

POLICY PAPER

Renewable energy potential in the Czech Republic: Obstacles to achieve it

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- **The sun doesn't always shine and the wind doesn't always blow. Yet, the number of countries using renewable energy to cover substantial parts of their energy needs continues to rise every year.**
- **In the Czech Republic, however, the growth has been stagnating. What is holding Czech RES back? What is the country's potential for solar, wind, hydro and other renewable sources? Where should we seek inspiration for development?**



Introduction

Nowadays, most of Czech electricity is produced in domestic brown coal power stations, which supply almost 50%. Another source is nuclear reactors at the Temelín and Dukovany power stations, which supply about 35%. The rest is covered by renewable sources.

In 2016, most of the electricity from renewables in the Czech Republic was produced by biogas. Gross production from this source was 2.6 TWh. Solar power plants followed with 2.13 TWh and biomass with 2.07 TWh. The smallest share (0.1 TWh), despite the year-on-year growth of almost 14 percent, was made from biodegradable municipal waste.¹

Sun – photovoltaic boom & legislative chaos

The installed capacity of photovoltaic power plants (2100 MW) is currently growing the fastest of all the electricity sources. With the decreasing price of solar panels and the growth of electricity storage options, the expectations of their share in the energy mix are high. It has the potential to reach 5500 MW in 2030. However, current energy storage technologies are still heavily constraining the possibilities of using photovoltaics.²

Boom of installation of photovoltaic systems occurred in 2009 and 2010 due to an unmanaged subsidized price system. It was set up in such a way that it did not allow for a quick and simple reduction in the amount of subsidized feed-in prices at a rapid reduction in panel prices at that time. In those years, the installed capacity of photovoltaic power plants in the Czech Republic has increased to nearly 2000 MWp. At that time, almost all photovoltaic farms with a capacity of more than 5 MWp were built. The three largest are Ralsko RA 1 with a capacity of 38.3 MWp, Vepřek with

a capacity of 35.1 MWp and Ševětín with a capacity of 29.9 MWp.³

This development led to significant increase in the costs of RES support, thus a number of restrictive measures were adopted in the following years. Unfortunately, this had a strong impact not only on the development of photovoltaics but it caused a stagnation of the RES industry in the Czech Republic as a whole.

Nowadays, only small, decentralized PV sources on buildings are installed due to the abolition of the guaranteed prices. These sources are not primarily intended for the supply of electricity to the grid. While small installations up to 30 kWp account for 92% of the total number of devices, their performance is only 12% of the 2 GWp.⁴

If weather conditions are good, Czech installed photovoltaic power plants cover quite a part of the daily peak consumption from spring to autumn. Generally, photovoltaic power plants in the country currently generate around 2.1 TWh per year, representing about 2.5% of the country's production.

The already very high installed capacity in Germany (40 GWp) – and most notably in the neighbouring Bavaria (11 GWp) – competes on the market with electricity from Czech PV installations: as the sun shines rather similarly in Czechia and in Germany, in the case of ideal conditions the market is flooded with surplus of German solar electricity.

However, there is still considerable space for increasing photovoltaics in the Czech Republic. The priority should be given to decentralized installations and to buildings. According to ENACO report, the residential and family houses have potential of about 4.5 GWp, and potential of other buildings is up to 7.3 GWp.⁵ The real potential is unfortunately still limited and a breakthrough in energy storage would help to unlock it.

¹ <https://oze.tzb-info.cz/121264-zelena-elektrina-se-nalonske-spotrebe-v-cr-podilela-13-procenty>

² <http://oenergetice.cz/obnovitelne-zdroje/potencial-vyuziti-fotovoltaickych-zdroju-cr-ve-svete-dil-1/>

³ <http://oenergetice.cz/obnovitelne-zdroje/potencial-vyuziti-fotovoltaickych-zdroju-cr-ve-svete-dil-2/>

⁴ <http://oenergetice.cz/obnovitelne-zdroje/potencial-vyuziti-fotovoltaickych-zdroju-cr-ve-svete-dil-2/>

⁵ <http://www.alies.cz/wp-content/uploads/Potencial-solarni-energetiky-v-CR.pdf> J. Jakubes a V. Járka: Studie „Potenciál solární energetiky v České republice“, firma ENACO pro Českou fotovoltaickou průmyslovou asociaci

Since adopting the legislation on the support for renewable energy in 2005, the Czech government has had a non-conceptual approach and has failed to respond to the dynamic developments of photovoltaics (removing problematic limits to year-on-year changes in the purchase price, retroactive measures in relation to already implemented projects, etc.). Solar energy was also harmed by a negative campaign against investors in this field. These trends have led to a stagnation of further use of solar power in the Czech Republic.⁶

Wind – geographic conditions & reluctance of public

Current capacity of wind energy in the Czech Republic is 278 MW. However, its potential for 2030 is much higher. An analysis of the Chamber of RES shows that, in the future, wind power plants in the Czech Republic could cover one third of the electricity consumption. Nowadays, it is 0.7% of consumption.⁷

The realizable potential of wind power in the Czech Republic is, according to the study of the Institute of Atmospheric Physics of the Academy of Sciences of the Czech Republic, up to 2,300 MW of installed capacity with an anticipated annual production of 5.9 TWh of electricity. The study is based on wind conditions in the Czech Republic, excluding protected areas, national parks, bird reserves and other sensitive localities and areas. However, some unjustified initiatives by certain regions, such as the general ban on wind farms in the whole Vysočina region, have to be overcome.⁸ In addition, favourable wind conditions are mostly in the mountains and protected natural areas.⁹

Another limiting factor to the use of wind energy in the Czech Republic is the high installed capacity in neighbouring Germany. When there are large surpluses of wind power, the price on the electricity market drops very low. Our installations can hardly compete with farms built on the windy coast in northern Germany. Each wind power installation in our country that will supply electricity to the grid has to deal with this problem. Advantageous devices will be only decentralized installations covering local requirements.

These reasons, particularly the reluctance of the population and local authorities, and the abolition of subsidies to electricity prices from wind power plants, have stopped the construction of new installations and the stabilization of total power in recent years at the level of about 280 MW.¹⁰

Bavaria which is similar to the Czech Republic (geography, high density of population, and an industrial character) is the most interesting example and case study for Czechia. At the end of 2016, there were more than a thousand turbines with a capacity of 2.2 GW in this German state. In 2016, 124 new turbines with a capacity of around 340 MW were installed.

In Bavaria, wind conditions are worse than in the north of Germany. In addition, there is a high population density and relatively strong reluctance towards construction of wind farms – similarly to the Czech Republic. This has led to the adoption of the so-called 10H law, which requires wind turbines to maintain a minimum distance of at least ten times their height away from residential buildings. Such a rule radically reduced the number of possible construction places. Nevertheless, wind turbines in Bavaria cover about 4% of the total electricity demand.¹¹

⁶ <http://www.alies.cz/wp-content/uploads/Potencial-solarni-energetiky-v-CR.pdf> J. Jakubes a V. Járka: Studie „Potenciál solární energetiky v České republice“, firma ENACO pro Českou fotovoltaickou průmyslovou asociaci

⁷ http://hnutiduha.cz/sites/default/files/publikace/2015/03/analiza_vetrne_energetiky.pdf

⁸ <http://oenergetice.cz/vetrne-elektrarny/vetrne-elektrarny-vcera-dnes-zitra-dil-2/>

⁹ <https://euractiv.cz/section/aktualne-v-eu/news/obnovitelne-zdroje-zlevnuji-v-eu-by-se-z-nich-brzy-mohla-vyrbet-polovina-elektriny/>

¹⁰ <http://oenergetice.cz/vetrne-elektrarny/vetrne-elektrarny-vcera-dnes-zitra-dil-2/>

¹¹ <http://oenergetice.cz/vetrne-elektrarny/vetrne-elektrarny-vcera-dnes-zitra-dil-2/>

On the Czech side, the implementation of new wind power projects continues to be restrained by the unstable legislative environment, the negative attitudes of the authorities and a lengthy authorization procedure, the negative attitudes of public and certain politicians and, paradoxically, the attitude of some civic associations with ecological focus.¹²

Biogas – odour & insufficient knowledge

Current installed capacity of biogas is 332 MW, while its potential is 485 MW in 2030. However, due to citizens' complaints, some biogas stations had to stop functioning because of the odour. Some civic associations have since fought against the construction of other biogas stations. The activities of these associations were successful in various cases and a number of community-based investment projects were not realized (Úholičky u Prahy, Tišnov).¹³

However, this was caused by insufficient knowledge of the fermentation process and the operators' inexperience – errors in choosing technology with regard to the processed substrates, errors in project design, and enormous efforts to save money on investment and operating costs leading to the breach of technological discipline. As a result of these errors, operational problems emerged, resulting in reduction of performance and odour production.¹⁴

The main obstacle – legislative environment

As we have seen, there are various obstacles to utilization of the full potential of renewable energy sources in the Czech Republic: geographic conditions, public

reluctance towards RES, high competition on the electricity market, etc. However, the biggest challenge is the Czech legislative environment. According to ENACO report, the key factors¹⁵ that have contributed to the current state of the use of RES in the Czech Republic are:

- Low flexibility of the state in setting the conditions for operating support for renewable energy sources (or absence of binding performance ceilings), resulting in a rapid development especially in photovoltaic installations in 2009 and 2010.
- Overlapping of operating and investment support in the area of biogas use, which has significantly stimulated development, but in many cases has resulted in inefficient projects – both energy- and economy-wise.
- Subsequent restrictive measures against existing and new RES sources after 2010 – the "stop state" for the connection of new sources in 2010-2012.
- Massive media campaigns against photovoltaics and RES in general.
- Considerably restrictive legislative proposals (re-evaluation of the payback period, subsidization of the aid).
- Repetitive legislative changes.
- Unresolved and non-functional system for the support of heat production from RES, which did not sufficiently stimulate the development of the market (especially the use of biomass).
- Negative attitude of local and regional authorities to renewable sources with high potential, especially to wind power plants and biogas stations.
- Administrative barriers for so-called "micro-sources" and for the production of electricity from RES for own consumption.

¹² <https://oze.tzb-info.cz/vetrna-energie/17248-inventura-vetrne-energetiky-v-evrope-a-ve-svete-v-roce-2017>

¹³ https://www.mpo-efekt.cz/upload/7799f3fd595eeee1fa66875530f33e8a/Biopllyn_sesit.pdf

¹⁴ https://www.mpo-efekt.cz/upload/7799f3fd595eeee1fa66875530f33e8a/Biopllyn_sesit.pdf

¹⁵ <http://www.alies.cz/wp-content/uploads/Potencial-solarni-energetiky-v-CR.pdf> J. Jakubes a V. Járka: Studie „Potenciál solární energetiky v České republice“, firma ENACO pro Českou fotovoltaickou průmyslovou asociaci

- State hesitation and indecision in the way how to support the use of RES, and in the question of environmental tax reform.

The development of RES in the Czech Republic's energy mix in the recent years has been significantly affected by the non-conceptual approach and the low flexibility of the state – mainly in the setting of legislation and parameters for RES support.

This instability of the legislative environment negatively influences the use of full potential of renewable sources in the Czech Republic.

Prague Climate Talks is a new project aimed at establishing a platform for continued high-level discussion on the complex issue of climate change. Throughout a series of debates it will bring together experts and professionals from varying relevant fields as well as members of the general public.

The project is co-organised by **EUROPEUM Institute for European Policy** and **Glopolis** in cooperation with **Heinrich-Böll-Stiftung Prague** and under the auspices of the **UN Information Centre Prague**.

Recommendations

According to Hnutí Duha,¹⁶ recommendations could be the following:

- Restoring operational support for new wind farms partly owned by surrounding communities and their citizens. According to the European Union, wind power plants of up to 3 MW and six pieces can continue to be supported by green bonuses. Just like other countries, the Czech Republic should use this opportunity.
- Guarantee of conditions for owners of roof photovoltaic power plants should not be discriminatory, and a stable electricity payment system should be created. Furthermore, investment support for photovoltaics for households and municipal buildings should continue.

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¹⁶ http://www.hnutiduha.cz/sites/default/files/publikace/2017/11/infolist_o_komunitnich_obnovitelnych_zdrojich.pdf