

# The Certification Approach of The Netherlands

## Encouraging Fuel-saving Generation Technology

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The bureau of EnergieNed, the association of energy companies in The Netherlands, has developed a scheme in which fuel saving generation technology is encouraged. This scheme is for further discussion and could serve as an example for a solution in the long term for encouragement of fuel saving in the energy industry.

### Zusammenfassung des Berichts

### Ein Ansatz für den Zertifikathandel in den Niederlanden

Brennstoffeinsparungen bei der Erzeugung von Strom und Wärme mit fossilen Brennstoffen ist unter den heutigen wirtschaftlichen Bedingungen nur zu einem sehr geringen Prozentsatz verwirklicht. Das technische und wirtschaftliche Potenzial für weitere Verbesserungen ist sehr groß. Selbst in Zukunft sind mit Kraft-Wärme-Kopplung weitere Einsparungen von 20 bis 30 % zu erreichen. Aber auch Verbesserungen bei der getrennten Erzeugung können zu Einsparungen führen. EnergieNed, die Vereinigung der niederländischen Energieversorger, schlägt ein Programm vor, das die Entwicklung brennstoffsparender Erzeugungstechnik fördern soll. Dieses Programm kann als Muster für langfristige Energieeinsparung in der Energiewirtschaft dienen.

Das Förderprogramm soll die Brennstoffeinsparung in existierenden und neuen Stromerzeugungsanlagen fördern, d. h. die effiziente Umwandlung von Brennstoff in Strom und Wärme. Dabei muss das Förderprogramm die

Brennstoffeinsparung sowohl bei kombinierter Erzeugung von Strom und Wärme als auch bei getrennter Erzeugung fördern, sodass die gleiche Förderprämie je eingesparter Energieeinheit erreicht wird.

Ein Förderprogramm, das brennstoffsparende Techniken und Anwendungen belohnt, muss direkt an die tatsächliche Einsparung von Brennstoff gebunden sein. Um diese Einsparung festzulegen, wird ein Maßstab benötigt. Als Maßstab für die Stromerzeugung können die besten erdgasbefeuerten Kraftwerke dienen und die besten Erdgaskessel als Referenz für die Wärmeerzeugung. Weiter schlägt EnergieNed vor, den Produzenten eine (teilweise) Befreiung von der Ökosteuer zu gewähren, die zur Erzeugung brennstoffsparender Techniken nutzen. Hierzu sollen die Produzenten eine gewisse Anzahl von Zertifikaten mit ihrem Stromprodukt zur Verfügung stellen. Die Zahl der Zertifikate ist direkt an die Brennstoffeinsparung gebunden, die mit der erzeugten und gelieferten Strommenge erreicht wurde. Steigt die eingesparte Brennstoffmenge, können auch mehr Zertifikate in Umlauf gebracht werden. Jedes Zertifikat berechtigt zu einer bestimmten Befreiung von der Ökosteuer oder zu einer entsprechenden Rückzahlung.

Als nächster Schritt wird die schnellstmögliche Einführung eines europäischen Systems handelbarer CO<sub>2</sub>-Emissions-Zertifikate vorgeschlagen. Dieser Emissionshandel soll vom Energiemarkt selbst organisiert werden. Hierbei muss die Brennstoffeinsparung durch Kraft-Wärme-Kopplung oder separate Erzeugung mit einheitlichen Berechnungsmethoden zur erreichten CO<sub>2</sub>-Einsparung verbunden sein.

Fuel saving when generating electricity and heat with fossil fuels is only getting off the ground to a very modest degree in the present economic conditions. The technical and market potential of further development to save fuel is still great. Even in the future with good combined heat and power installations a saving of around 20 to 30 % can be achieved. Improvements in separate electricity generation can also give fuel savings. EnergieNed has developed a scheme in which fuel saving generation technology is encouraged, for further discussion. This scheme could serve as an example for a solution in the long term for encouragement of fuel saving in the energy industry.

### The Incentive Scheme

The incentive scheme aims to encourage fuel saving in existing and new electricity production facilities. That means that efficient conversion of fuels into electricity and into heat is being encouraged. Incentive schemes must be of such a nature that they encourage both CHP (combined heat and power) and fuel-saving separate generation technology and such that the same incentive is given per saved unit of fuel. Incentive schemes that reward fuel-saving technology and applications must be directly related to the real fuel savings achieved. When determining these the

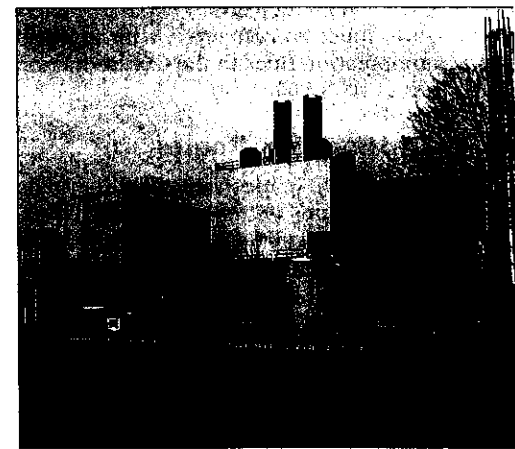


Figure 1. Fuel saving when generating electricity and heat with fossil fuels is only getting off the ground to a very modest degree in the present economic conditions

Bild 1. Brennstoffeinsparungen bei der Erzeugung von Strom und Wärme mit fossilen Brennstoffen ist unter den heutigen wirtschaftlichen Bedingungen nur zu einem sehr geringen Prozentsatz verwirklicht



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fuel savings performance of the top segment of gas-fired electricity power station in operation and the top segment of gas boiler in operation can be taken as references. It is proposed to grant producers who generated fuel-saving technology a (partial) exemption from the ecotax. To carry this out producers who use fuel-saving generation technology supply a quantity of stamped certificates with the electricity product. The number of certificates must relate directly to the amount of fuel saving made with the quantity of power generated and supplied. As more fuel is saved more certificates can be put into circulation. Each certificate gives the right to exemption of ecotax on electricity, or can receive an amount of money related to the ecotax on the product electricity. The more certificates are supplied the bigger the ecotax exemption. Because of the right to ecotax exemption coupled with the certificates the certificates represent a certain financial value, which benefits the owner of the fuel-saving generator. As a second step it is proposed to prepare a European wide system of negotiable CO<sub>2</sub> reduction certificates as soon as possible. This will create an incentive, irrespective of the method with which the saving is made. Such a certificate could have a value that is equal to the social economic value of the CO<sub>2</sub> reduction. The market itself organises this certificate trade. The fuel saving by CHP and by fuel-saving separate generation must be converted with uniform computation rules to the CO<sub>2</sub> reduction effect achieved.

### Two Separate Routes

The trade in electricity and the trade in certificates are two different routes. Once issued and marketed the certificates find their own way to the final consumer. The certificates can also be traded on the certificate market first, before they reach the final consumer of electricity. Of course on the consumption side more certificates can never be sold than are put into circulation.

### How the Certificates Reach the Market

The issue of certificates is in principle the same as those for renewable energy. The only difference is that certificates are not issued for all the electricity supplied, but only for a part of the power, in proportion to the fuel saving achieved.

Step 1: Certification of energy-saving current is based on a clear definition of what is combined heat and power current and what is fuel-saving separate generation. This is established in a definition document. Once every four years, starting at the end of 2001, the specific fuel consumption of the best separate electricity generators in Europe is established. This fuel consumption is expressed in GJ of fuel per kWh of electricity. In the same way the fuel consumption of the best separate heat generators is also established. This fuel consumption is expressed in GJ of fuel per GJ of heat. The performances are measured with calibrated fuel and energy meters and are annual averages.

Step 2: For each generator the degree is established to which fuels are saved with respect to the references. Differences in transport and distribution losses are also rediscounted where necessary. For a separate generator that has made a fuel-saving investment the degree to which less fuel per kWh is consumed than the above-mentioned best separate reference electricity generator is determined. This is also determined for a combined heat and power plant. In addition use is made of the fact that in addition to electricity heat is also produced. The fuels saved by the reference heat boiler can be deducted from the fuel consumption of the heat and power plant. The difference in their transport and distribution losses is also rediscounted. The fuel consumption of the fuel-saving generator is expressed as a percentage of the fuel consumption of the best alternative of separate generation and rounded to whole percents.

Step 3: Then determine the number of certificates that the owner of the generator may deliver. Owners of generators who already receive an exemption from ecotax under another scheme must first deduct the proceeds. That means that in these cases proportionately fewer certificates may be supplied. Table 1 indicates how many certificates should be supplied as a result of fuel-saving generation.

Step 4: Issue of the stamped certificates by an in-

dependent body to the owner of the generator. This independent body will have to ensure that this procedure is properly applied and that the rules are actually complied with. This body acts as a support committee and stamps the certificates before they are issued.

### How the Certificates Can Be Used in the Market

Each certificate gives a right to exemption from ecotax on electricity. Where electricity is taken from the grid and supplied to the final consumer this may be done with the qualification »fuel-saving power«, on the condition that this supply is combined with the supply or redeeming of certificates. This qualification and that supply are indicated on the energy bill. The energy consumer must make a conscious choice to want this form of supply or generation. The quantity of electricity exempted from ecotax is derived from the number of certificates. The value must be expressed in kWh (or a multiple of these). If the certificate is used as ecotax certificate the certificate is sent by the company supplying to the tax authorities who redeems it. An electricity supplier may sell his power as fuel-saving power until the volume of the certificates in his possession is exhausted. He may also use these certificates for the sale of renewable power. However then it is not enough for him to buy 1 renewable energy certificate for 1 kWh of electricity supplied, but he must, with an average fuel saving of 20 % on the purchase side, acquire 5 fuel-saving power certificates instead. As the certificate, once marketed, cannot be distinguished from the certificate also applicable for renew-

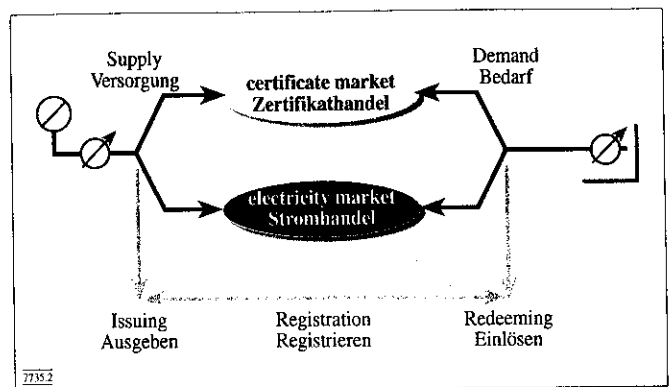


Figure 2. The trade in electricity and the trade in certificates are two different routes

Bild 2. Der Stromhandel und der Zertifikathandel laufen über zwei verschiedene Wege

**Table 1.** Number of certificates supplied as a result of fuel-saving generation

**Tafel 1.** Ausgegebene Zertifikate für brennstoffsparende Stromerzeugung

Fuel saving	Number of part-certificates per portion of 10,000 supplied kWhs
up to 5%	0 to 500
from 6 to 10%	600 to 1,000
from 11 to 15%	1,100 to 1,500
from 16 to 20%	1,600 to 2,000
from 21 to 25%	2,100 to 2,500
from 26 to 30%	2,600 to 3,000
from 31 to 35%	3,100 to 3,500

able energy (only the number of certificates per generator is lower) the value per certificate depends on the level of the ecotax tariff. At the start of this system the value per certificate will be determined uniformly. Ultimately the value is related to the final agreements regarding renewable power. Once the certificate trade has got properly under way the price can be established as a result of supply of and demand for certificates. The government will want to monitor this market. Via legislation the value of the certificates can be paid out to the owner of the fuel-saving generator.

### Conditions for Eligibility for Certificates

During production all the energy streams (incoming fuel, electricity and heat produced and supplied) must actually be metered with calibrated meters and averaged over the whole business year. The energy balance may not include the heat delivered by heat only boilers.

When determining the level of fuel saving the best gas-fired power station and the best gas boiler are used as a reference. These reference values must also be based on actually measured performances. If these reference performances are improved after four years the fuel saving to be rewarded (the number of certificates that one can obtain and may then supply with the electricity product) is also adjusted. Once decided for a certain power plant the right to emit certificates last for ten years at a maximum and at a minimum.

The producer must actually put the power generated into economic circulation. That means that certificates can only be supplied when the power is marketed via a public grid manager and a supplier. If the power is not marketed

certificates can also be acquired, only then the financial value may not be higher than in comparable situations where the power is put on the grid.

The features and advantages of this method are

- that the prices for the electricity product upon delivery to final consumers are not distorted (the certificate has its own value)
- every combined heat and power producer or owner of a fuel-saving separate generation plant receives the right to supply certificates if he complies with the conditions. These certificates are issued on application by an independent body, and it must be demonstrated that the fuel saving has been achieved
- the proposal is open to market forces: a competitive market for fuel saving will arise
- the incentive is »strong«, you are not just eligible for an incentive as a matter of course
- the term is limited because the technical opportunities to achieve fuel saving will be reduced over time as a result of technological developments which means the references will move
- the system of certificates or labels is simple, it is already used for renewable energy, it is easy to explain and it is recognisable in the market: it follows the certificate system for renewable energy
- the certificates can be made transferable to other suppliers
- the scheme links with the idea of greening the tax system
- an incentive is given for fossil fuel saving with the same approach as fully renewable energy, though (rightly) not for 100 %, but for only a few tens of percent in proportion to the fuel saving achieved it links with the certificate system for renewably generated electricity. Experience has already been acquired with this the proposal offers the opportunity of offering a separate product
- the proposal offers the opportunity of offering a separate product
- the proposal reinforces the environmentally-friendly image of the sector
- the short term proposal does not stand in the way of the trade in CO<sub>2</sub> certificates in the longer term, the short term proposal provides experience for the long term solution
- the administrative work is kept to a minimum (the customer does not have to collect and maintain the certificates himself), so no unnecessary red tape.

### Reference Efficiencies

Determination of the reference efficiencies that will be used in the system for the certification of fuel-saving technology:

#### A) The electric reference efficiency

The reference efficiency for electricity links up with the system for determining the top of the market. The electricity reference efficiency that will be used in the method to promote fuel-saving generation could be the electric benchmark efficiency met by the best of all units, in solo electricity operation.

### How the Proposal Is Worked Out

An explanation is given of how this proposal is worked out for four different situations, when, by means of an example, the reference efficiency for electricity production is set at 54 % and the reference efficiency for heat production is set at 90 %:

#### Example 1

If fuel saving is achieved for separate electricity generation then an owner of a power station that generates an annual average with an efficiency of 58 % with respect to the reference will save  $58/54 \times 100 = 7\%$  fuel and can thus supply 700 certificates per 10,000 kWh.

#### Example 2

If a power station generates electricity with an efficiency of less than the reference then he cannot supply any certificates.

#### Example 3

Say a local CHP plant operates with an annual average electricity efficiency of 38 % and a heat efficiency of 26 % (half heat utilisation). Then 3 % fuel is saved. Then it can supply 300 certificates. If all its heat is used (the heat efficiency then increases to 52 %) it saves 24 % fuel and it may then supply 2,400 certificates per 10,000 kWh.

#### Example 4

If the combined heat and power plant in example 3 functions with an annual average heat efficiency of less than 24 % then this generator does not save any fuel with respect to the references and no certificates may be supplied.

This can be done by using a framework of an electricity producers in a »Benchmarking Energy Efficiency« system. These efficiencies must be corrected for average operating conditions on an annual basis. The top includes in particular the modern units often running with a basic load. The medium load, peak load and standby-units mainly relate to older units with a lower efficiency that falls outside the top. The efficiencies are defined as the calorific value of the fuel and they are net efficiencies (the own consumption within the production site is then already rediscounted). Every four years the above series of figures is recalibrated, and will be applied for new investments. When a power station has the right to issue certificates, this right will last for ten years. The difference in the installation efficiency and the benchmark efficiency will over the years become less due to continuing technological developments. The course of this difference and the time at which a plant (possibly) no longer belongs to the top can be predicted fairly early on. The four-yearly recalibration of the benchmark efficien-

cies will it is anticipated only give rise to slight adjustments, applicable when new decisions of investments for a new power plant have to be made.

Advantages of these electric reference-efficiencies are:

1. The reference is deduced from an independent criterion that is not established by the interested parties themselves but by an international benchmark.
2. The electric reference takes developments over time into account.
3. The efficiency development is followed the international market to promote an internationally level playing field.
4. The development of the reference efficiency is »predicted« for a long period in advance. Investors then know what to expect and can make their decisions accordingly.
5. It respects investments in the past, for also existing power plants which are better than the reference may issue certificates.
6. It forms an incentive for heat supply from existing units, irrespective of the fuel type.

#### *B) The heat reference efficiency*

The reference efficiency for heat is in principle determined by avoiding the use of fuel to produce it: 70 to 90 %. The fuel saved for the avoided heat boiler may be deducted from the fuel consumption of the electricity-producing unit when it produces the heat. If the heat has to be transported over a certain distance to the energy consumer, a correction is made for distribution losses of heat, of 15 % of the heat produced where transport and distribution is involved and 10 % of the heat produced where only distribution of heat is involved. In addition a further correction is made for the electricity that is needed for the pump energy for driving the distribution pumps. This amounts 2.5 kWh per GJ of heat production in case of transport and distribution and 1.5 kWh per GJ of heat production just in case of heat distribution.