# Energy Policy Strategies

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## CONTENT

# 1. ABSTRACT

As the world is faced with rising global temperatures and CO2 levels as well as the depletion of fossil resources countries across the globe countries are challenged to include renewable energies in their energy mix. In their attempt to promote the use of renewable energy they use various strategies to try and guide their population and industries in a direction that they deem favorable and implement different strategies to do so. In this attempt the European Union has set targets for Renewable Energy Figures which the EU Members have to achieve on a national level. Each country has its own approach with regard to its legal framework and support instruments. These different approaches shall be gathered and compared with special focus on Austria and the Czech Republic. Similarities and differences in the use of financial instruments shall be identified. It shall be observed which instruments prove as especially popular and whether any instrument or combination of instruments proves as a best practice model. Such a conclusion could serve as a guideline for the future use of energy policy strategies on a European and national level.

# 2. PAPER

## Introduction

Since the founding of the attempts at a common European energy policy have been made but lacked a legal framework. In 2006 the European Commission published the green paper on sustainable, competitive and secure energy and later in 2013 the green paper for the 2030 framework for climate and energy policies. Those green papers serve to start the discussion on how to proceed in energy affairs. In 2009 the European Commission published Directive 2009/28 repealing Directives 2001/77 and 2003/30 in order to promote the further use of renewable Energy. This directive states the 20-20-20 targets. (Rainer Hinrichs-Rahlwes 2013)

• 20% share of renewable energy

• 20% increase in energy efficiency

• 20% reduction of CO2 Emissions

• 10% share of renewable energy in the transport sector

Those 20% targets hold for European communion as a whole but are translated into individual targets for the individual member states, while each state has to fulfill the 10 % target in the transport sector. Each state therefore has its own targets taking into account its current level and renewable energy potential. As a result each state sets its own targets in its National Renwable Energy Action Plan which serves as a road map on how to reach those targets. Targets are specified by the Czech and Austrian NREAPs as follows.

**Table 1**

| *Situation 2005* | *Res-E* | *Res-H* | *Res-T* | *Over all* |
|---|---|---|---|---|
| Austria | 60.8 | 24.3 | 2.3 | 24.4 |
| Czech Republic | 4.5 | 8.4 | 0.1 | 6.1 |
| Target | *Res-E* | *Res-H* | *Res-T* | *Over all* |
| Austria | 70.6 | 32.6 | 11.4 | 34 |
| Czech Republic | 14.3 | 14.1 | 10.8 | 13.5 |

The NREAPs also list the planned measures on how these targets are to be achieved in their Section 4. These measures can be classified into strategic, regulatory and financial measures. The financial measures can themselves, as in [4], be classified into feed-in Tariffs, feed-in premiums, tenders, quota obligations, investment grants, fiscal measures and financial support. Table 1 shows a list instruments and a short description. To clarify those terms a broad definition of each instrument shall be given.

- Feed-in Tariffs: Feed-in tariff means a long-term contract that guarantees a certain price per unit to renewable Energy producers for their electricity/heat. This payment depends on the type of technology used and is supposed to compensate for the costs associated with the method of production.

- Feed-in Premiums :Feed-in premiums are additional payments per unit to renewable energy producers in addition to the achieved market price.

- Tenders: Tenders are a call for bids for projects or production capacity. Investors and companies are invited to give their offers and the most suitable offer is awarded the contract

- Quota Obligations: Quota obligations require energy suppliers to have a certain share of renewables in their energy mix. Non compliance usually results in a penalty.

- Investment Grants: Investment Grants are payments to RE-companies to invest in RE-Projects.

- Fiscal Incentives: Fiscal incentives are tax measures which make the use of renewable energy more attractive, such as a reduced consumption tax for companies with a high RE share.

- Financing Support: Financing Support means any measures which help RE Companies finance their projects, such as low interest loans, or the government covering interest payments.

The target of this paper was to give an overview of the renewable Energy Strategies used throughout the union and how they utilize the instruments mentioned above as well as their effect on the RES-share and to analyze if any strategy proves especially successful

## Methodology

The Method used for this paper was Literature Research and data accumulation and evaluation. Data on the current shares of RES was taken from Eurostat. In order to find the predominant Strategy, Data on the individual Member states were obtained from the online sources of the European Union, res-legal.eu. Information on a countries planned strategy was taken from the NREAPs of individual Members states as well as their laws regulating support instruments.

## An overview of European policies

In 2014, according to ”res-legal.eu”(accessed 2015), 19 countries implemented some form of FIT for Res-E , 8 Countries implemented some form of FIP and 5 countries implemented a quota system. Table 2 illustrates which countries use which instruments on a national level. This goes in line with the analysis by Poul Erik Morthorst Lena Kitzing, Catherine Mitchell (2012). (21, 7, and 6 in 2011).

**Table 2 (Data gathered from res-legal)**

| ***RES-E Instruments*** | ***FIT*** | ***FIP*** | ***Quota*** | ***Additional*** |
|---|---|---|---|---|
| Austria | yes | no | no | |
| Belgium | no | no | yes | |
| Bulgaria | yes | no | no | |
| Croatia | yes | no | no | Loans |
| Cyprus | no | no | no | Subsidies and Net Metering |
| Czech Republic | yes | yes | no | Subsidies |
| Denmark | no | yes | no | Loans, Net Metering, Subsidies |
| Estonia | no | yes | no | Subsidies |
| Finland | no | yes | no | Subsidies |
| France | yes | no | no | Tenders, Tax regulations |
| Germany | yes | yes | no | Loans and Subsidies |
| Greece | yes | no | no | Subsidies, Taxes and Net Metering |
| Hungary | yes | no | no | Net Metering |
| Ireland | yes | no | no | Grants and Tax relievs |
| Italy | yes | yes | no | Net Metering, Tax regulations, Tenders |
| Latvia | yes | no | no | Net Metering |
| Lithuania | yes | no | no | Subsidies, Loans, Tax Regulations |
| Luxembourg | yes | no | no | Subsidies,Tax Regulations |
| Malta | yes | no | no | |
| Netherlands | no | yes | no | Net Metering, Tax regulations, Loans |
| Poland | no | no | yes | Tax incentives,Loans, Subsidies |
| Portugal | yes | no | no | |
| Romania | no | no | yes | Subsidies |
| Slovakia | yes | no | no | Subsidies, Tax regulation mechanisms |
| Slovenia | yes | yes | no | Loans and Subsidies |
| Spain | yes | yes | no | |
| Sweden | no | no | yes | Subsidies and Tax regulation |
| United Kingdom | yes | no | yes | Loans and Tax, CfD |
| Total: | 19 | 8 | 5 | |

This table shows that a strong tendency for a lot of countries to use feed-in tariffs as their main support instrument for RES-E, in combination with a range of minor supporting measures. No conclusion can be drawn on whether the change in instruments from 2011 to 2014 is due countries changing their strategy or differences in data used. The data also does not give any indication on whether this trend is preferable or not. A strategies effectiveness can be measured by the Policy Effectiveness Indicator.(Ragwitz et. Al. 2012) This Indicator shows how much of the 2030 Potential of a Renewable Energy Technology are being utilized. When comparing the indicator for different technologies one can see FIT, as the top performing scheme, but Quotas and Tenders to perform well in certain situations.

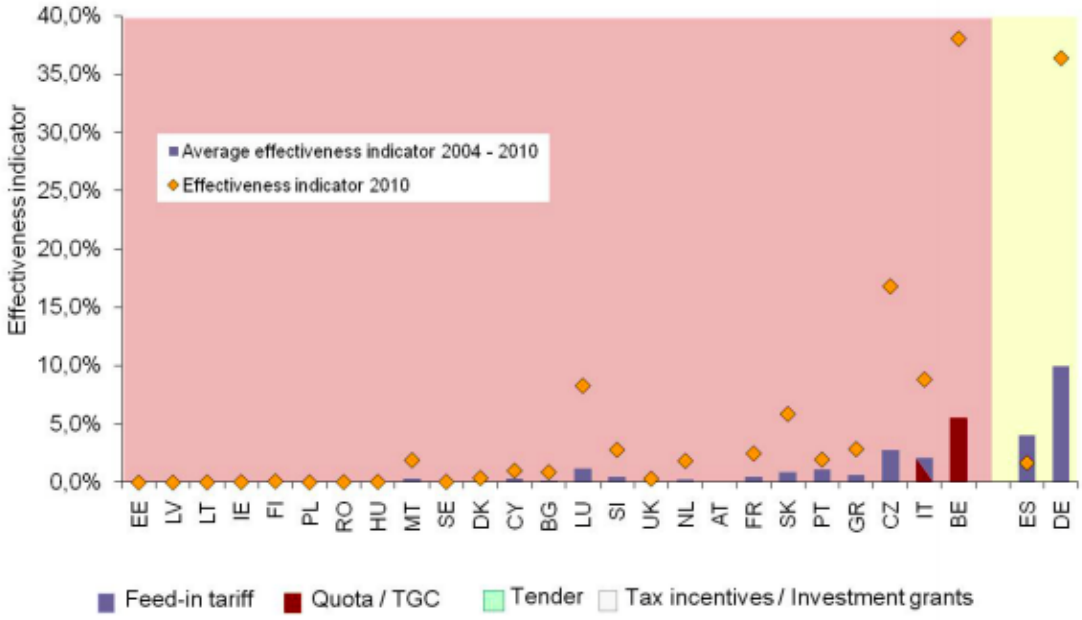


**Figure 1 Effectivenes Indicator Solar PV (Image taken from D17 Report)**

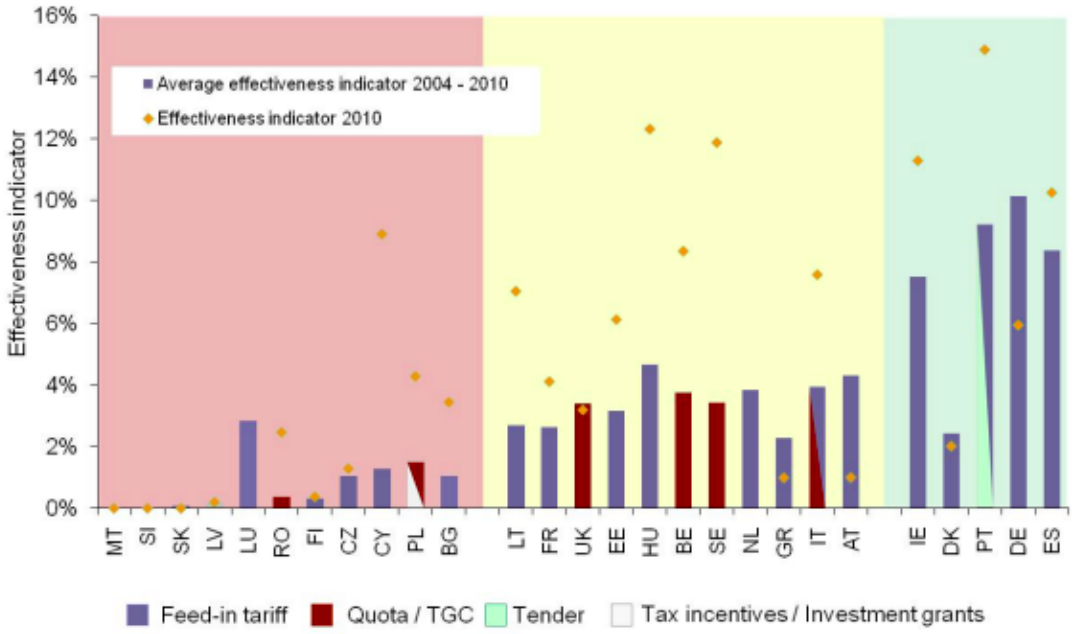


**Figure 2 Effectivenes Indicator OnShore Wind (Image taken from D17 Report)**

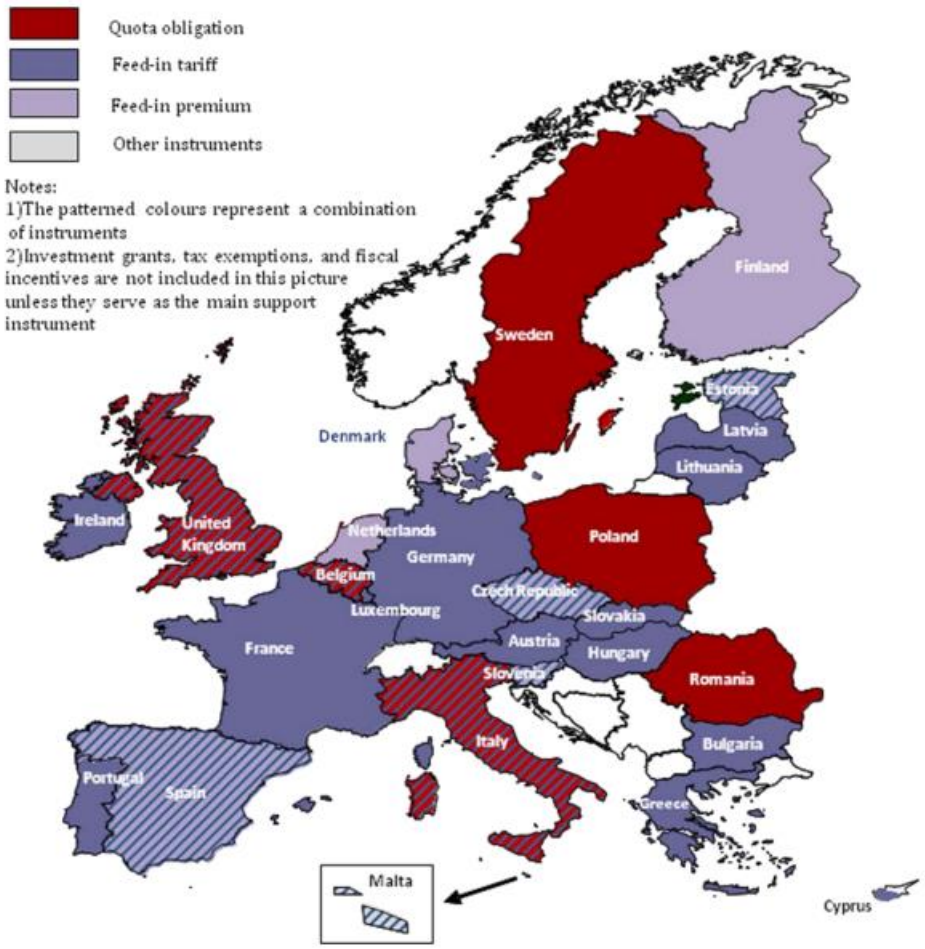


**Figure 3 Main support instruments applied in EU27 Member States (Image taken from D17 Report)**

## Situation in Austria

In 2009 Austria's government, in cooperation with stakeholders from different sectors, published it energy strategy. This paper outlines the strategy behind Austria's future energy and climate policies. It shows a strong commitment to renewable energy sources and targets for the sectors electricity and heat. It aims at a more diverse energy mix. According to this energy strategy the generation from hydropower shall be increased by 3.5 TWh from 2009 to 2015. Generation from Wind shall be increased by 2.8TWh. In the heat Sector fossil fuels shall be substituted by the use of waste heat and renewables, with focus on district heating and combined heat and power plants. The following list shows the instruments intended to be used for each sector:

- RES-E: Feed-in Tariffs, Subsidies, Non discriminatory Grid Access Laws
- RES-H: Grants on a federal level
- RES-T: Quota Obligation and Tax Incentives

## RES-E in Austria

Currently RES-E is governed by the "Ökostromgesetz" which regulates Feed-in tariffs and other subsidies. The main support instrument currently are feed-in tariffs, which all RES-E sources except large scale Hydro power plants are eligible for.(res-legal.eu accessed 2015) The tariffs are set in the Ökostromgesetz and depends on the technology, type of installation and the installed capacity. Table 3 shows some tariffs for units installed after 2013.

**Table 3**

| *Technology* | *Tariff* |
|---|---|
| Small Scale Hydro | 10.55 Cents/kWh (for the first 500 kWh, with declining compensation for the subsequent kWh) |
| PV (installed on top of a building) | 18.12 Cents/kWh |
| Wind | 9.45 Cents/kWh |

In addition to the FITs, Windpower, Hydropower, Biogas and Solar PV are eligible for investment grants, depending on the size of the project (Ökostromgesetz). Austria has a high deployment status of windpower, hydropower and power from biomass and low deployment status of solar PV. While the Effectiveness Indicator windpower and biomass has previously been high, and still, is (Ragwitz et. Al 20) the Effectiveness Indicator is low for Solar PV and Small Hydro. This leads to the conclusion, that the support for hydropower is insufficient to compared to the already high deployment status and that the support for PV is still not high enough, when compared with the high costs of Solar PV, although Solar PV is receiving the highest FIT.

## RES-H in Austria

Res-H is promoted by Grants and Subsidies on a Federal Level. They vary by region and can reach up to 30% of investment costs for some states and technologies. (Kranzl et. Al 2012)

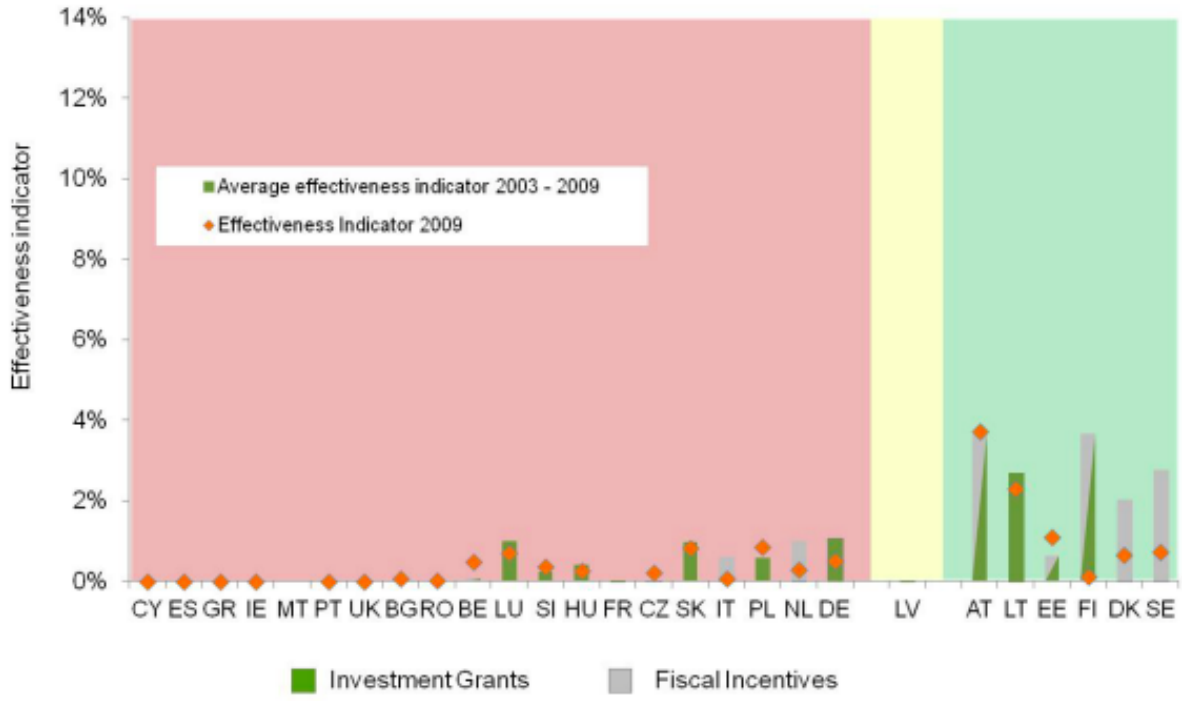


**Figure 4 Res-H Centralised Biomass Heating Plants (taken from D23)**

Austria is among the EU-27 countries with the highest deployment status and Effectiveness Idicator for centralized and decentralized Biomass heating.

## RES-T in Austria

Policies regarding RES-T are controlled by the Kraftstoffverordnung 1999, Mineralölsteuergesetz and Bioethangemischverordnung which require a quota for biofuel among regular fuel and tax incentives for fuel containing a certain amount of fuel from renewable sources. [MÖST]. This is in line with RES-T support in other EU countries and with a RES-T share of 7.7 percent ranks is on its way to reach the 2020 goal of 10%.

## Situation in Czech Republic

Czech government, published in 2004 National Energy Strategy, which outlined the future energy policies. One of the commitments in this strategy was to promote renewable energy sources and targets for RES was set at 8% of total energy consumption in 2020. After implementing European Commission Directive 2009/28 was target increased on 13%. Total real production of RES in comparison with planed production from NREAP is shown in the following chart.

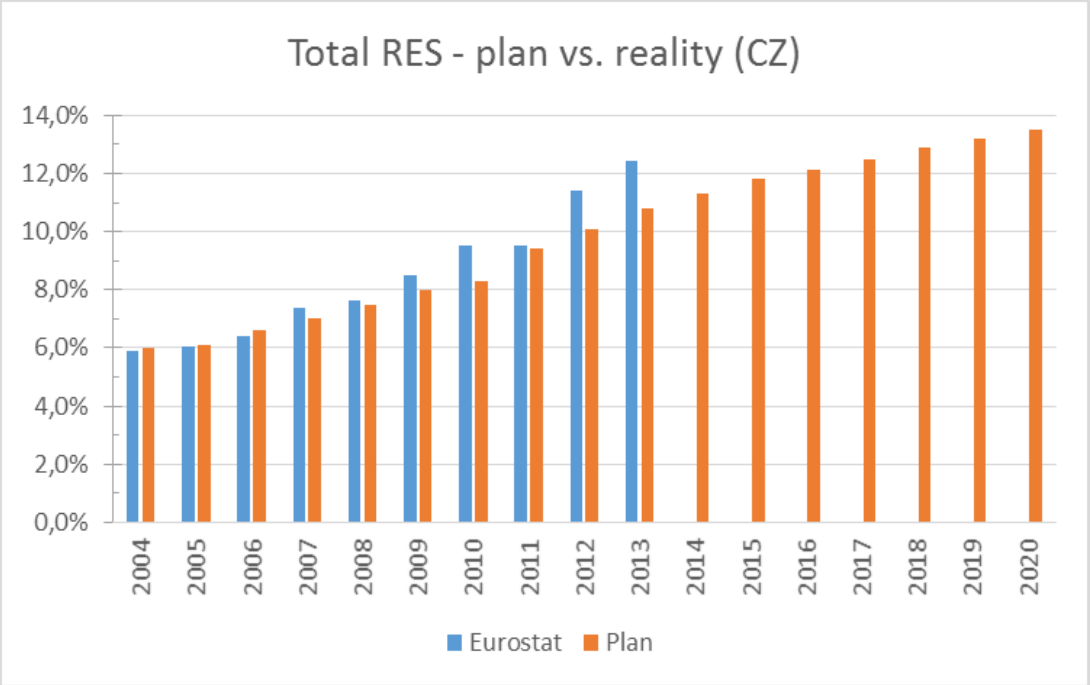


**Figure 5: Total production of RES in Czech Republic (taken from Eurostat)**

The instruments used for each sector in Czech Republic:

- RES-E: Feed-in Tariffs
  Feed-in premium (Green bonus)
  Subsidies (OPPIK)
  Non-discriminatory Grid Access and Priority connection for RES
- RES-H: Subsidies
  Tax regulation mechanism
- RES-T: Biofuel quota
  Tax regulation mechanism

## RES – E in Czech Republic

In Czech Republic is not special institution for coordination of RES-E. System is governed by the Ministry of industry and trade (MIT) and another institutions. MIT is supporting development of RES by special program OPPIK (Operational Programme for Enterprise, Innovation and Competitiveness) which is funded by the ERDF (European Regional Development Fund). Cooperating institutions are Energy Regulatory Office (which

regulates Feed-in tariffs and Green bonuses), Czech Environmental Inspectorate (CEI) and National energy inspection (NEI). The main support instrument currently are feed-in tariffs. For eligibility for support must every RES meet the requirements of the regulatory conditions (see below in 'Legislation in Czech Republic'), which depends on the technology, type of installation and the installed capacity. Following chart is presenting price development of Feed-in tariffs from year 2007 to 2015.

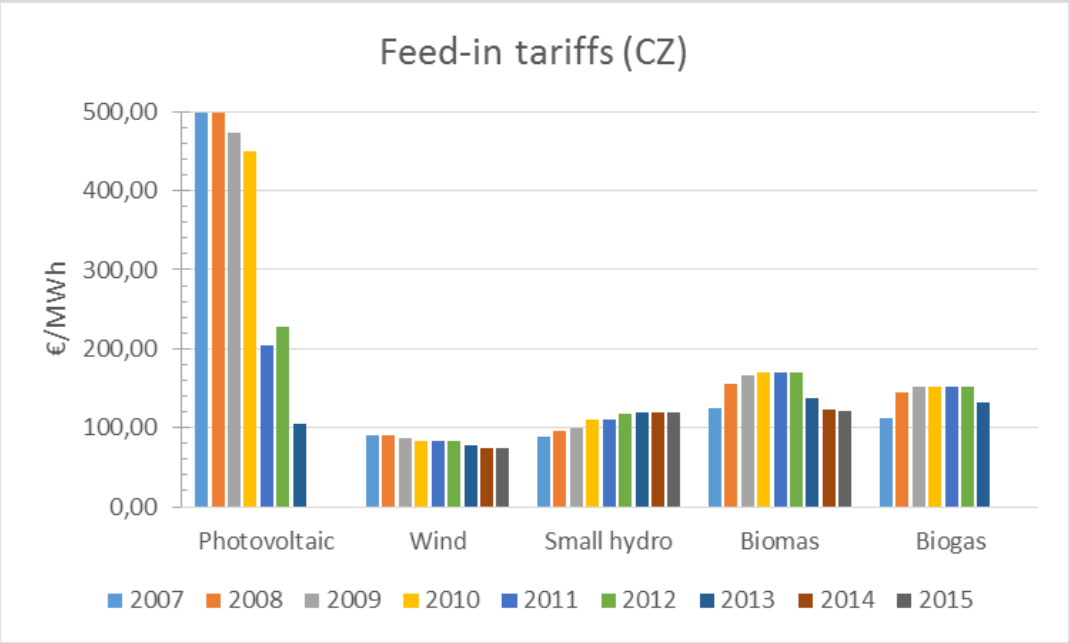


**Figure 6: Price development of Feed-in tariffs in Czech Republic (taken from ERO)**

Effectiveness Indicator for Czech Republic is one of the best in PV Solar, but one of the worst in wind energy (OnShore). Effectiveness indicator for biomass belongs to the mean values, compared to other EU countries.

## RES – H in Czech Republic

In Czech Republic are RES, used for producing heat (or cooling), promoted by Subsidies and Tax regulation mechanism. RES - H plant operators may receive subsidies for the support of renewable heat from the Operational Programmes (OP) funded by the ERDF. Ministry of the Environment is also providing funds, like "Zelená Úsporám", which is funded through auctions of emission allowances. Tax regulation mechanism is based on exemption from real estate tax, and is used for Operators of renewable heating plants.

## RES-T in Czech Republic

Promotion of RES – T in Czech Republic is based on Tax regulation mechanism and Biofuels quota. In the Czech Republic, biofuels as well as the biofuel content of mixed fuels are exempt from consumption tax. There is also an obligatory biofuel share for petrol and diesel fuel introduced on the Czech market. Regulation directs to add 6,3% of the volume in form of bio-products into diesel and 4,5% of volume into petrol. Czech Republic

is planning to reach the goal of 10,5% in 2020 (NREAP CZ). Development of RES - T from 2004 to 2013 is shown in chart below. Electricity in other modes in Figure 7 refer to use electricity in railway transport.

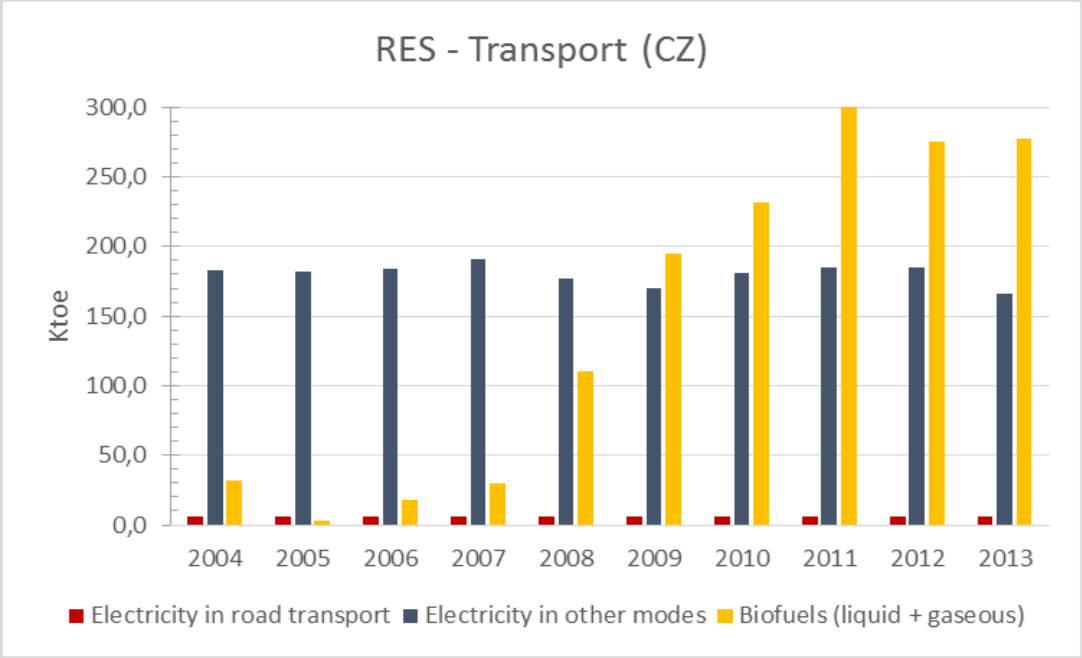


**Figure 7: Development of RES - T in Czech Republic (taken from Eurostat)**

## Legislation in Czech Republic

One of the major problem of development of renewable resources in the Czech Republic is the unstable political environment and a large amount of legislation, which is often not clearly presentable. The table below can demonstrate, how many legislative documents you need to know and understand to plan, construct and operate new renewable energy source.

A great example of malfunction of legislative environment has proven case of photovoltaic panels in 2009, which very quickly became cheaper. Authorities took almost a year to adapt to new conditions, prepare new legislation, and additionally, this new legislation (due to the instability of the government in this period) came into force in 2011. During this time in the Czech Republic was built large number of PV power plants. Due to poor quality of regulation, plants were often built in places that could be used more efficiently (for example agricultural fields instead of roofs).

**Table 4 Czech legislation associated with RES (Data gathered from NREAP)**

| | Law | Associated Regulations | Institution |
|---|---|---|---|
| Electricity | **406/2000**, Energy management Act | **195/2007**, Territorial development regulation<br>**78/2013**, Regulation on energy performance of buildings<br>**195/2001**, Local energy conception regulation | • Ministry of industry and trade (MIT)<br>• National energy inspection (NEI)<br>• Municipal authorities |
| | **165/2012,** Support of electricity production from RES Act | **436/2013**, Energy price regulation<br>**440/2012,** Specimen guarantees (and applications) origin of electricity from RES<br>**478/2012**, Reporting biomass electricity production<br>**477/2012,** Biomass specifications regulation<br>**347/2012**, The implementation of the Act | • Energy Regulatory Office (ERO)<br>• Czech Environmental Inspectorate (CEI)<br>• MIT |
| | **458/2000,** Business conditions and state administration in energy sectors act | **195/2014,** Energy price regulation<br>**541/2005**, Energy market regulation<br>**426/2005,** Regulation on licences for energy business<br>**452/2012**, State authorization for construction of selected gas equipment | • ERO<br>• MIT<br>• Municipal authorities<br>• Ministry of Regional Development (MRD) |
| Building | **183/2006**, Law on Spatial Planning and Building Regulations | **268/2009**, Technical requirements for buildings<br>**499/2006**, Construction documentation regulation<br>**501/2006**, General requirements for land use<br>**526/2006**, The implementation of the Act<br>**500/2006**, Recording planning activities regulation<br>**503/2006**, Law on the details of land management | • MRD<br>• Municipal authorities<br>• Local building office |
| | **184/2006,** Expropriation Act | | • MRD<br>• Municipal authorities |
| | **100/2001,** Environmental Impact Assessment Act | | • Ministry of the Environment (MoE)<br>• Municipal authorities |
| Other | Other laws | **114/1992**, Nature Protection Act<br>**289/1995**, Forest Act<br>**334/1992**, Act on Protection of Land Fund<br>**254/2001**, Water Act<br>**201/2012**, Air Protection Act<br>**20/1987**, Act on State Historical Preservation | • MoE<br>• CEI<br>• Municipal authorities |
| | Other regulations | Regional Acts<br>Regional development principles<br>Regional Energy Policy | |

## Conclusions

The European Union has set clear targets for the use of RES in total consumption, which further delegated to individual states, with their individual goals. Development in RES production insinuate, that the 20-20-20 target of RES in total consumption of energy in EU will be reached. At present, therefore, the EU has prepared new goals for 2030 and proposal for 2050.

Czech Republic and Austria are using a series of RES support mechanisms and in most of them matches. Both countries are using as a major support Feed-in tariffs, Subsidies provided via national agencies and Non-discrimination Grid Access. However, the differences are in the details of each mechanism through which the Effectiveness Indicator and Deployment Status for each country differs. Effectiveness Indicator for Solar PV is for example better for Czech Republic (comparing in year 2013), despite the Feed-in tariff price was higher in Austria (10,5 €cents/kWh in Czech Republic, 18,12 €cents/kWh in Austria). Therefore, the conclusion may be that not only the price level affects development of a given type of RES. Also important are the conditions under which support is granted. In Austria, the price 18.12 €cents per kWh is granted only for rooftop installations, while in the Czech Republic is the price guaranteed to all PV sources. Big role in development of RES must be seen also in quality of institutions, which are providing support, or regulation. Problems can be in inflexible manner of the functioning in certain institutions, especially in the Czech Republic.

It is therefore almost impossible to say which support system is the best one and it's not possible to simply adjust the support scheme for all the countries in the European Union as well.

In general, we can assume, that the development of RES will continue, regardless of the support system. Share of renewables will rise not only in the Czech Republic, Austria or the EU, but worldwide. Reaching the goals, set by EU, may seem expensive, but high dependency on imported fossil fuels and rising prices, combined with declining production of fossil fuels and increasing demands for climate protection, are making this price tenable.

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