Organization for Security and Co-operation in Europe
Office in Baku

The Importance of the Legal and Regulatory Framework for the Development of Renewable Energy

---

Paper accompanying a keynote presentation held at the
10th Baku International Congress – "Energy, Ecology, Economy",
Baku, 23rd September 2009
on behalf of the OSCE Office in Baku.

Author:
Ms. Tatjana Tupy
E-Mail: tatjana.tupy@sbg.ac.at
Phone: +43 1 292 28 85

Point of Contact at the OSCE Office in Baku:
Mr. Robert Zahn
Economic and Environmental Officer
Email: robert.zahn@osce.org

Table of contents

1. Abstract

As fossil fuels are coming to an end the development of renewable energy sources (RES) is of crucial importance to satisfy our energy needs. This paper gives a rough overview of the most important aspects that should be taken into account when politically fostering the establishment of a functioning renewable energy (RE) market. The introduction presents the various RES and technologies, the reasons for the necessity of changing our energy supply system and outlines the barriers that still have to be overcome. Next the paper will focus on RES for electricity production and then consider the statements relevant to RES in the heat and transport sector. In the second section, the importance of a stable and favourable legal and regulatory framework for RES development is stressed. Some practical examples from Germany and the United Kingdom outline the advantages and disadvantages of two different RES support schemes, namely feed-in tariffs and quota systems. The last section tackles the question of how to find the most suitable policies for RES deployment when adapting to the specific needs of a country.

2. Renewable energy – an introduction

Renewable energy can be roughly divided into five main groups, according to the different energy sources used (see fig. 1). One of the old and already widespread technologies is **hydro power**. In general, only small hydropower systems with a capacity of up to 10 or 20 MW are considered to be renewable technologies since larger projects often have deep negative impacts on the environment. Electricity is primarily generated with the help of run-of-the-river plants or pumped storage systems. These established technologies have recently been joined by new concepts which make use of ocean energy in the form of tidal or wave power. **Bio energy** includes all kinds of organic material that can be used for the generation of electricity, heat or renewable fuels. It exists in three different conditions: massive, liquid and gaseous bio energy. The huge advantage of bio energy is that it can be rather easily stored which makes it possible to produce and use energy on demand. **Geothermal energy** refers to energy stored in the form of heat inside the earth, which is available throughout the year. The energy found in shallow depths can be used for heating as well as cooling purposes with the help of heat pumps. Higher temperatures in deeper layers are also suitable for electricity production. A variety of technologies exists for making use of the energy of the sun. Photovoltaic systems directly convert **solar energy** into electricity. Solar thermal systems provide hot water and space heating, while concentrating solar power technology works with very high temperatures to produce electricity in areas with good solar irradiation levels. Last but not least, **wind energy** can also be employed for electricity production. Wind turbines are either located on land (onshore) or at sea (offshore).

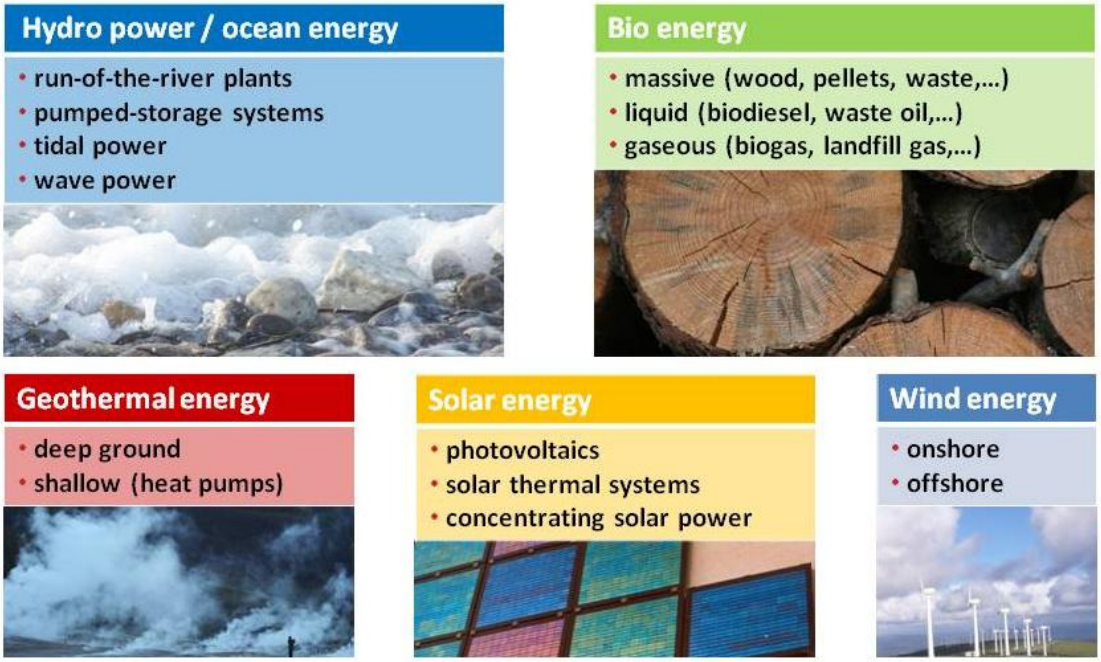

Fig. 1 – Overview of renewable energy sources

There are at least three fundamental reasons to change our energy supply system from a system dependent on fossil fuels to one relying on RES:

- Many countries do not have a self-sufficient energy supply structure and thus have to face a growing dependency on energy imports.
- Fossil and nuclear fuels are coming to an end and the shortage of resources will result in rising energy prices.
- Climate change requires immediate action to prevent dramatic consequences. Thus, it is necessary to dramatically reduce the emission of greenhouse gases.

The answer to these challenges lies in RES which offer everlasting, sustainable and climate friendly options. Furthermore, RES can reduce dependence on energy imports, create local jobs and increase domestic and regional value. Figure 2 shows an example of how the current fossil and nuclear based energy supply system could be changed to a system relying 100% on RES. It is important to stress that these kinds of scenarios are only realistic in combination with other energy efficiency measures which aim to significantly reduce our current energy needs. It is also clear, that one renewable energy source on its own cannot provide all the energy needed. Only a suitable mix of all the available sources can offer a solution.

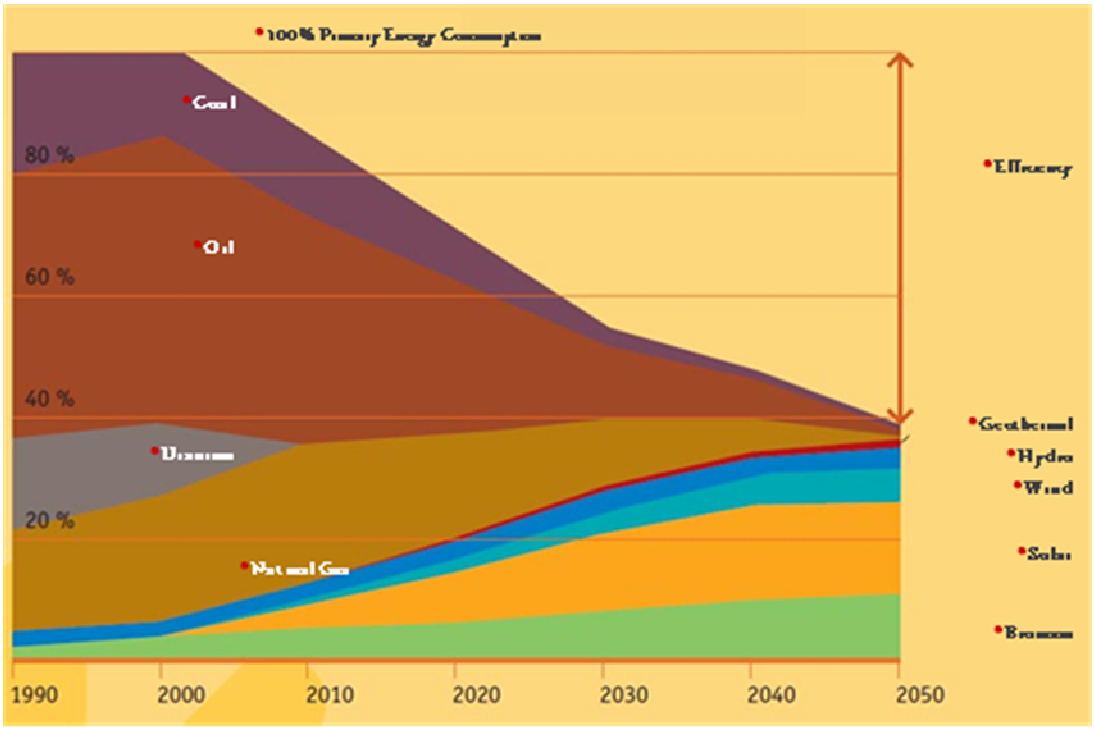

Fig. 2 – Changing a fossil and nuclear based model to a 100% RES energy supply system, study for Europe from 1996, source: LTI Research

A fundamental change of our current energy supply system is not an easy task since RES still have to face a number of challenges. The current energy system is based on a centralized conception, dominated by a few large corporations and thus prevents a decentralized RES system from developing. In addition, weak grids often cannot cope with the fluctuating energy loads from renewable electricity production. Other barriers include the high initial investment costs of renewable energy technologies and the fact that external costs of conventional energy production, such as environmental pollution, are not included in the electricity retail price. Nevertheless, cost competitiveness for RES is expected to improve in a few years time thanks to technological development and the economy of scale effect. Another obstacle is the continuous provision of renewable energy which depends on the availability of natural resources such as the sun and wind. This links to the question of how to store the energy so that it is available when demand is larger than the existing production capacities.

3. The importance of the legal and regulatory framework for RES

When taking into account the mentioned barriers for the deployment of RES it becomes clear that these technologies need political support to improve their chances of entering into existing energy markets. RES support policies aim to reduce barriers for RES deployment, provide a level playing field, kick-start RES industry development, build up RES market capacities, make RES cost competitive, mitigate climate change and increase energy independency. Rather than offering continual supervision, these policies should instead offer initial support so that RES reach a point

where they may compete against conventional sources independently. Support for RES can be classified into three main categories which should not be seen as distinct from each other, but rather as overlapping:

- Direct promotion through support programmes for RES.
- Indirect promotion through measures aimed at disadvantaging conventional energy.
- The creation of a favourable legal and regulatory framework

3.1 Direct promotion

There are two main instruments for direct renewable energy promotion: feed-in tariff systems and quota systems. In general, countries opt for one of these systems and supplement them with subsidies, soft loans and/or fiscal support measures.

Feed-in tariff systems exist in a large variety of designs but nevertheless share some general characteristics. Figure 3 shows a simplified scheme of a feed-in tariff system. Utilities are obliged to connect independent power producers to the grid. RES plant operators receive a fixed and guaranteed tariff from the grid operators for electricity fed into the grid. Tariffs are often paid for a set period of time. The tariff amount usually takes into account the costs of the technology used, the year the system was put into operation and the size of the plant. The remuneration for the investor is set according to the market stage of the different technologies, which makes the investment reasonably profitable. Tariffs should decrease annually to provide an incentive for manufacturers to reduce costs.

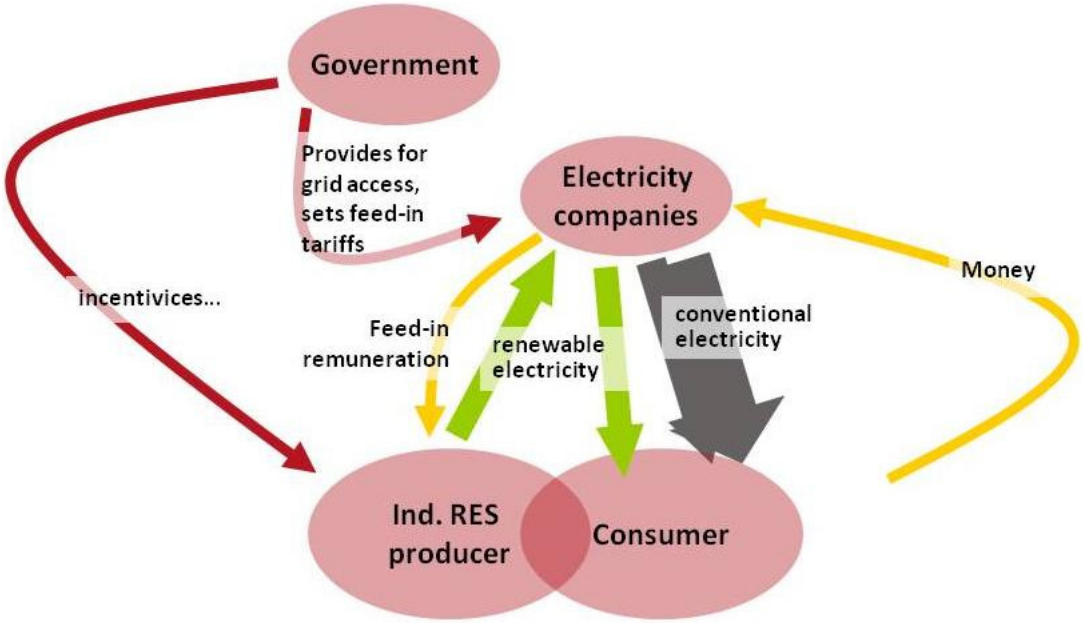

Fig. 3 – Scheme of a feed-in tariff system, source: BSW Solar (2008)

The additional costs arising from the feed-in tariff system are usually borne by all final electricity consumers in the form of a surcharge on their electricity bill (see fig. 4).

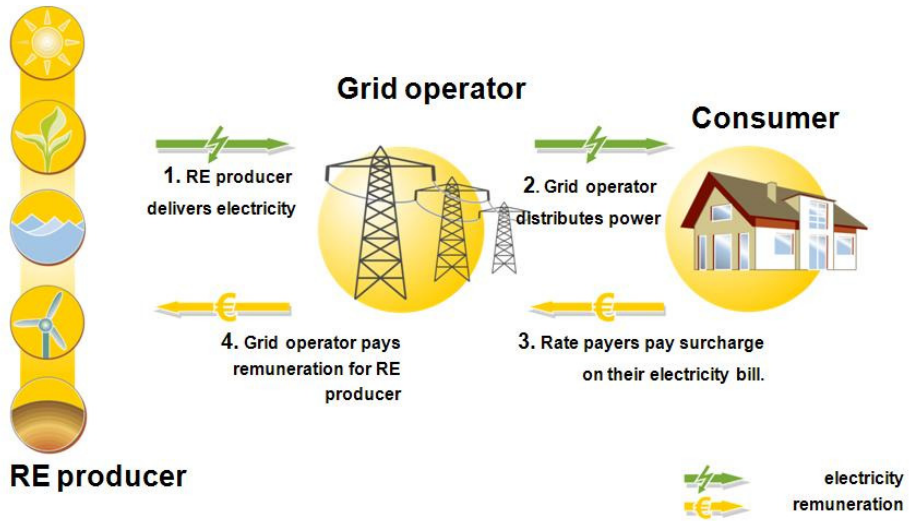

Fig. 4 – Apportionment of costs in a feed-in tariff system, source: AEE

Quota systems have a more complicated design as shown in figure 5. Quotas are set by the government to reach annually growing RES targets. Usually utilities have to prove that a certain share of the electricity sold comes from RES. Utility companies are free to produce renewable electricity on their own or to buy it from independent producers. For the electricity produced, plant operators receive tradable green certificates. The value of the certificates depends on offer and demand in the certificate market. In addition, the produced electricity is traded in the spot market. For non-compliance of the set quota, penalty payments have to be made by the utilities.

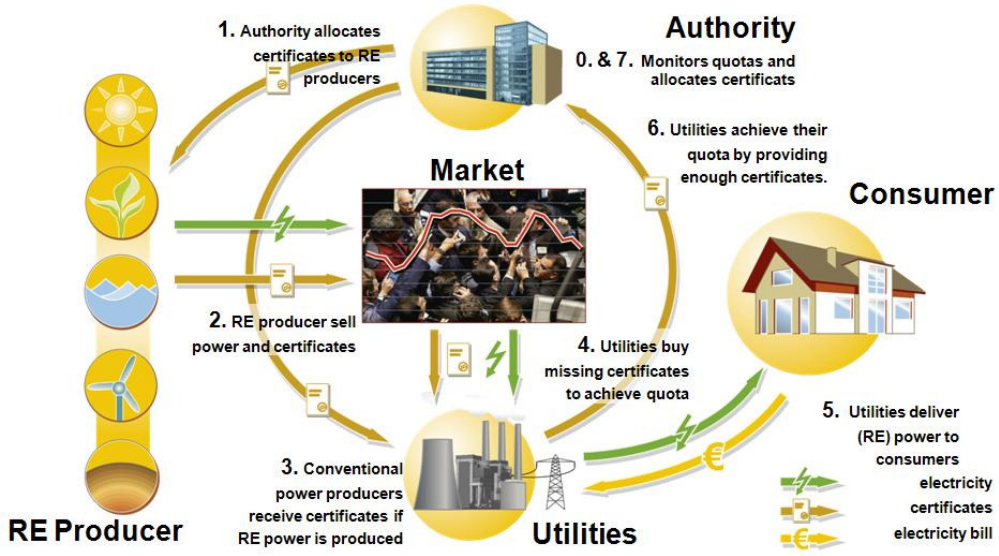

Fig. 5 – Scheme of a quota and certificate system, source: AEE

Subsidies and soft loans aim to provide production incentives for energy consumed by private individuals, companies or public institutions. They reduce the burden of the initial investment by financing parts of the system and/or the installation costs. Money is usually provided from the state budget or, in the case of loans, from state banks. The total amount of money available in a support programme is often capped.

In the case of promotion through **fiscal incentives**, RE producers are either exempt from certain taxes (e.g. energy tax), entitled to lower tax rates (e.g. reduced VAT) or have tax credits applied (e.g. exemption from income/corporate tax). Tax incentives can be applied to the investment costs or to the electricity produced. The effectiveness of fiscal incentives depends on the applicable tax rate. Administrative burdens are usually low, which makes fiscal incentives an attractive option for promotion.

3.2 Indirect promotion

Other means of promotion can indirectly foster the development of RES. Since fossil and nuclear sources of energy are heavily subsidized, a reduction, or even abolishment, of R&D budgets and direct support for the conventional energy industry would benefit RES. As a further means of promotion, fossil fuel taxation increases the competitiveness of RES, takes into account external costs of conventional energy generation and can at the same time create awareness for the growing scarcity of fossil fuels among the general public. Additional awareness raising campaigns are a key step in creating a positive image of RES, encouraging identification with the climate friendly energy production technologies and informing the public of their potential.

3.3 Creation of a favourable legal and regulatory framework

Experiences from numerous countries show that even if well-designed RES support programmes are in place, arduous bureaucratic procedures and administrative hurdles and difficulties in accessing the electricity grid can prevent rapid market development. Without the creation of a favourable legal and regulatory framework RES will be condemned to remain a small niche market. Therefore, a key precondition for the development of renewable energies is the reduction of technical, legal and administrative barriers. Preferential access to the grid in all aspects (grid connection, grid usage and grid expansion) has to be guaranteed so that the incumbent energy industry is deprived of the opportunity to deny or delay grid access for RES. In addition, smooth bureaucratic application procedures have to be ensured. For example, clear and simple regulations about the licences required for the building and operation of RES systems are a crucial necessity. All rules should be as simple as possible. Ideally, one comprehensive RES law should contain all the important provisions.

4. The German EEG and the ROO in the United Kingdom – a comparison

Germany and the United Kingdom (UK) have opted for two different ways of promoting renewable energy (see tab. 1). While Germany relies on a feed-in tariff system (Renewable Energy Sources Act – EEG), the UK introduced a quota system (Renewables Obligation Orders – ROO) as the main instrument of promotion. In both countries all RES are eligible for support, however, the German feed-in tariff is much more fine-tuned to the different technologies. For a long time in the UK all technologies were attributed the same number of certificates, regardless of the different electricity generation costs. Since April 2009 this has been changed. Technology specific certificates favour more expensive technologies such as photovoltaic systems in order to ensure a higher degree of competitiveness. Where investment security is concerned, Germany, without doubt, has the edge over the UK. The tariffs set by the EEG are guaranteed for a period of 20 years while the ROO offers neither a fixed period nor a guaranteed duration of payment. The costs for the promotion are, in both cases, borne by the final consumers. In Germany, a sophisticated system for the apportionment of costs guarantees an equal distribution of the burden, while in the UK the costs are taken into account through the electricity price.

	Germany (EEG)	**United Kingdom (ROO)**
Type of promotion system	Feed-in tariff	Quota system
Promoted technologies	All RES	All RES
Obligated party	All grid operators	All electricity suppliers
Amount	Depending on date of commissioning, technology, system capacity & location	Quota: 9.7 % for 2009/10 Technology specific certificates since 04/2009
Duration	Guaranteed payment for 20 years	No guarantee, no limitation
Funding	Final consumers through distribution mechanism	Final consumers through electricity price

Tab. 1 – Comparison of the German EEG and the ROO in the United Kingdom, source: RES LEGAL (2009)

Table 2 shows a comparison of grid access regulations in the two countries. While in Germany specific regulations for RES are included in the EEG, access to the grid for RES in the UK is only regulated by the general Electricity Act. In both countries RES are entitled to grid connection and grid usage, and, if necessary, to an expansion of the grid capacity on part of the grid operator. The biggest difference is that the EEG guarantees priority to RES and does not ask for any contracts. The Electricity Act in the UK does not foresee a need to prioritize RES and instead focuses on establishing rules for the relationship between plant and grid operators.

	Germany (EEG)	UK (Electricity Act)
Grid connection	▪ Immediate and preferential connection for RES ▪ No contract required ▪ Costs borne by plant operator	▪ Entitlement to connection without priority ▪ Contract required ▪ Costs borne by plant operator
Grid usage	▪ Purchase & transmission of all RES electricity a priority ▪ No contract required ▪ No charges for transmission	▪ Transmission without priority, limitations possible ▪ Contract required ▪ Costs borne by plant operator & consumers
Grid expansion	▪ Obligation to immediate optimisation, expansion or boosting of the grid in case of necessity ▪ No contract required ▪ Costs borne by final consumers	▪ Possible entitlement to grid expansion if necessary ▪ Contract required ▪ Costs borne by plant operator & consumers

Tab. 2 – Comparison of grid access regulations in Germany and the United Kingdom, source: RES LEGAL (2009)

As a result, Germany, the country with the more favourable policies on RES, also has a higher level of renewable energy usage Figure 6 illustrates the capacity of installed wind energy over a number of years. Wind energy capacity in Germany had risen from 48 MW in 1990 to 4,500 MW in 2000 when the EEG replaced the previous less sophisticated feed-in tariff law. Under the EEG, installed wind capacity rose to 20,622 MW by the end of 2006. In contrast, installed capacity of wind energy in the UK has remained low, increasing from 10 MW in 1990 to only 1,960 MW by the end of 2006 when the ROO had already been in place for 4 years.

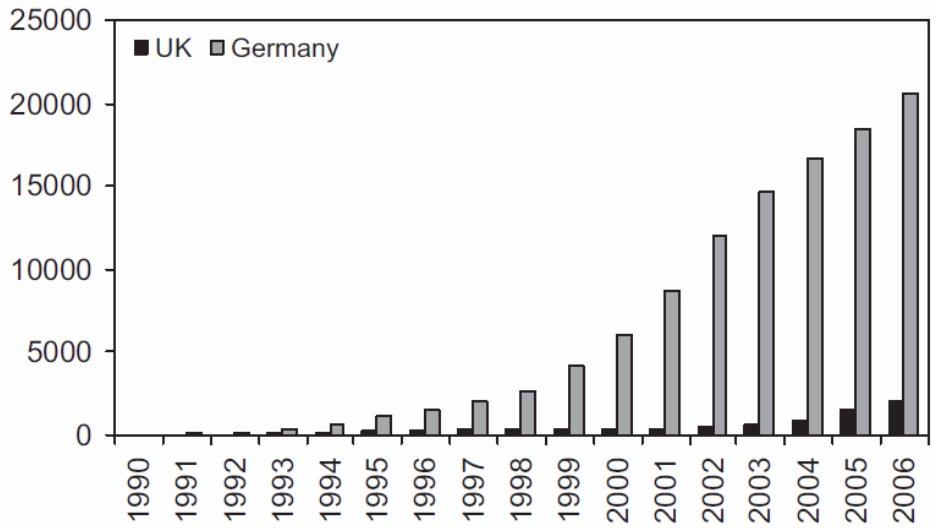

Fig. 6 – Installed wind power capacity in Germany and the United Kingdom, source: Butler/Neuhoff (2008)

The German example also shows that the RES industry creates jobs (see fig. 7). According to the interim results of a research project, funded by the Federal Ministry of the Environment, it is estimated that almost 280,000 jobs in Germany existed in the renewable energies sector in 2008. Compared with 2004, this means an increase of about 75%. Around two-thirds of the jobs have been created thanks to the EEG.

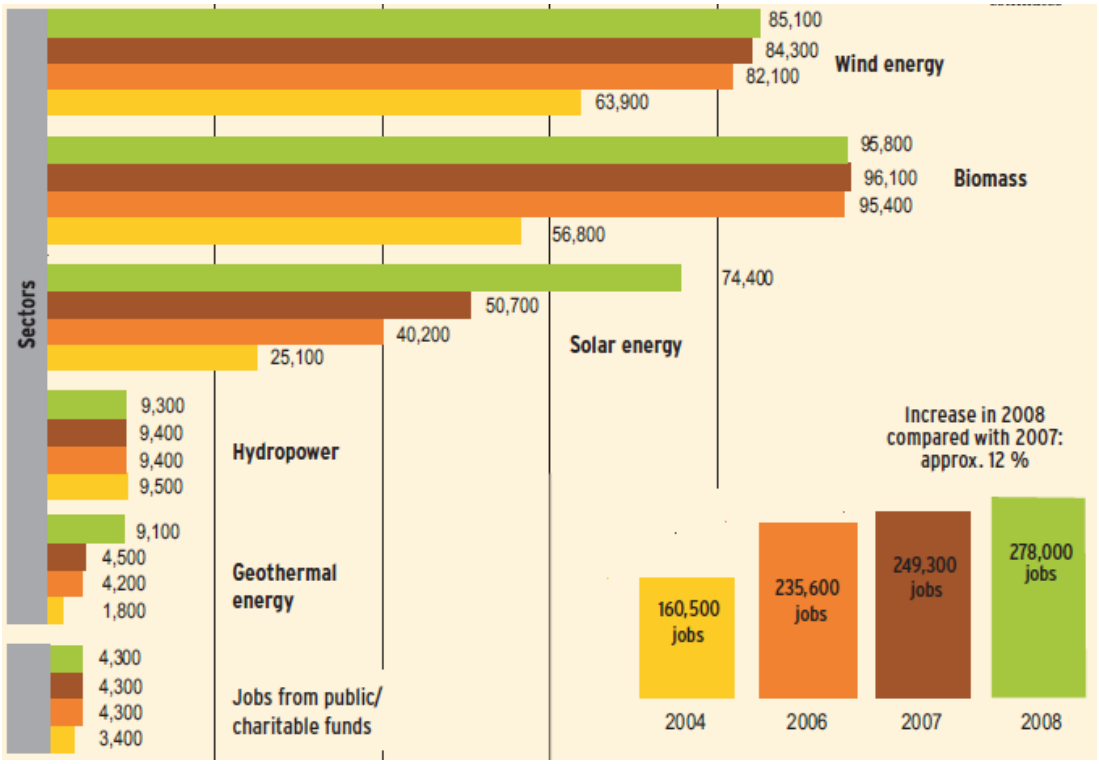

Fig. 7 – Jobs in the RES sector in Germany, source: BMU (2009)

A similar positive picture is revealed when analysing the turnover from RES in Germany (see fig. 8). Between 2003 and 2008, the total turnover from RES increased by 188% and reached a sum of around 28.8 billion Euros. Renewable energies have thus become a significant part of the German economy.

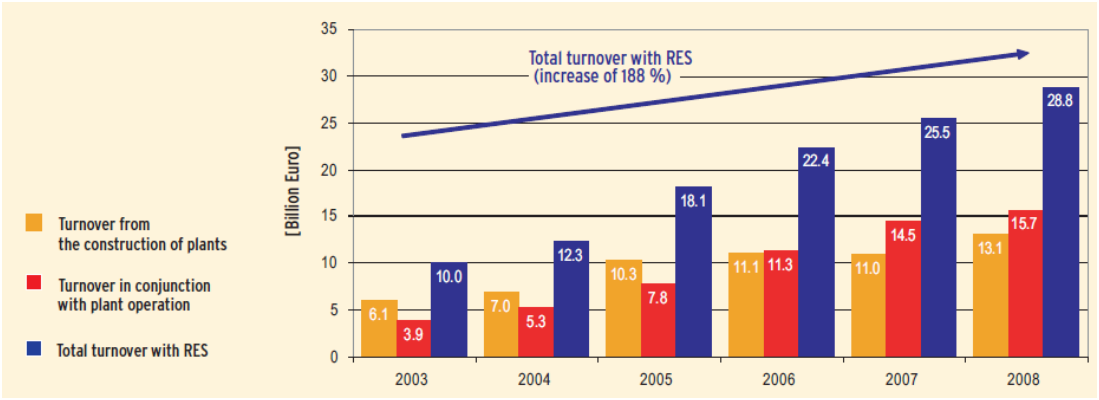

Fig. 8 – Development of turnover from RES in Germany, source: BMU (2009)

5. How to find the most suitable policies for RES development?

The issue of deciding which policies for RES development to chose cannot be answered in a general way. There is not one perfect support scheme that could be recommended for all countries. The choice depends upon different factors such as: the current market stage of the technologies, the budget available or the means of finance, the anticipated RES targets, as well as the desirability and feasibility of the technology mix, with regard to the natural conditions in the respective country.

Three main steps should be taken in order to effectively encourage RES deployment which must be viewed as overlapping developments, rather than as consecutive stages. The processes should be accompanied by continuous monitoring and improvements and amendments to tools and strategies should be made when necessary.

- **Setting of RES targets & determination of the overall strategy**

Support schemes for RES are most effective if embedded in a broad national renewable energy strategy. Long-term mandatory RES targets need to be established, as they are an important signal for the RES industry and represent the first precondition required for certain investment security. The targets should be ambitious but feasible and should determine the future energy mix of the country. Technology specific targets should take into account the market and industry developments that are aimed for and promote a broad portfolio of RES.

- **Trigger first demand, back R&D activities**

In order to build up and develop a market, best practice approaches should be put forward with the help of temporary demonstration programs. In this regard, grants as well as tax incentives have shown to be a suitable means for triggering a first demand for RES. In addition, budgets for research and development need to be set in order to provide innovation and excellence in RES technology development.

- **Legal & regulatory framework, support policies, training & awareness**

A successful development of the RES market will only occur within a favourable, clear and comprehensive legal and regulatory framework that constitutes a solid foundation for adequate long-term support policies. This includes legally laid down effective RES support schemes with stable long-term investment security, a simple and efficient renewable energy law, guaranteed and priority grid access and the removal of barriers regarding authorisation procedures and access to support schemes. As accompanying measures, training and certifications have to be built up in order to provide people with the necessary skills for planning, installing and maintaining RES capacities. In addition, awareness raising campaigns aimed at informing and involving the general public should be put into place.

6. Further reading

Ackermann, Thomas / Göran Andersson / Lennart Söder (2001). Overview of government and market driven programs for the promotion of renewable power generation, in: Renewable Energy 22, 197-204.

BMU (2009). Legal sources on renewable energy, www.res-legal.eu

BMU (Ed.) (2009). Renewable energy sources in figures. National and international development, Berlin.

Federal Environmental Agency (Ed.) (2007). Monitoring and evaluation of policy instruments to support renewable electricity in EU Member States. Final report, Dessau.

Haas, Reinhard et. al (2004). How to promote renewable energy systems successfully and effectively, in: Energy Policy 32, 833-839.

Lipp, Judith (2007). Lessons for effective renewable electricity policy from Denmark, Germany and the United Kingdom, in: Energy Policy 35, 5481-5495.

REN 21 (Ed.) (2008). Renewable Energy Potentials. Opportunities for the Rapid Deployment of Renewable Energy in Large Economies, Its Impacts on Sustainable Development and Appropriate Policies to Achieve it, Paris.