



Minimum price system compared with the quota model –effectiveness and efficiency

Which compensation model can best promote electricity generation from renewable energies? Currently, in a comparison in Europe¹ minimum price systems are being applied to a large extent. These systems are often contrasted with the quota model as a supposedly more efficient promotion instrument. In the European comparison minimum price systems, compared to quota schemes, up until now clearly perform better in terms of installed capacity, newly installed wind turbines and current average compensation rate of wind power. They are not only more effective but also more efficient.

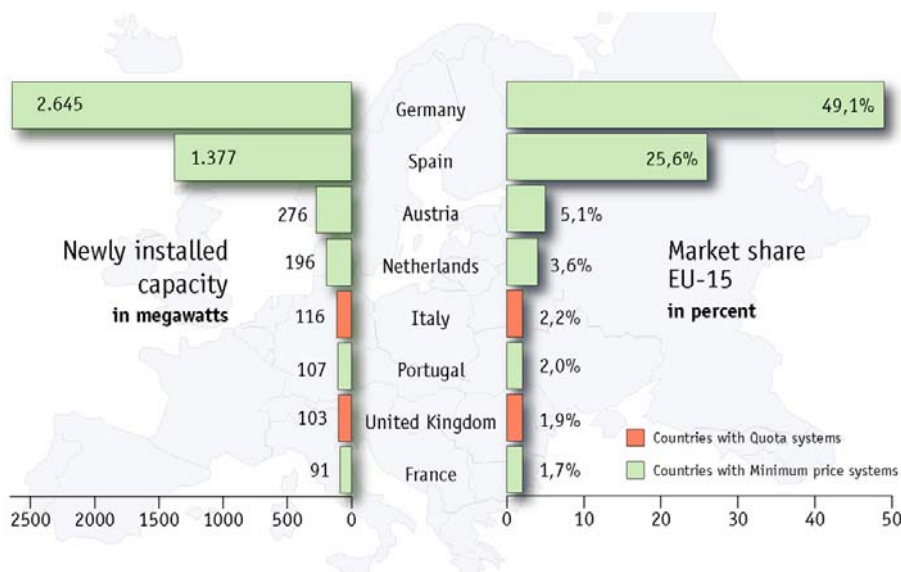
The minimum price system is characterized by the legally determined minimum price and a general duty to purchase “green” electricity on the part of the grid operator or utility. In contrast, the key component of a quota scheme is the government regulation of a quantity or amount of electricity from renewable energies that should be provided, purchased or sold by a specified group of market participants. Allocating certificates controls compliance to the respective committed quantity. Bidding models also exist: regenerative electricity producers compete in individual bidding rounds to cover a previously determined quantity contingent. The winning bidders then receive a fixed-term purchase guarantee for the electricity they generate.

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¹ EU-15 countries are considered, without the acceding countries since May 1st, 2004.



When comparing the annual growth rate for developing wind energy, countries within Europe and across the globe with fixed compensation for electricity fed into the grid are at the top: in 2003 Germany, Spain and Austria recorded the highest figures in newly installed capacity (see graphic). Denmark, Europe's wind pioneer, is also among the leading group who traditionally and now after a short pause, again uses a feed-in compensation model – although in a qualified sense.

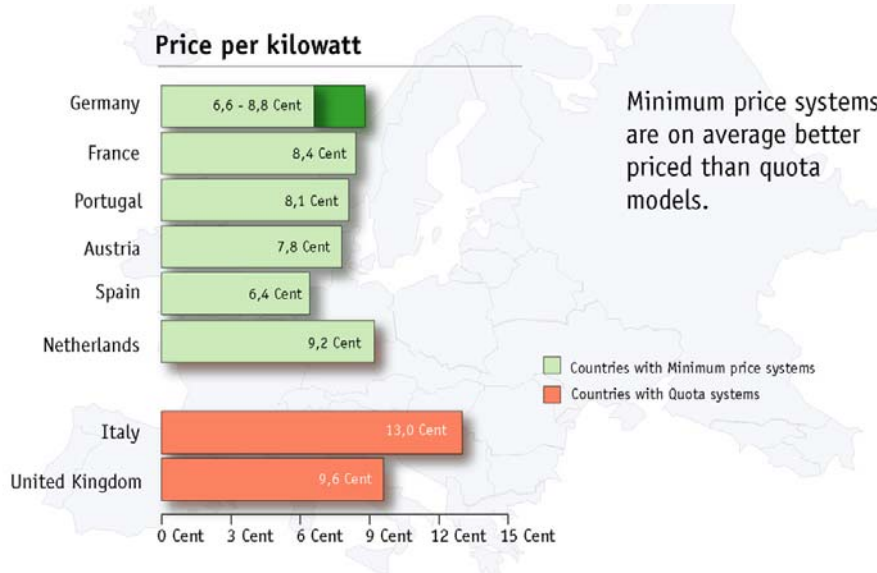
However, a system change is brought up in conversation again and again in the current debate in the individual countries and at the EU level. In the following document, the most important arguments for this are subjected to critical examination.

Background information:

Minimum price system compared with the quota model – which system is more efficient?

Claim number 1: "In comparison to minimum price systems, quota systems lead to higher cost reductions per generated kWh"

Quota system advocates argue with examples of increased competition among the producers and strongly falling prices for electricity from renewable energies. Often, the price reductions for wind power in the UK, brought about during the 90s under the Non-Fossil Fuel Obligation (NFFO), are mentioned. The current prices for wind power in EU countries are exemplified in the following graphic:



Explanations to the individual tariffs:

- 1) **Germany:** currently between 6.6 cent and 8.8 cent/kWh depending on the site
- 2) **France:** 8.38 cent for the first 5 years; thereafter the price drops depending on the number of full load hours (0-2000 = 8.38 cent, 2000-2600 = 5.95 cent, 2600-3600 = 3.05 cent), overall compensation period 15 years.
- 3) **Portugal:** Tariff depends on the number of full load hours; 8.1 cent refers to plants with up to 2,300 annual full load hours. The tariff up to 2,000 annual full load hours was 8.3 cents/kWh.
- 4) **Austria:** The tariff of 7.8 cent is uniformly paid. In 2003 in Austria there was a fiscal investment cost premium of 10% on all new investments (in 2004 as well).
- 5) **Spain:** Electricity producers can select between two tariffs: a fixed feed-in tariff (approx. 6 cent) or variable compensation rate. The variable compensation rate consists of a fixed price component (fixed premium) of 2.66 cent (2003) and the market price for electricity. In average it is 6.38 cent/kWh.
- 6) **Netherlands:** Wind power price is combined out of two components: a 4.9 cent fixed government surcharge (MEP) plus tax exemption (2.9 cent) plus a surcharge equals a unit price of 9.2 – 9.8 cent. The fixed surcharge (MEP) is granted, however, only for 10 years or 18,000 full load hours.



7) *Italy*: Certificate trading price (in 2003 at 8.4 cent /kWh) plus regular price of electricity, equals a compensation that in 2003 was between approx. 12.0 – 14.1 cent kWh. Certificates are only allocated for the first 8 years of the plant's operation.

8) *United Kingdom*: The price consists of the certificate trading price (in 2003, 7.0 cent/kWh), tax exemption (climate preservation tax/climate change levy) for renewable energies and the price of electricity.

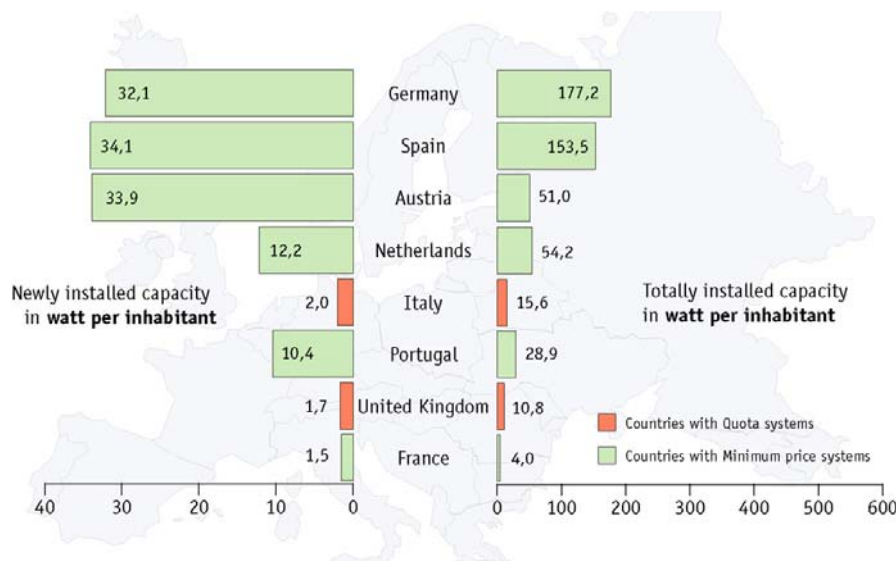
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A direct price comparison within Europe proves to be difficult because the individual systems are designed differently and the running time of a specific compensation level is also applied differently (see explanations).

Up until now, larger amounts of general data material is available for minimum price systems; in comparison, quota models represent only a small percentage of the installed capacity in Europe. In this respect the overview does not provide an absolute comparative possibility. However, obvious trends can be determined:

- In Germany, Spain and Austria almost 80% of new capacity in EU-15 installation took place in 2003. In addition to the percentage of newly installed capacity in general, its share per capita is interesting: the minimum price countries are far ahead of the quota countries.



- Concerning the costs, in the “quota countries” Italy and UK ² an average of 13.0 cent/kWh respectively 9.6 ct/kWh³ was paid for wind power. These prices are not lower, in fact, they are higher than the minimum prices paid in the other countries.

Experience up until now indicates that there is more of a reluctance to invest in wind energy in quota systems due to unstable medium and long-term certificate

² Current quota scheme in Italy since 1999/2001, in the UK since 2002.

³ According to the Department of Trade and Industry, prices for offshore wind power for the British certificate trading model totalled 11-13 cent/kWh in 2003. These prices came about because offshore projects in the UK additionally receive large investment grants from the State.



and electricity prices. These can strongly vary due to changes on the market or meteorological conditions. If invested, higher risk surcharges from investors and banks are to be expected. Therefore, electricity does not become cheaper even in countries with very favorable wind conditions.

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Claim number 2: “Quota systems lead towards achieving precise objectives and provide security regarding the share of renewable energies in the electricity market”

The quota system intends for a specified quantity of electricity from renewable energies to be generated at a specified point in time.

In Italy, the green certificate trading model started in January 2002. An additional 2% of regenerative electricity was prescribed in the first few years⁴, up until now this goal has been reached. This meant additionally installing 116 MW wind power capacity in 2003. Another 2% is calculated for 2004, thereafter the quota should increase annually up to a total of 3.05% in 2007. However, the security for investors is limited: The quota is only valid over a period of 8 years; each certificate scheme is valid for this period.

In 2002 a quota system with a certificate trading model (Renewable Obligation Certificates) was introduced in the UK. Energy supply companies (ESCOs) are expected either to produce green electricity, purchase certificates or they can buy themselves out of their obligation⁵. In 2003 the quota was at 3%, however, it clearly fell short achieving only 1.8%. The larger the number of companies that purchase themselves out of their duty, the more the certificate trading prices increase. The money of the so-called buy out funds is distributed to the owners of ROCs. Thus, the ROC price in England and Wales is currently at 7 cent/kWh and in Scotland it is 8.1 cent/kWh. Although in the meantime the political frameworks have been set for the long-term: a power consumption rate of 15.4% from renewable energies is to be covered by 2015. However, the insecurity for investors remains over the medium and long-term development of the ROC share and with it the price of the certificate.

Critics of the minimum price system also claim that if attractive tariffs are applied, new capacity installation proceeds quickly and the additional burdens on the electricity customers also increase incalculably. As a matter of fact, the contingents of wind power in Denmark, Spain and Germany have grown quickly under the minimum price system. Nevertheless, the costs of allocation for front-runner Germany (contingent of 8% electricity from renewable energies) with 1 Euro per household/month are justifiable. At the same time, a legally

⁴ Conventional energy producers and importers must prove that a minimum of 2% of the quantity of electricity produced and fed into the grid in the previous year was generated from renewable energies.

⁵ Currently for a price of approx. 45 €/MWh



fixed price degression has already been introduced into the Renewable Energy Sources Act, which came into force in 2002 (see below).

Claim number 3: "Quota systems prevent windfall gains"

Minimum price systems are assumed to encourage little competition and exclude price reductions. Manufacturers and planners would utilize price reductions to increase profit; the reduced costs would, however, not be passed on to the electricity customer. In contrast, the quota system would force manufacturers into price competition during bidding rounds and as they close contracts.

Regarding the minimum price system, possible windfall gains can be avoided by accordingly designing the respective system. The German Renewable Energy Source Act (EEG) for example contains an integrated price degression (to date 1.5%, the amended law allots a future annual price degression of 2%). Similar mechanisms were introduced in France and Portugal, for example. Altogether the costs for wind power in Germany have in real terms fallen around 55% since 1991 (as the Electricity Feed-In Law which precede the EEG took effect).

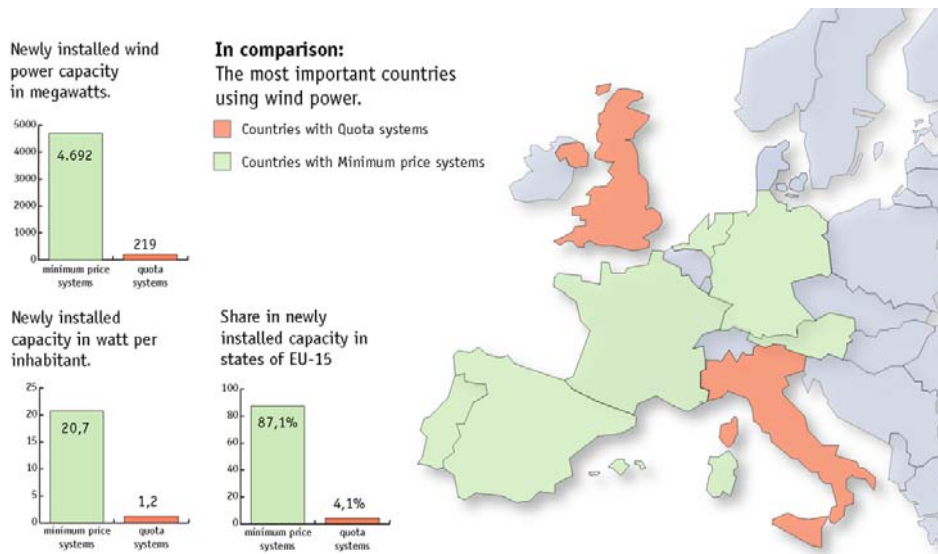
It can generally be stated that minimum price systems have largely contributed to developing national industries by creating long-term secured political frameworks. This per se leads to increased competition, accelerated technological development and job creation. Up until now, quota systems and bidding models have scarcely contributed to developing the local industry: in the UK, during the NFFO rounds for example, already existing providers that mostly came from abroad were resorted to – due to time constraints. A similar situation occurred in France, where only two smaller-scale French providers could establish themselves during the bidding rounds performed in the past.

Summary: to date minimum price systems are more successful

Up until now the minimum price system has enhanced the development of renewable energies most successfully. These systems are flexible in design and changes in technology and the market can be taken into consideration. Small and medium-scale companies are especially promoted. These companies compete among themselves and therefore are interested in improving their efficiency. Furthermore, making legal adjustments can increase efficiency. The transaction costs are low and the financing mechanisms are easily implemented.

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In contrast quota systems involve huge insecurities for investors: for the most part, small and medium-sized companies cannot bear the high risk for their investment because of the long-term framework. Up until now such models to promote renewable energies have been implemented in various designs and in a series of countries. One noticeable fact is that up until now no large independent industrial sector has emerged in these countries to manufacture renewable energies. However, in the long term this is indispensable, if further development of technology and tapping the full cost reduction potential by increasing efficiency and performance are to be achieved. The costs for wind power in the quota countries are currently above those in countries with the minimum price system.

Moreover, considerable transaction costs for organizing, implementing and monitoring are to be included for quota models ⁶.

Applying any system must be supported by creating additional positive framework conditions. Among other things, this pertains to additional grid capacity expansion, adjustments in building laws and encouraging acceptance through broad participation models and controlled land usage.

Under these circumstances minimum price systems can achieve their ideal effect: a rapid development of renewable energies that is cost efficient and creates jobs at the local level. As a result, renewable energies make a continually increasing contribution to the local energy supply and are a central pillar for preserving the climate worldwide.

⁶ This concerns the design of the model as well as its implementation of allocating and regulating certificates, monitoring compliance and if necessary, implementing disciplinary mechanisms.