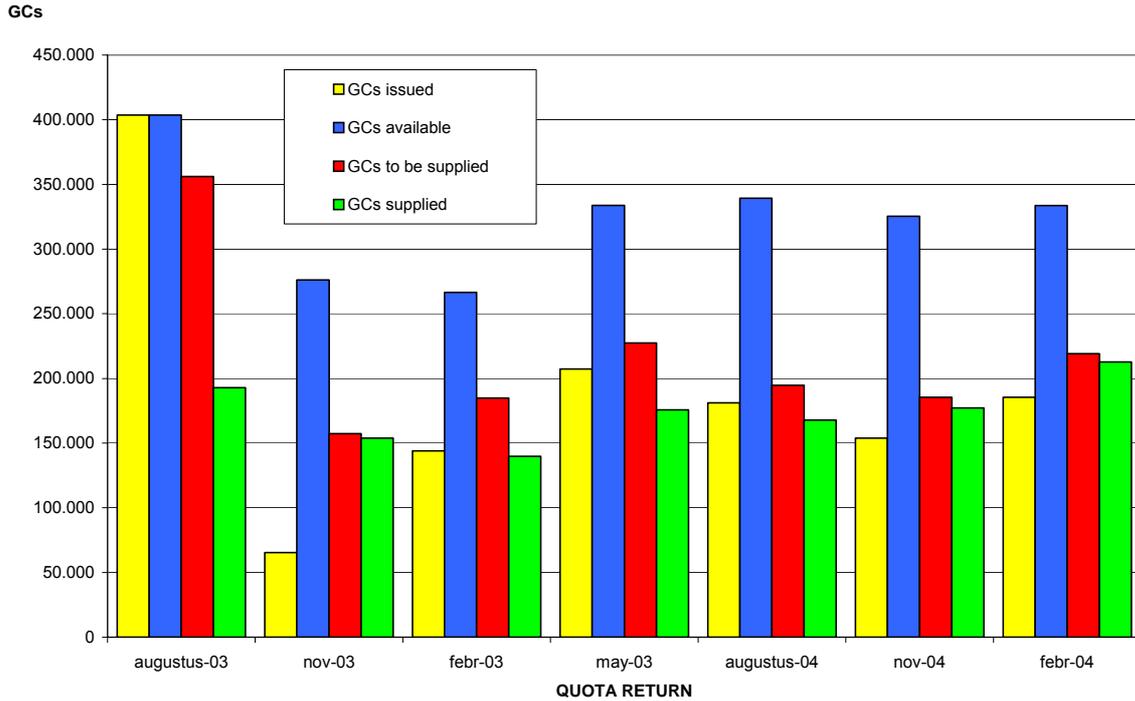
The following graph shows the GC market at the time of the quota returns. The first column shows the number of green certificates issued between two quota return dates.

The "GCs available" are the GCs available on the market at the time of the quota return, the sum of the green certificates issued during the period and the stocks of unused green certificates from the previous period.

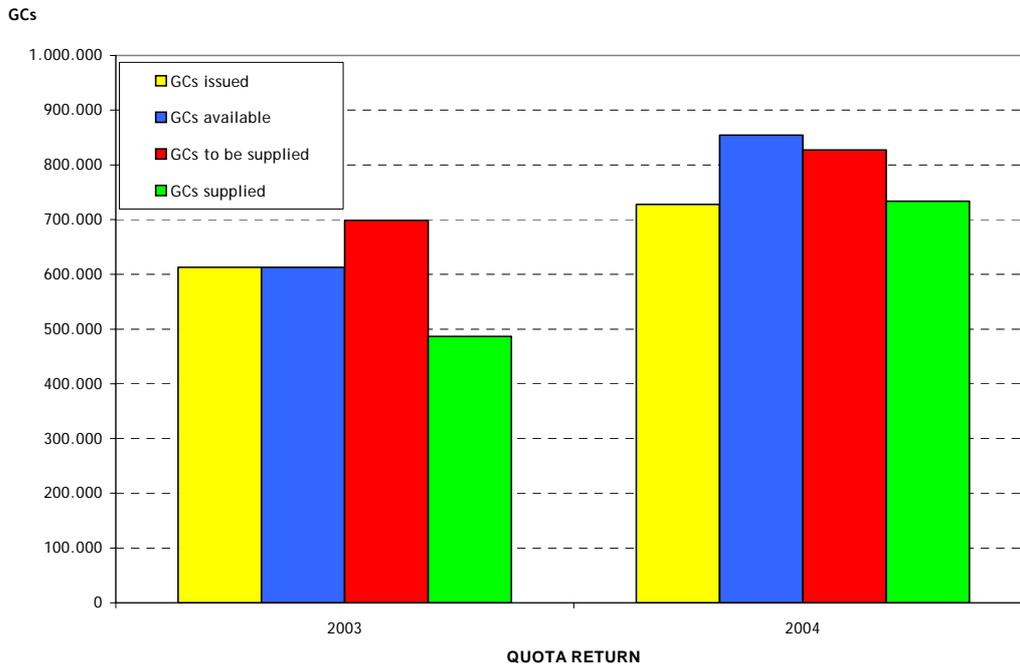
"GCs to be supplied" is the number of GCs to be supplied by the suppliers and system operators. This equals 4% of the total power supplied (3% in 2003), minus the reductions granted for heavy-use end customers.

Finally, "GCs supplied" is the actual number of certificates supplied for the quota. The difference between the GCs to be supplied and the GCs supplied is the variation in the green certificate stocks.

At the time of each quota return, the number of green certificates available was enough to cover the requirements. The number of certificates actually supplied is also gradually approaching the number to be supplied. As a result, the fines levied are decreasing.



The following graph supplies information concerning the green certificate market in 2003 and 2004.



In this graph, "GCs available" is the sum of the green certificates issued during the year and of the stock of unused GCs from the previous year.

Both in 2003 and 2004, the number of green certificates issued was lower than the number of green certificates to be supplied for the quotas. However, the number of green certificates available on the market in 2004 was higher than the number of certificates to be supplied for the quotas due to the stocks of green certificates accumulated in 2003.

#### 4. Prospects

##### 4.1. Evolution of the green power generation facilities

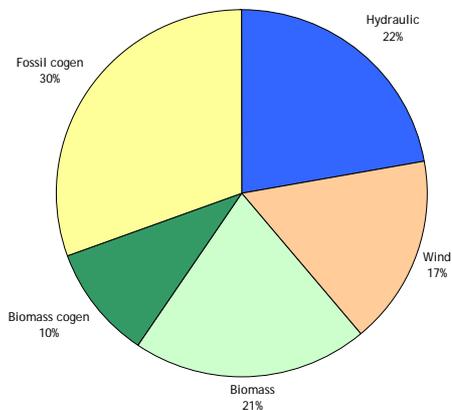
On the basis of the projects currently under way, the evolution of the green power facilities in 2005 can be forecast as follows:

2005 projects	Capacity (kWe)	GCs expected in 2005	Increase in No. of GCs compared with 2004
Hydraulic	500	500	0.17%
Wind	55,000	80,000	156%
Biomass	80,000	160,000	177%
Biomass cogeneration	5,000	12,000	6%
Fossil cogeneration	20,000	12,000	17%
TOTAL	160,500	264,500	37%

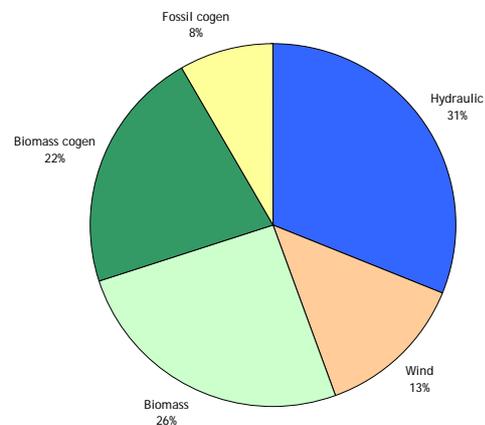
**Table 1 : Projects planned for 2005**

These projects include the conversion of a formerly coal-fired power station unit into a generation unit burning wood granules, the conversion to natural gas of several cogeneration units in the sugar sector, the commissioning of several wood-fired (gasifier or boiler), (vegetable or animal) oil-fired and biodiesel-fired cogeneration units. In the wind sector, 80% of the wind farms authorised to date are due to be completed in 2005.

Installed capacity: 465 MW



Number of GCs issued: 975,000

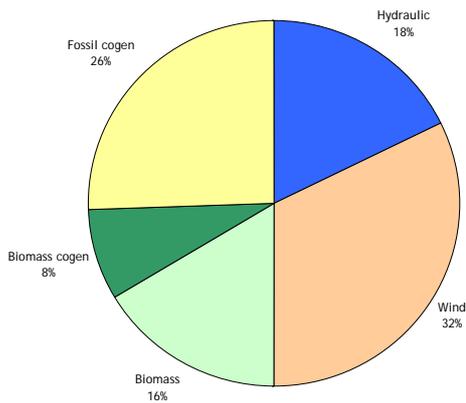


**Forecast for 2005**

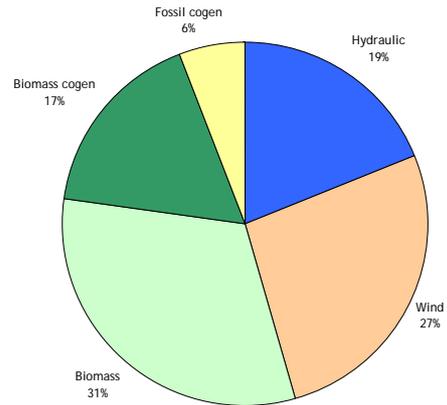
2003 was mainly dedicated to starting up the green certificate system on the basis of existing facilities, and 2004 to the preparation of investment projects and the commissioning of the most advanced of these. In 2005, it should be possible to reap the first benefits of the existing aid system. Compared with 2003, the installed green power capacity should have increased by 55% and the number of green certificates by 60%.

On the basis of the projects currently being prepared, the evolution of the green power generation facilities by 2007 can also be estimated:

Installed capacity: 600 MW



Number of GCs issued: 1,600,000



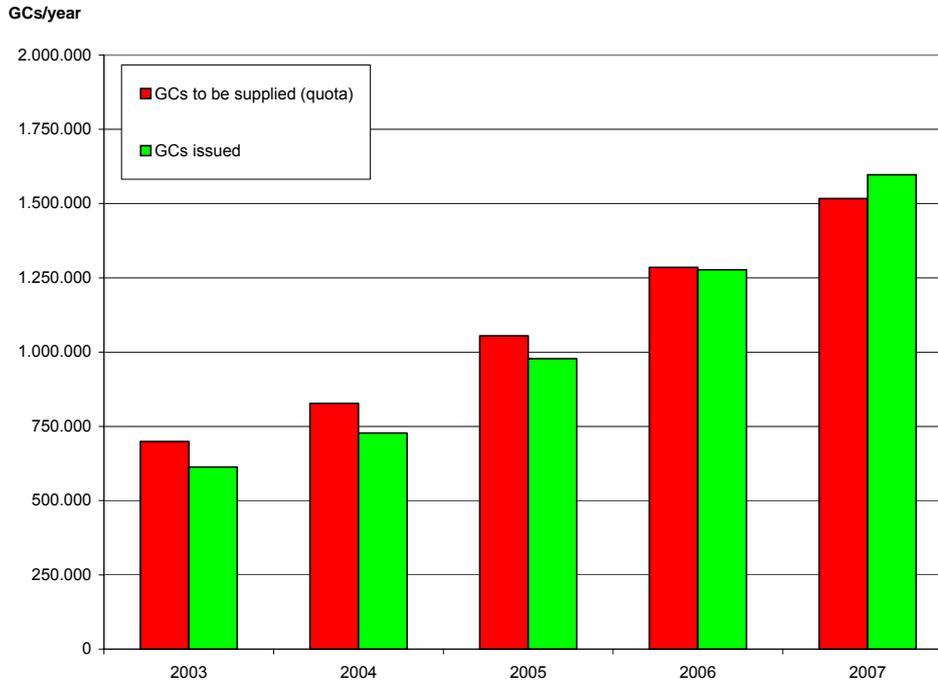
### Forecast for 2007

On the basis of these forecasts, it is possible to assume that in 5 years the Walloon Region's green power generation capacity will have doubled, from slightly less than 300 MW in 2003 to approximately 600 MW in 2007.

In the medium term, the new projects in preparation should lead to a substantial alteration of the distribution between green power generation methods. The gradual commissioning of wind farms authorised or under consideration, the commissioning of several biomass cogeneration units (wood, biogas, vegetable and animal oils, etc.) as well as a small number of fossil-fuel cogeneration units in industry should cause the percentage of green certificates issued to hydraulic facilities to decline from slightly over 40% in 2004 to approximately 20% in 2007. The issuance of green certificates will therefore become less sensitive to drought problems such as those observed in 2003.

## 4.2. The evolution of the green certificate market

On the basis of the previous green power generation facilities, taking into account the imposed quotas and allowable quota reductions, and assuming that electricity supplies will increase by 1% per year (increase observed in 2004), the evolution of green certificate supply and demand can be simulated for the next three years.



**Evolution of supply and demand on the GC market**

Hence, a balance should be struck between green certificate supply and demand until 2007.

On the basis of these forecasts, the increase of the number of green certificates to be supplied for the current quotas (taking into account the allowable quota reductions) should be approximately 225,000 GCs/year. This increase appears to be consistent with the observations and forecasts relating to the development of green power generation facilities until 2007.

However, the implementation of the new projects depends on investors retaining their confidence in the supporting mechanism. In turn, this confidence depends on the stability of the rules regulating the system, and on development prospects enabling quotas to be set over a period of time consistent with the write-down times for the planned investments.

## ANNEX 1: List of green power generation facilities at the end of 2004

Technologies	Producers	Generation sites	Pend (kW)	
Photovoltaic	DAVENNE J-P.	088 PHOTOVOLTAIQUE SOLWASTER	1	
	QUITTRE Laurent	095 PHOTOVOLTAIQUE ISSOL	1	
Pend (KW) - Photovoltaic			2	
Number of sites			2	
Biomass	ELECTRABEL	084 C.E.T. DE MONTZEN	409	
	I.D.E.Lux	063 DECHARGE DE TENNEVILLE	693	
	IDEA HENNUYERE	068 STATION D'EPURATION DE WASMUEL	429	
	INTRADEL	082 C.E.T. D'HALLEMBAYE	2.048	
	ITRADEC	027 SITE DE HAVRE	1.623	
	PAGE	002 CETEM	9.023	
	SITA WALLONIE	001 CET D'ENGIS PAVIOMONT	1.780	
	VERDESIS	090 ASSOCIATION INTERCOMMUNALE DE VALORISATION DE L'EAU	26	
	WALPOWER	092 CET d'IDELUX	319	
Pend (KW) - Biomass			16.350	
Number of sites			9	
Fossil cogeneration	DETRY FRERES	042 AJUBEL	798	
	ELECTRABEL	004 CHR DE NAMUR	813	
		005 IRE (Institut national des élmnts radioactifs)	1.024	
		006 LABO THISSEN	338	
		007 MINERVE	765	
		008 SWEDEPONIC WALLONIE	341	
		009 VESALE	1.331	
		025 CENTRALE DE BRESSOUX	2.734	
		039 SOLVAY	94.556	
		ENERCO GLOBAL	044 NOVOTEL DE NAMUR	122
		045 MOTEL DE NIVELLES	65	
		037 RAFFINERIE TIRLEMONTAISE WANZE	9.949	
		011 SUCRERIE DE WANZE	529	
	003 UCL	9.255		
Pend (KW) - Fossil cogeneration			122.621	
Number of sites			14	
Cogeneration + biomass	BIFFA TREATMENT	020 COUR-AU-BOIS	3.041	
	BURGO ARDENNES	043 BURGO ARDENNE (VIRTON)	29.801	
	ELECTRABEL	010 LUTOSA	2.245	
	HECK	023 HOF HECK	41	
	ISERA & SCALDIS SUGAR	098 SUCRERIE DE FONTENOY	5.580	
	KESSLER FRERES	038 FERME DE FAASCHT	145	
	LENGES	024 LENGES	140	
	SPAQUE	064 DECHARGE D'ANTON	293	
Pend (KW) - Cogeneration + Biomass			41.286	
Number of sites			8	
Wind	ELECTRABEL	070 PARC EOLIEN DE BUTGENBACH	7.993	
	LES VENTS DE L'ORNOI	086 EOLIENNES DE GEMBLoux SOMBREFFE	5.995	
	LES VENTS D'HOUYET	094 EOLIENNE AUX TCHERETTES	607	
	MICHAUX Jean-Pierre	091 EOLIENNE DU CHAMP DE RANCE	25	
	P.B.E.	069 EOLIENNE DE PERWEZ	597	
	RENEWABLE POWER COMPANY	050 EOLIENNES DE SAINTE ODE	7.484	
Pend (KW) - Wind			22.701	
Number of sites			6	
Hydraulic	CENTRALE ELECTRIQUE LA FENDERIE	071 CENTRALE HE LA FENDERIE	276	
	CENTRALES GAMBY	059 CENTRALE HE CHAPIUS	100	
		060 CENTRALE HE D'OLNE	256	
	DONY	048 MICRO CENTRALE HE DU VAL DE POIX	94	
	ELECTRABEL	028 CENTRALE HE DE LORCE	51	
		029 CENTRALE HE HEID DE GOREUX	7.344	
		030 CENTRALE HE DE ORVAL	47	
		031 CENTRALE HE DE COO DERIVATION	385	
		032 CENTRALE HE DE STAVELOT	106	
		033 CENTRALE HE DE CIERREUX	100	
		034 CENTRALE HE DE LA VIERRE	1.976	
		035 CENTRALE HE DE BUTGENBACH	2.106	
		036 CENTRALE HE DE BEVERCE	9.902	
		ENHYDRO	065 CENTRALE HE DE PONT-A-SMUID	174
			066 CENTRALE HE DE SAINTE-ADELINE	116
		HYDROLEC DENIS	051 CENTRALE HE DE DOLHAIN	80
			052 CENTRALE HE DES FORGES	66
		053 CENTRALE HE DU MOULIN PIRARD	49	
	HYDROVAL	047 CENTRALE HE ZOUDE	178	
	JEANTY Nadine	076 CENTRALE HE MOULIN DE VILLERS-LA-LOUE	15	
	MARAITE Bruno	061 CENTRALE HE MARAITE (LIGNEUVILLE)	217	
	MERYTHERM	057 CENTRALE HE DE MERY	129	
		058 CENTRALE HE DE RABORIVE	60	
	MET - I.G. 45	078 CENTRALE HE DE L'EAU D'HEURE	951	
	MOULIN FISENNE	073 CENTRALE HE MOULIN FISENNE	95	
	MUYLE HYDROELECTRICITE	087 CENTRALE HE DE MORNIMONT	659	
	PIRONT Alphonse	074 CENTRALE HE PIRONT (LIGNEUVILLE)	62	
		075 CENTRALE HE MOULIN MAYERES	119	
	PROTIN Josette	056 CENTRALE HE MOULIN D'EN BAS	15	
	REFAT ELECTRIC	067 CENTRALE HE DE STAVELOT	245	
	S.P.E. - Licence générale électricité	012 CENTRALE HE DE FLORIFFOUX	843	
		013 CENTRALE HE DES GRANDS MALADES	4.887	
		014 CENTRALE HE D'ANDENNE	8.986	
		015 CENTRALE HE D'AMPSIN NEUVILLE	9.911	
		016 CENTRALE HE D'IVOZ RAMET	9.742	
		017 CENTRALE HE DE MONSIN	17.769	
		018 CENTRALE HE DE LIXHE	22.979	
	SAPIEF	072 CENTRALE HE DE FRAIPONT	60	
	SCIERIE MAHY	083 CENTRALE HE MAHY	25	
	SOCIETE WALLONNE DES EAUX	054 COMPLEXE DE L'OURTHE	616	
		055 COMPLEXE DE LA VESDRE	1.519	
	WILLOT Jean-Luc	099 CENTRALE HE MOULIN DE JEHOULET	22	
	ZEYEN	062 CENTRALE HE MOULIN DE WEWELER	169	
	Pend (KW) - Hydraulic			103.503
	Number of sites			43
	TOTAL Pend (KW)			306.463
	TOTAL Number of sites			82

**ANNEX 2: issuance of green certificates in 2004 - Distribution by sector and by quarter**

		<b>TOTAL</b>	<b>2003</b>	<b>2004</b>	<b>1st quarter 2004</b>	<b>2nd quarter 2004</b>	<b>3rd quarter 2004</b>	<b>4th quarter 2004</b>
<b>OVERALL</b>	<b>GCs issued</b>	<b>1, 340,987</b>	<i>613,342</i>	<i>715,030</i>	207,254	151,391	139,923	216,462
	<b>Metric tons of CO<sub>2</sub> prevented</b>	<b>611,490</b>	<i>279,684</i>	<i>326,054</i>	94,508	69,034	63,805	98,707
	<b>Green power generated (MWh)</b>	<b>1, 635,890</b>	<i>751,723</i>	<i>872,020</i>	218,356	179,697	171,431	302,536
	<b>Total power sales in RW</b>		<i>23, 368,935</i>	<i>23, 628,470</i>				
	<b>% of green power</b>		<i>3,22</i>	<i>3,69</i>				
<b>Hydraulic</b>	<b>GCs issued</b>	<b>622,060</b>	<i>315,903</i>	<i>302,993</i>	122,554	67,667	41,784	70,988
	<b>Green power generated (MWh)</b>	<b>622,060</b>	<i>315,903</i>	<i>302,993</i>	122,554	67,667	41,784	70,988
<b>Wind</b>	<b>GCs issued</b>	<b>69,679</b>	<i>13,914</i>	<i>51,339</i>	19,439	10,059	9,266	12,576
	<b>Green power generated (MWh)</b>	<b>69,679</b>	<i>13,914</i>	<i>51,339</i>	19,439	10,059	9,266	12,576
<b>Biomass</b>	<b>GCs issued</b>	<b>148,830</b>	<i>58,416</i>	<i>90,405</i>	18,907	13,323	21,418	36,757
	<b>Green power generated (MWh)</b>	<b>149,402</b>	<i>58,560</i>	<i>90,833</i>	19,007	13,420	21,493	36,913
<b>Biomass cogeneration</b>	<b>GCs issued</b>	<b>365,736</b>	<i>159,921</i>	<i>200,800</i>	42,363	48,104	54,649	55,684
	<b>Green power generated (MWh)</b>	<b>316,092</b>	<i>131,235</i>	<i>180,309</i>	33,213	39,750	56,259	51,087
<b>Fossil cogeneration</b>	<b>GCs issued</b>	<b>134,681</b>	<i>65,188</i>	<i>69,493</i>	3,991	12,238	12,807	40,457
	<b>Green power generated (MWh)</b>	<b>478,655</b>	<i>232,110</i>	<i>246,545</i>	24,144	48,801	42,629	130,972