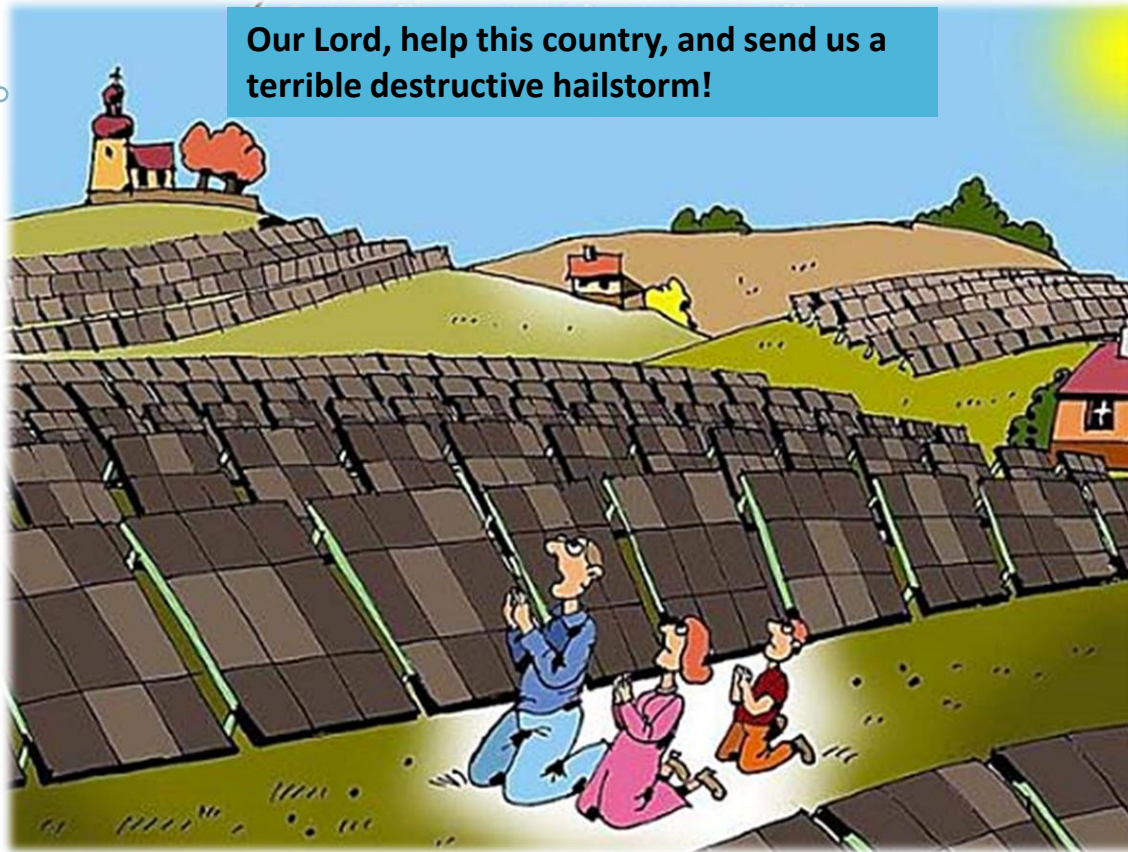


Case study: Czech experience with RES development



Our Lord, help this country, and send us a terrible destructive hailstorm!



MINISTERSTVO ŠKOLSTVÍ,
MLÁDEŽE A TĚLOVÝCHOVY



OP Vzdělávání
pro konkurenceschopnost



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INVESTICE
DO ROZVOJE
VZDĚLÁVÁNÍ

CZECH EXPERIENCE WITH RENEWABLES DEVELOPMENT

| Obligations Resulting from the Membership in International Organizations | |
|---|--|
| Obligation | Obligation as Amended by |
| Reduction in greenhouse gas emissions by 8 % by 2012. | Kyoto Protocol |
| A greater renewable energy share in gross final consumption, reaching the level of 8 % by 2010 and the level of 15 % by 2030. | EU Accession Agreement (Athens, April 16, 2003) |
| A greater renewable energy share in gross final consumption, reaching the level of 13 % by 2020. | Directive of the European Parliament and of the Council 2009/28/EC |
| Reaching a renewable energy share of 10 % in all sorts of transportation displayed on gross final energy consumption in transportation in the Czech Republic by 2020. | Directive of the European Parliament and of the Council 2009/28/EC |
| Emissions from the sectors not covered by the EU ETS will not exceed 2005 levels increased by 9 % by 2020. | EU Climate and Energy Package |
| Source: T. Vlček from publicly available sources | |

CZECH EXPERIENCE WITH RENEWABLES DEVELOPMENT

- Act No. 180/2005 Coll. pioneered the term '**green bonus**', indicating "the financial amount increasing the market price of electricity that is paid by the operator of the regional grid system or the operator of the transmission system to the producer of electricity from renewable sources, taking account of reduced damage to the environment resulting from use of a renewable source compared to combustion of fossil fuels, of the type and size of the production plant and of the quality of electricity supplied"
- It obliges the operators of the regional distribution systems and the operators of the transmission system "to **purchase all electricity from renewable sources** eligible for promotion and to conclude a supply contract, if a producer has offered electricity from renewable sources".
- „*Assumption of responsibility for deviation pursuant to special regulation*” is of extreme importance as well, as the responsibility was put on CEPS for **maintaining the stability** of the network in the event of unstable production of electricity from renewables.


Tab. 7.4: Scenario of Renewable Energy Share in Final Energy Consumption According to the National Renewable Energy Action Plan of the Czech Republic

| | | | | | | | | |
|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
| Share (%) | 6.1 | 6.2 | 7.0 | 7.0 | 7.4 | 8.3 | <i>9.4</i> | <i>10.1</i> |
| Year | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
| Share (%) | <i>10.8</i> | <i>11.3</i> | <i>11.8</i> | <i>12.1</i> | <i>12.5</i> | <i>12.9</i> | <i>13.2</i> | <i>13.5</i> |

Note: data in italics are figures planned according to the Scenario, while other figures represent actual levels.

Source: The Ministry of Industry and Trade, 2010d, p. 88.

- The system of state promotion of renewables was set so generously that, for example, the target of 1,695 MWe of installed capacity in photovoltaic power plants, which the Czech National Renewable Energy Action Plan set for 2020, has been exceeded already in 2010.
- The cause of this boom lies in a combination of reduction of investment costs in photovoltaic and wind power plants construction on one hand and excessively high preferential treatment through state support on the other hand, which led to a significant development of the renewable sector and proliferation of companies engaged in installation of domestic and industrial power plants.
- While in 2005 the purchase price of electricity from photovoltaic power plants was 6.04 CZK/kWh, the Energy Regulatory Office more than doubled this value in 2006, to 13.2 CZK/kWh (which is about twelve times the market price of electricity)

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- An originally well-planned program was supposed to motivate citizens to accept renewables, to bring them to trust in their potential and also to increase renewable energy share in total production and consumption of electricity in the Czech Republic, in order to accomplish the required commitments resulting from international agreements.
 - In reality, however, the citizens and industry sector identified the opportunity and prospect of easily obtainable and guaranteed state money in the course of several years, while photovoltaic plants, consequently, experienced an incredible expansion.
 - Not even the Energy Regulatory Office was capable to manage the situation, since the law allowed it to lower a purchase price of electricity from renewables by maximum 5 % per year.

Tab. 7.8: Installed Capacity of Photovoltaic Power Plants in the Czech Electrification System

| Year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|----------------|------|------|------|------|------|-------|----------|---------|---------|
| Inst. capacity | 0.13 | 0.13 | 0.74 | 3.4 | 54 | 464.4 | 1,959.10 | 1,971.0 | 2,086.0 |

Note: data always as of December 31. Installed capacity indicated in MWe.

Source: Energetický regulační úřad.


- It is clear that it was impossible to react on this unexpected and unanticipated development of photovoltaic (and wind) power plants in a timely manner by developing the technical base of electrification system.
- The „Renewable Energy Crisis“ was de facto triggered by the mentioned discrepancy and it erupted on February 16, 2010, when the companies CEZ Distribuce, a. s. and E.ON Distribuce, a. s. met the request of CEPS, a. s. and stopped with the approval of applications for installation of new photovoltaic and wind power plants into the network.
- The stop of approvals lasted until September 2011, and than again from January 2012 until the end of the year in Southern Bohemia and Southern Moravia.


Renewables

Total Expenditures for Photovoltaic and Wind Power Plants in the Czech Electrification System in the Period 2010 – 2030


| Gross Costs | In Total 2010 – 2030 (mil. of CZK) | Share of Total (%) |
|---|---------------------------------------|-----------------------|
| Direct costs of electricity purchased in photovoltaic power plant | 509,916 | 72.6 |
| Direct costs of electricity purchased in wind power plant | 44,836 | 6.4 |
| Costs of the provision of sufficient PpS | 48,948 | 7.0 |
| Costs of induced investments | 18,035 | 2.6 |
| Costs of additional regulatory energy | 80,380 | 11.4 |
| In Total | 702,116 | 100 |

Source: Zajíček, 2010, p. 66; modified by T. Vlček.

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- In November 2010, Amendment No. 330/2010 Coll. and, in December 2010, Amendment No. 402/2010 Coll. to Act No. 180/2005 Coll., on the promotion of electricity production from renewable energy sources and amending certain acts, were passed and entered into force on March 1, 2011.
 - state would from now on support only those photovoltaic power plants connected to the distribution network
 - So called solar farms will be also cut of support, whereas the state support will go only to the photovoltaic power plants placed on roofs and buildings with installed capacity of no more than 30 kWp
 - So called retroactive solar tax of 26-28% was introduced for all photovoltaic facilities launched in 2009 and 2010
 - In 2011, a purchase price of electricity from renewables was set on 7.5 CZK/kWh.

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- These amendments were understood as a temporary solution
 - A new act entered into force on January 1, 2013, as Act No. 165/2012 Coll. on supported energy sources
 - The Act was closely tied to Directive 2009/28/EC.
 - According to the National Renewable Energy Action Plan, the connection of renewables into the network will be, from now on, capped with a yearly deliberate capacity.
 - Even though Directive 2009/28/EC understands the levels of the National Action Plan as minimum, the new Act No. 165/2012 Coll. understands them as maximum.
 - These caps are, according to the National Action Plan, calculated every year not only for the entire Czech Republic, but for single regions as well. Should they reach the upper limit, no further connection approvals would be granted until the following year.
 - Support of photovoltaic power plants is recently limited to the production capacity of less than 30 kWp that is located on the roof or perimeter wall of one building attached to the ground via firm foundations registered in the real estate registry.



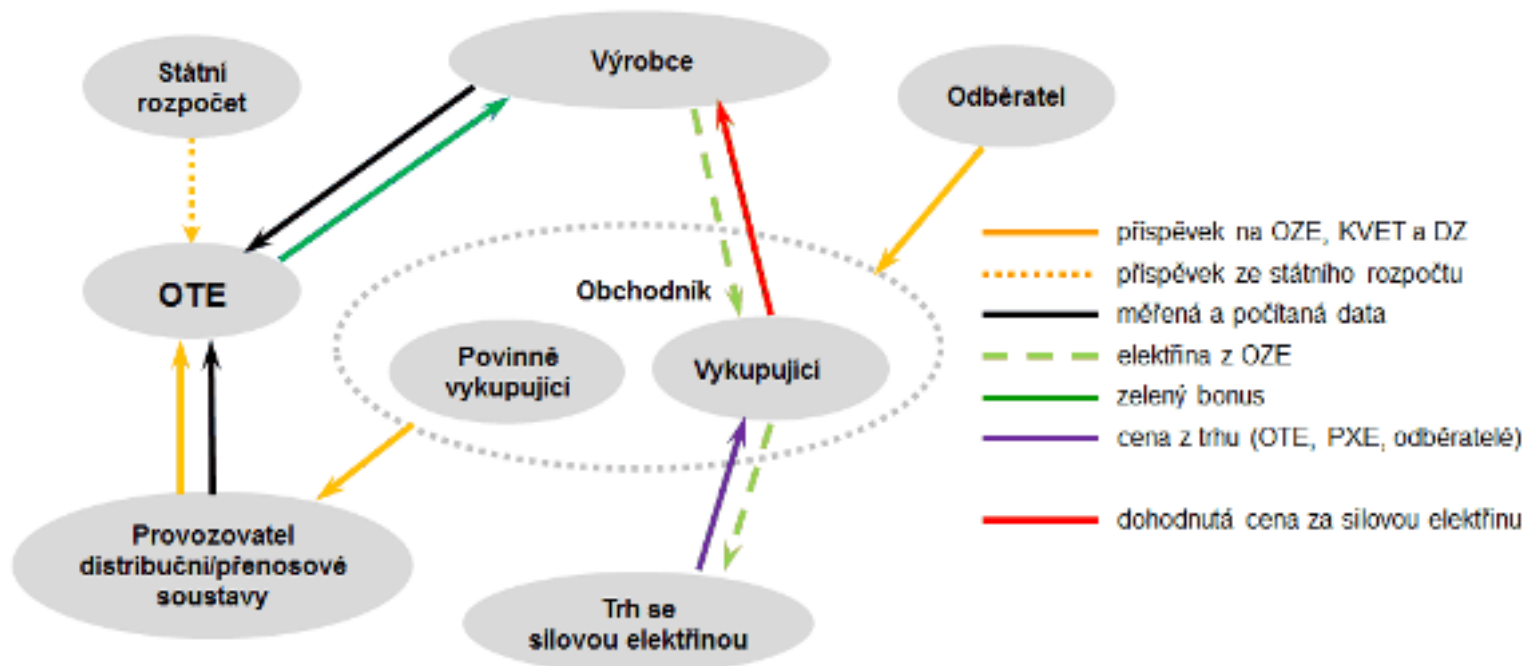
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- The amendments and the new act contributed to the stabilization of the renewable sector.
 - The price to be paid is, naturally, high. A rough suspension of the sector and a significant change of terms led to the bankruptcy of tens of companies trading with photovoltaic technologies, while the state is financially burdened with support to decentralized production and renewables for the next tens of years.
 - Renewables were depreciated in the public eyes to a great measure and the likelihood that the obligation of a 13 % renewable energy share in gross final energy consumption by 2020 will be accomplished is very low.
 - In 2004, production of electricity from renewables reached the figure of 2.61 TWh and a 3.80 % share in consumption.
 - In 2012, production of electricity from renewables amounted to 8.06 TWh, while the share in consumption was 11.43 %.
 - In this relation, it depends on the point of view whether we really speak of positives figures.

Price of electricity

- Why this boom affects the overall price of electricity?

| Share of price components for electricity supply to households in 2010 and 2014 | | |
|--|----------------|---------------|
| Electricity incl. margin | 42,27 % | 30 % |
| Market operator | 0,12 % | 0,2 % |
| System services of ČEPS | 3,94 % | 2 % |
| Renewables, cogeneration and decentralized sources | 4,41 % | 10 % |
| Electricity distribution and transport | 31,86 % | 40,2 % |
| Ecological tax | 0,72 % | 0,6 % |
| VAT | 16,67 % | 17 % |
| Source: Energetický regulační úřad | | |

Price of electricity



Renewable Energy Policies

The development of contribution to the RES, CHEP and DS for end consumers

| Year | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|-------------------------------|-------|--------|--------|--------|--------|--------|--------|--------|
| Contribution in CZK per 1 MWh | 52,18 | 166,34 | 370,00 | 419,22 | 583,00 | 495,00 | 495,00 | 495,00 |

Renewable Energy Policies

- 26.7.2013 – approval of the key amendment of the current law on renewable energy sources
- Content:
- 1) capping the contribution to RES at 495 CZK / 1 MWh (positive effect on competitiveness)
- 2) end of support for new sources and distributed generation of electricity (biomass, bioliquids and biomethane, solar power, biogas stations) from 1. 1. 2014
- Support stopped since 1. 1. 2015 also to installations that had authorization to be build at the time the act entered into force
- 3) end of the aid will not cover high-efficiency combined heat and power production, secondary sources of energy, and the heat produced from renewable sources

Further amendments: 131/2015 Sb., 107/2016 Sb., 190/2016 Sb., 103/2017 Sb., 183/2017 Sb.

Renewable Energy Policies

- In the current centralized arrangement of electricity (and heat production) in the Czech Republic, RES can never be more than just complementary
- Rearranging of the system would of course lead to changing the potential use of RES
- Renewable energy sources are and will be in the Czech Republic for a long time only supplementak sources, their development has been artificially and rudely stopped
- It should be rigorously separated the different types of renewable energy sources, because each has different characteristics in terms of production, distribution, resource base, networking, etc.
- This fact can not be viewed quite negatively
 - sharply dialectical nature of the current energy sector aims to increase the use of renewable energy sources
 - attention should be given to headlessness and irrational support (biomass)
 - we should target areas where the resource base is almost for free (eg. waste)
 - we should support and conceptually and rationally develop projects based on geographic and national specifics of appropriate conditions and those that have future potential