

CZ-AT Winter and Summer School, 2013

RES-E Support Scheme in the Czech Republic

*Past, present and future of the
Energy Policy*



Jaroslav Knápek

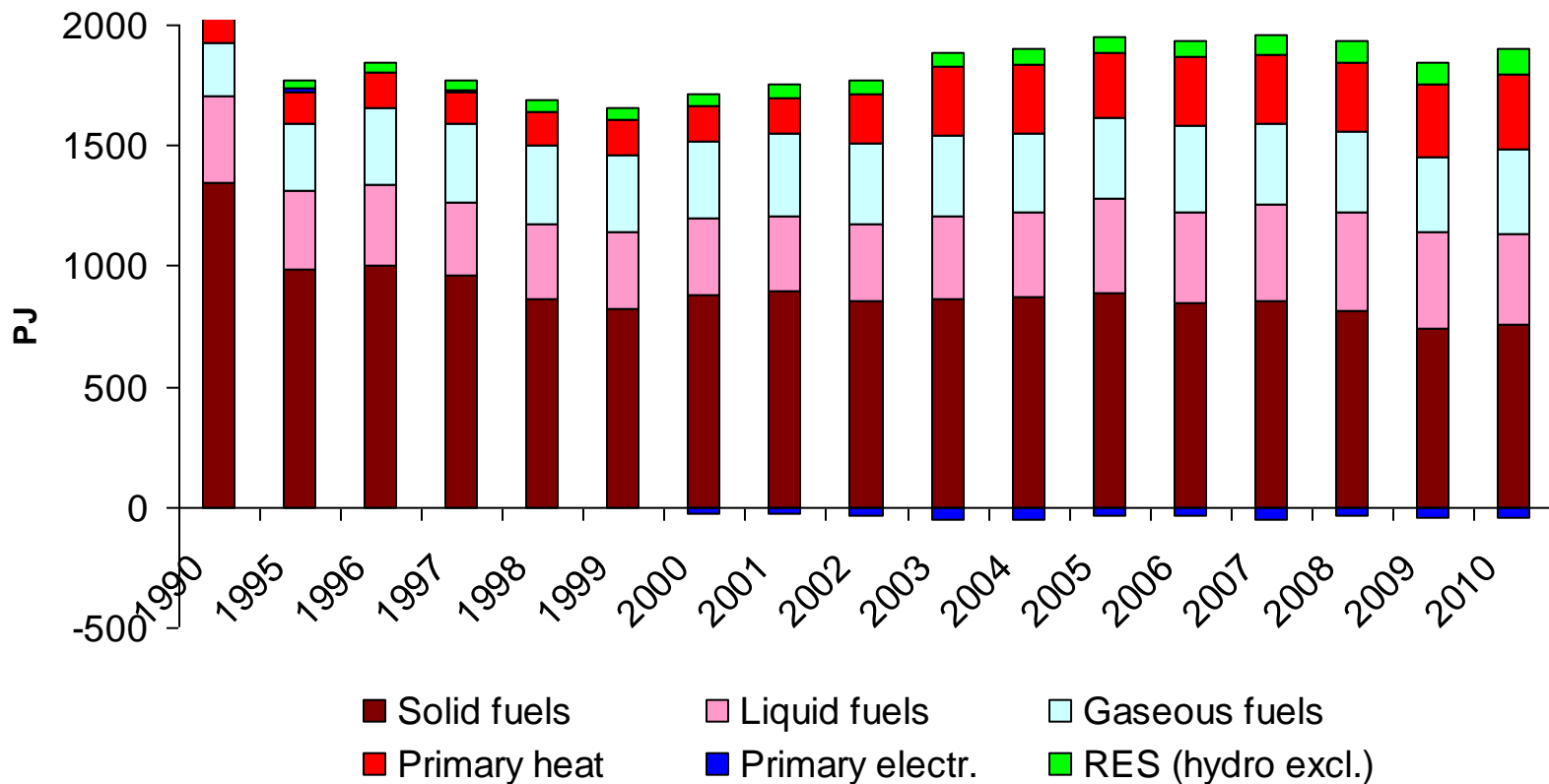
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Content

- PES statistics – development and current state
- RES statistics – development and current state
- State Energy Policy
- From history of RES support
- Current state and changes since 2013

Primary energy sources - development



Continuously decreasing share of solid fuels

1990: 65 %, 2005: 46,5 %, 2010: 40,5%

Note: Primary electricity: Hydro +(import-export)

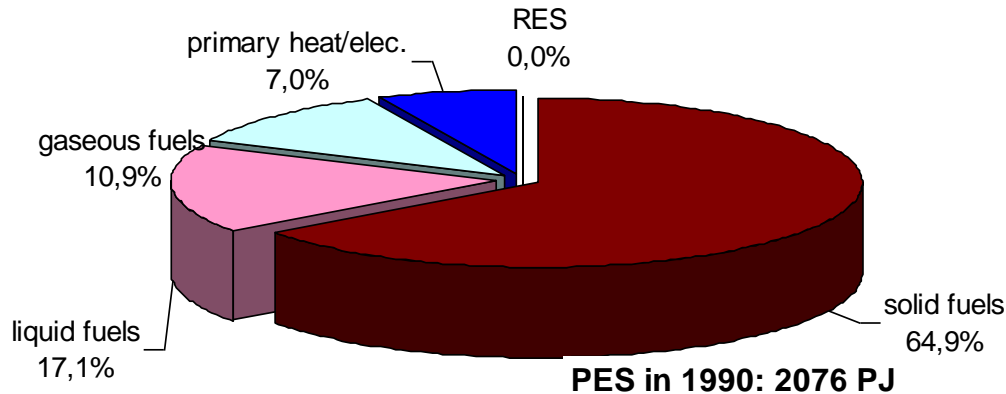
PES 1990: 2076 PJ 1995: 1711 PJ

PES 2005: 1914 PJ 2007: 1902 PJ

PES 2009: 1807 PJ 2010: 1861 PJ

Primary energy sources - development

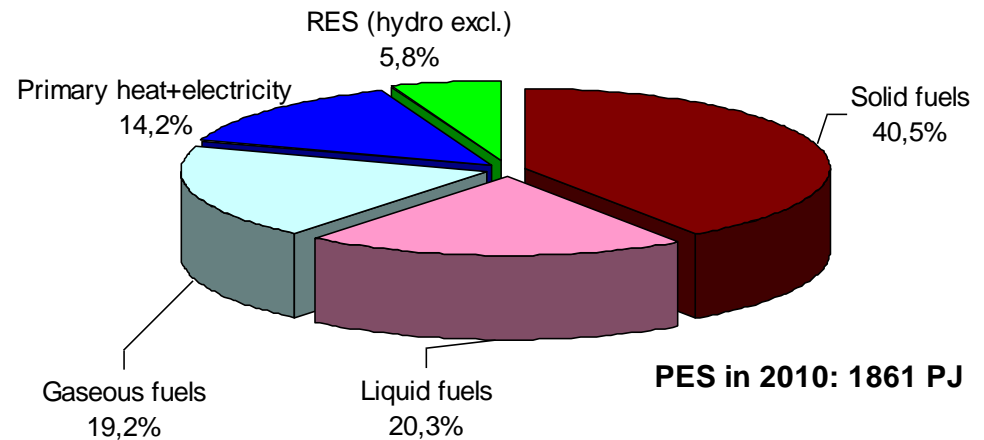
PES structure in 1990



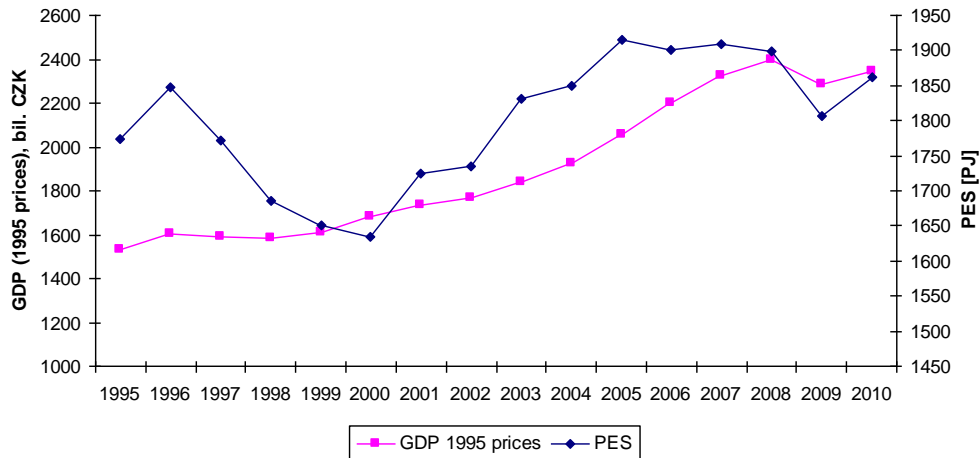
Solid fuels still dominates in PES structure – much higher share than in EU15 (EU average)

- Results e.g. in higher specific CO₂ emission (per capita)

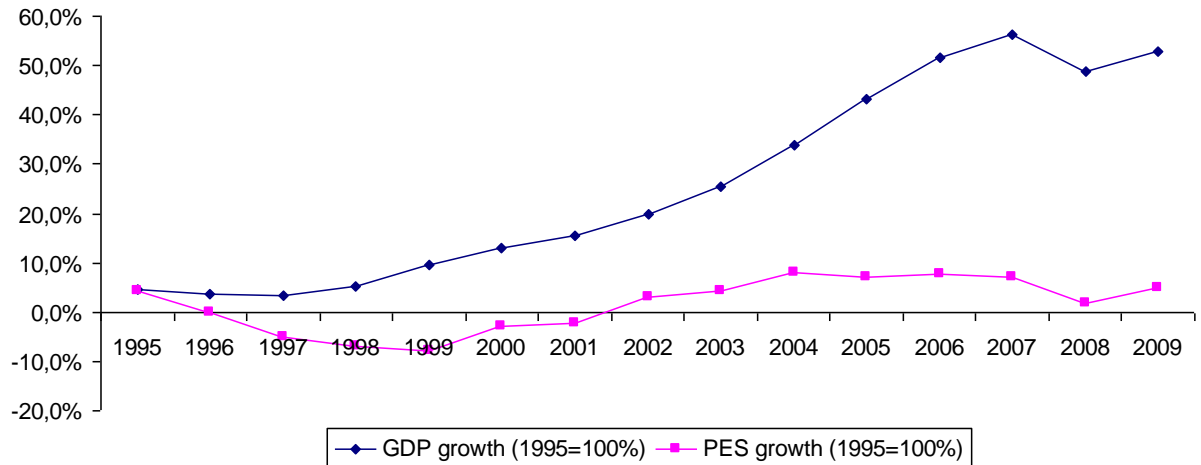
PES structure in 2010



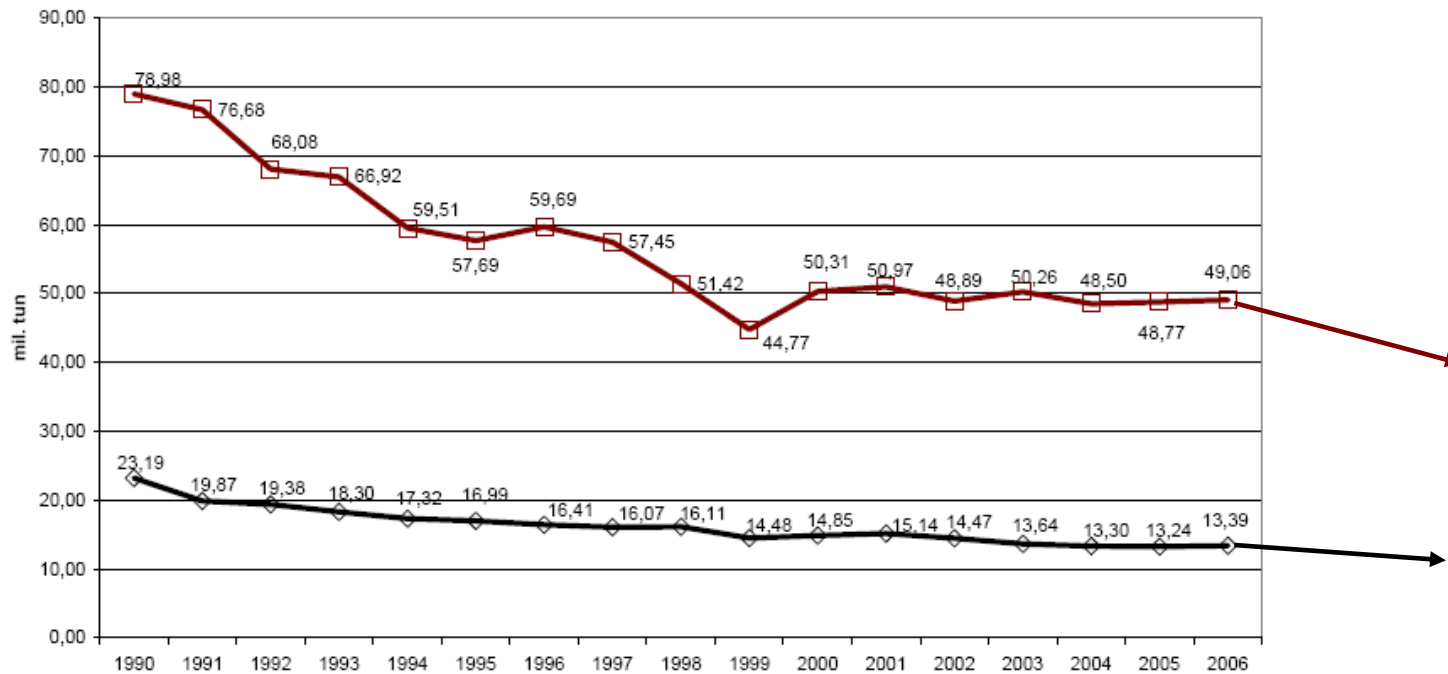
PES and GDP development



Growth of GDP separated from PES consumption



Domestic coal – continuously decreasing role



Domestic brown coal is becoming the „scarce“ resource

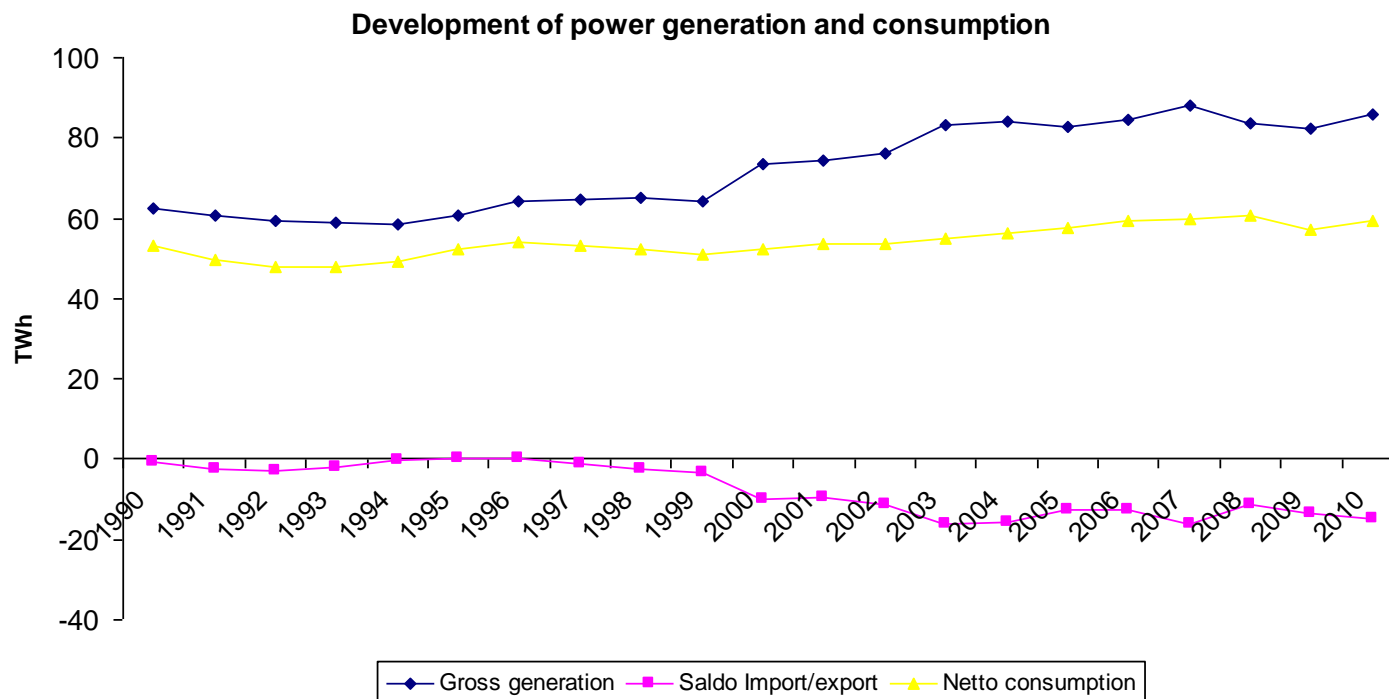
But reduction mainly caused by increasing power generation in nuclear and RES PP

2010: Hard coal 11,4 mil t, Brown coal: 43,8 mil. t

2008: Hard coal 12,6 mil t, Brown coal: 47,1 mil. t

Hard coal 2010: 7,8 mil. t domestic consumption

Czech Rep. is the important power exporter



2007: Gross gen.: 88,2 TWh, Imp./export: -16,2 TWh, Netto consumption: 59,7 TWh

2010: Gross gen.: 85,9 TWh, Imp./export: -14,9 TWh, Netto consumption: 59,2 TWh

2011: Gross gen.: 87,6 TWh, Imp./export: **-17,0 TWh**, Netto consumption: 58,6 TWh

Czech Rep. is the important power exporter

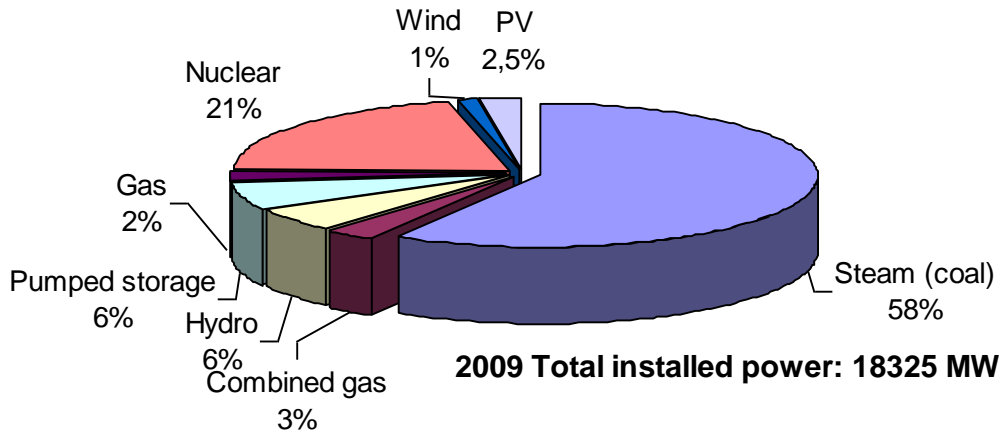
Electricity imports and exports as measured 2000 and 2010 (GWh)

Country	2000	2001	2002 ¹⁾	2003 ¹⁾	2004 ¹⁾	2005 ¹⁾	2006 ¹⁾	2007 ¹⁾	2008 ¹⁾	2009 ¹⁾	2010 ¹⁾
b	6	7	8	9	10	11	12	13	14	14	15
Import from Germany	231	198									
from Poland	7220	7814	8354	9428	9071	11090	10086	9198	6841	7095	5354
from Austria	2	2							0	0	0
from Slovakia	1272	1208		2	1	25	40	0	0	0	0
Others	0	158	1148	656	704	1236	1340	1006	1679	1491	1288
Total import	8725	9380	9502	10086	9776	12351	11466	10204	8520	8586	6642
Export to Germany	8932	9261	10358	12740	12973	12614	11405	8533	6613	7721	8834
to Poland	64	61		3			101	1	1	0	0
to Austria	5481	5729	5937	7628	6238	6105	6116	6950	6449	6599	6292
to Slovakia	4265	3710	3435	5275	5578	5030	5195	9877	5279	6425	5140
Others	0	158	1159	653	704	1236	1280	996	1647	1485	1324
Total export	18742	18919	20889	26299	25493	24985	24097	26357	19989	22230	21590
Balance of foreign exchange	-10017	-9539	-11387	-16213	-15717	-12634	-12631	-16153	-11469	-13644	-14948

-17 TWh in 2011

Source: CZSO, 1) Imports and Exports by countries only transmission lines 220 kV and 400 KV

Structure of installed power

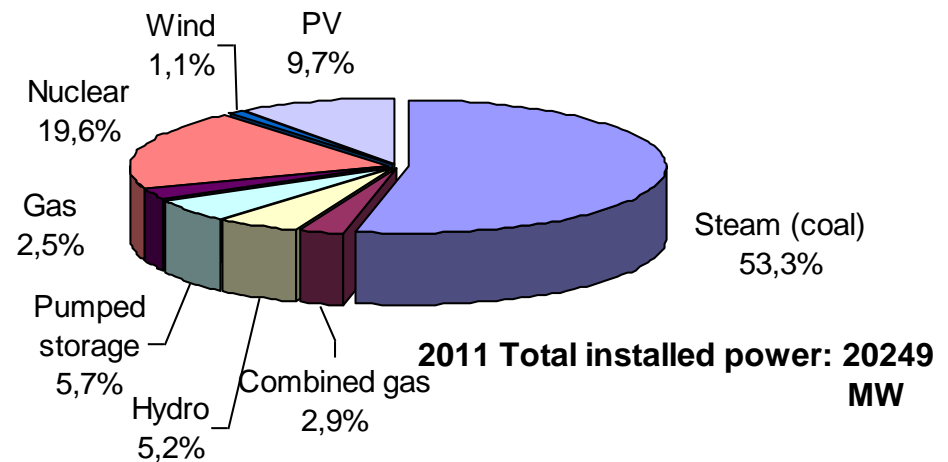


Currently existing coal fired PP will finish operation in 2015-2020(5)

Only a part of installed power will substituted with modern coal block

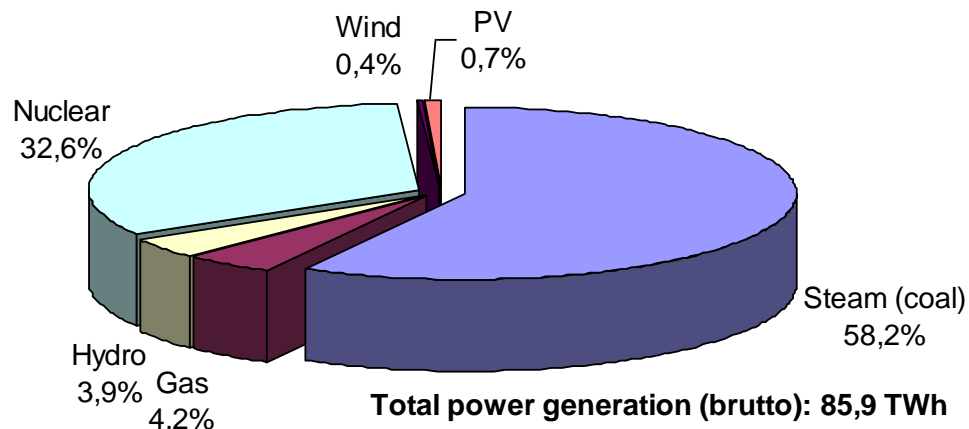
New capacities only in RES and cogeneration !

2013: launch of 880 MW CCGT in Počerady

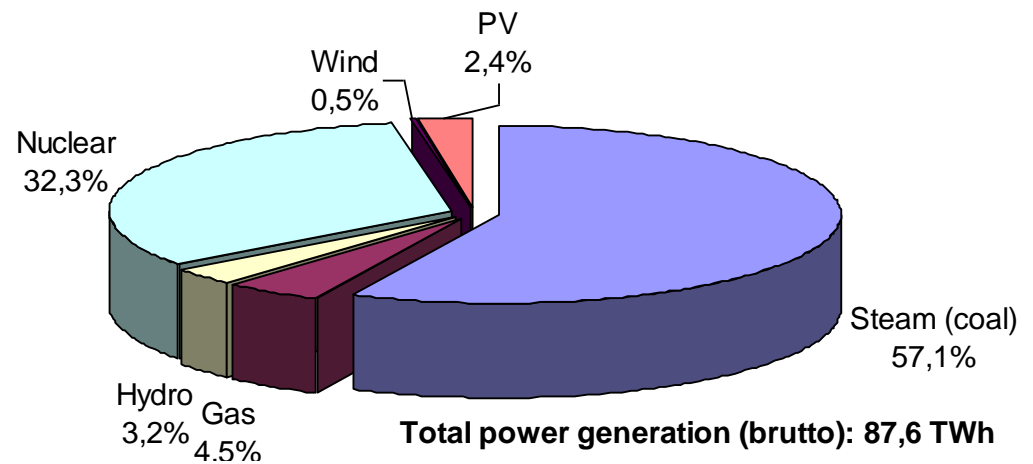


Structure of power generation

Power generation by type, Czech Rep. 2010

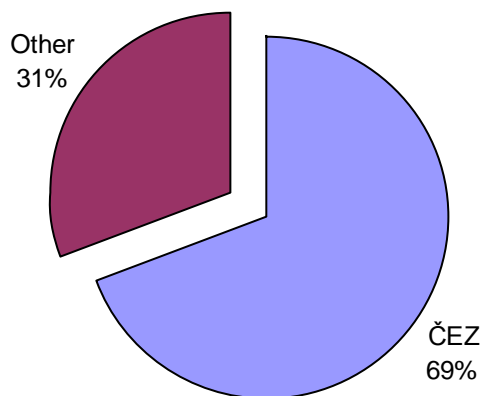


Power generation by type, Czech Rep. 2011

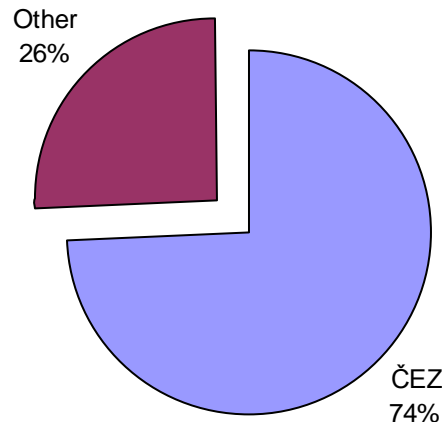


Position of the dominant producer – ČEZ, a.s.

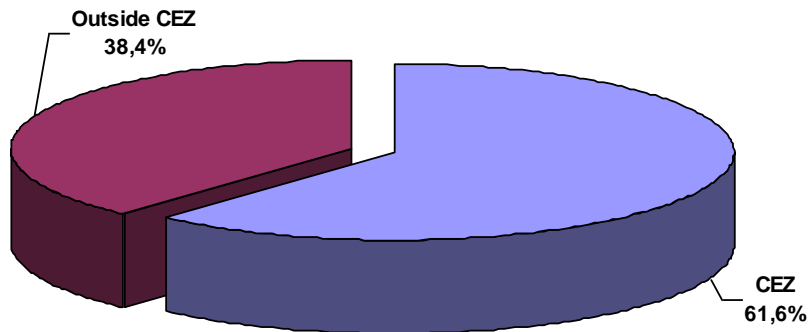
Installed capacity in 2007



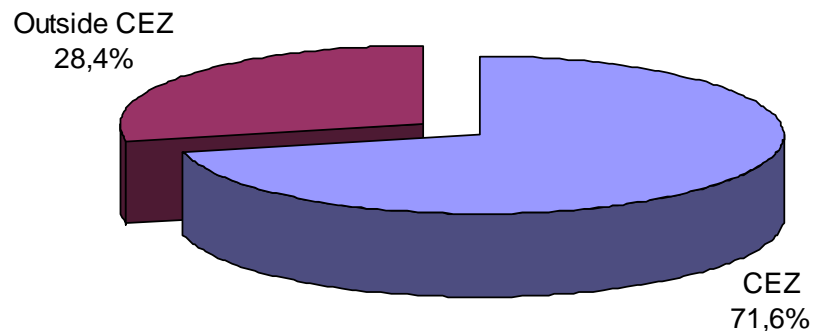
Power generation in 2007



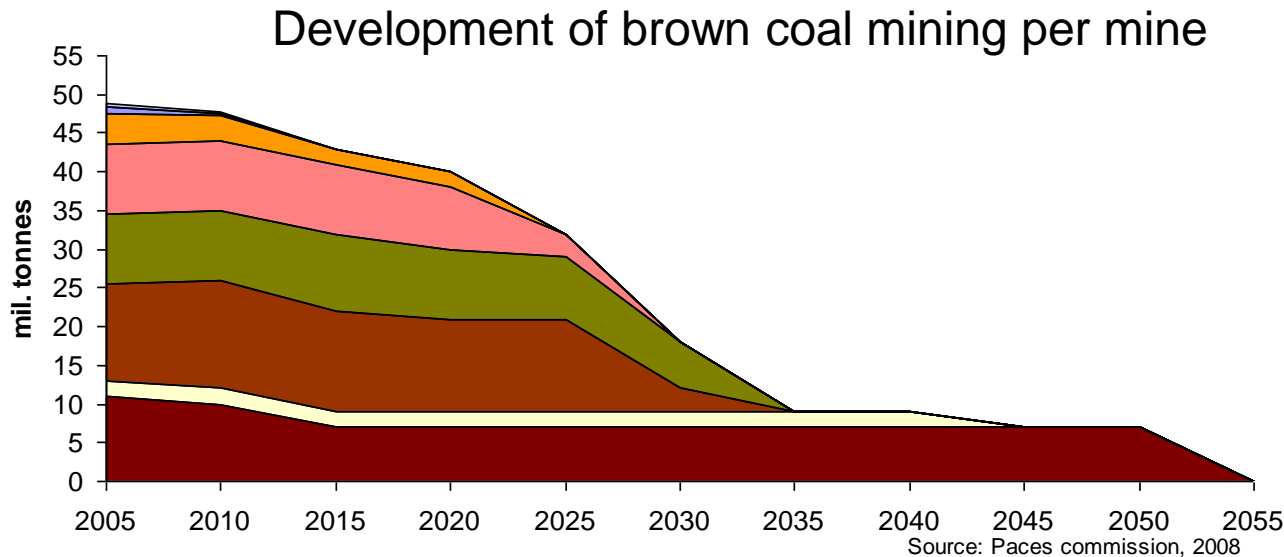
2010: Installed power



Power generation in 2010



Shortage of coal – an uncertainty factor

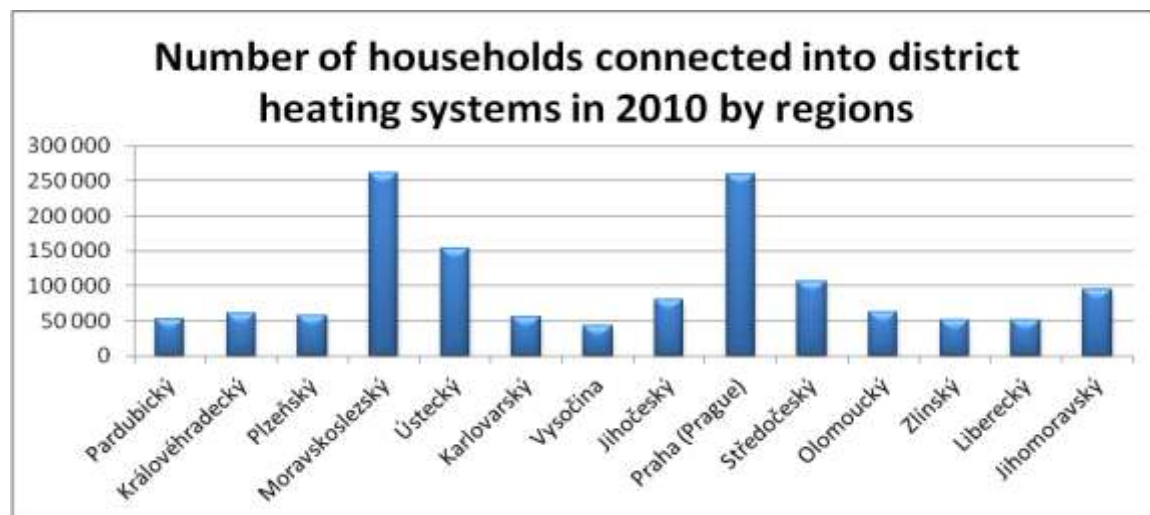
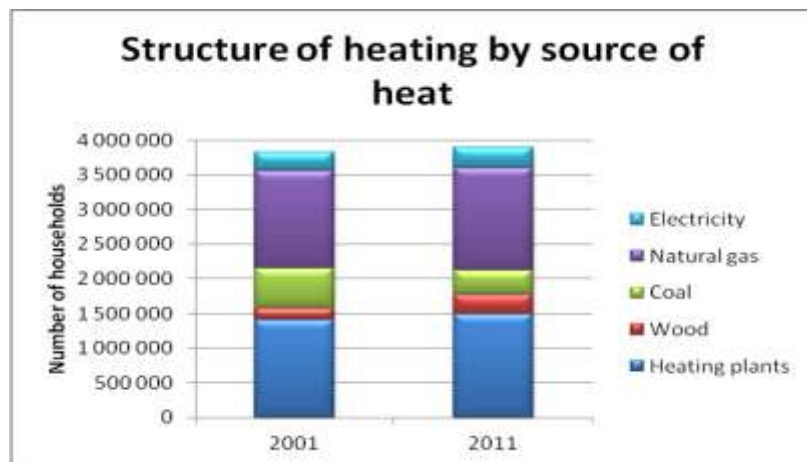


Note: Different colors relate to individual projections for coal mines starting (from the bottom) with the mine Hrabak, through mine Druzba, Libous, Bilina, Jiri, CSA, lignite mines and Centrum

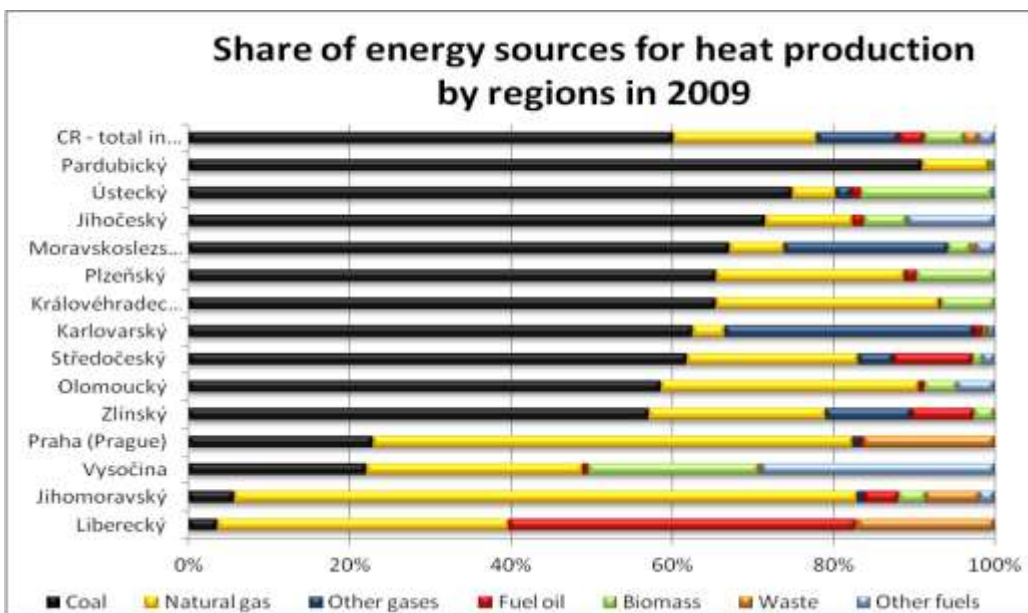
Significant coal reserves are blocked by the resolution of the Czech government No. 444/1991

- highly sensitive political, economic and social problem
- e.g. ensuring coal deliveries to centralized heating systems is being currently discussed

Coal still plays the significant role in heat production



Coal as the cheapest option for DHS



Regions with highest coal share has the lowest heat prices

Number of households supplied by district heating – 1485300

- Share of inhabitants supplied by district heating – 38%
- Number of district heating sources – 2 000
- Number of district heating sources bigger than 5 MW_t – 1 800
- Number of all heating sources within the range $0,2\text{-}5 \text{ MW}_t$ – 17 000
- Share of heat produced in CHP – 75%
- Total heat consumption (in 2009) – 147 134 TJ

Other domestic PES (besides RES)

Oil and natural gas (2006):

Gas: app. 2% of total consump. (app. 8,98 bil. m3 in 2010)

Gas import: app. 75% Russia, 25% Norway

Oil: app. 2,5% of total consump. (7,73 mil. t in 2010)

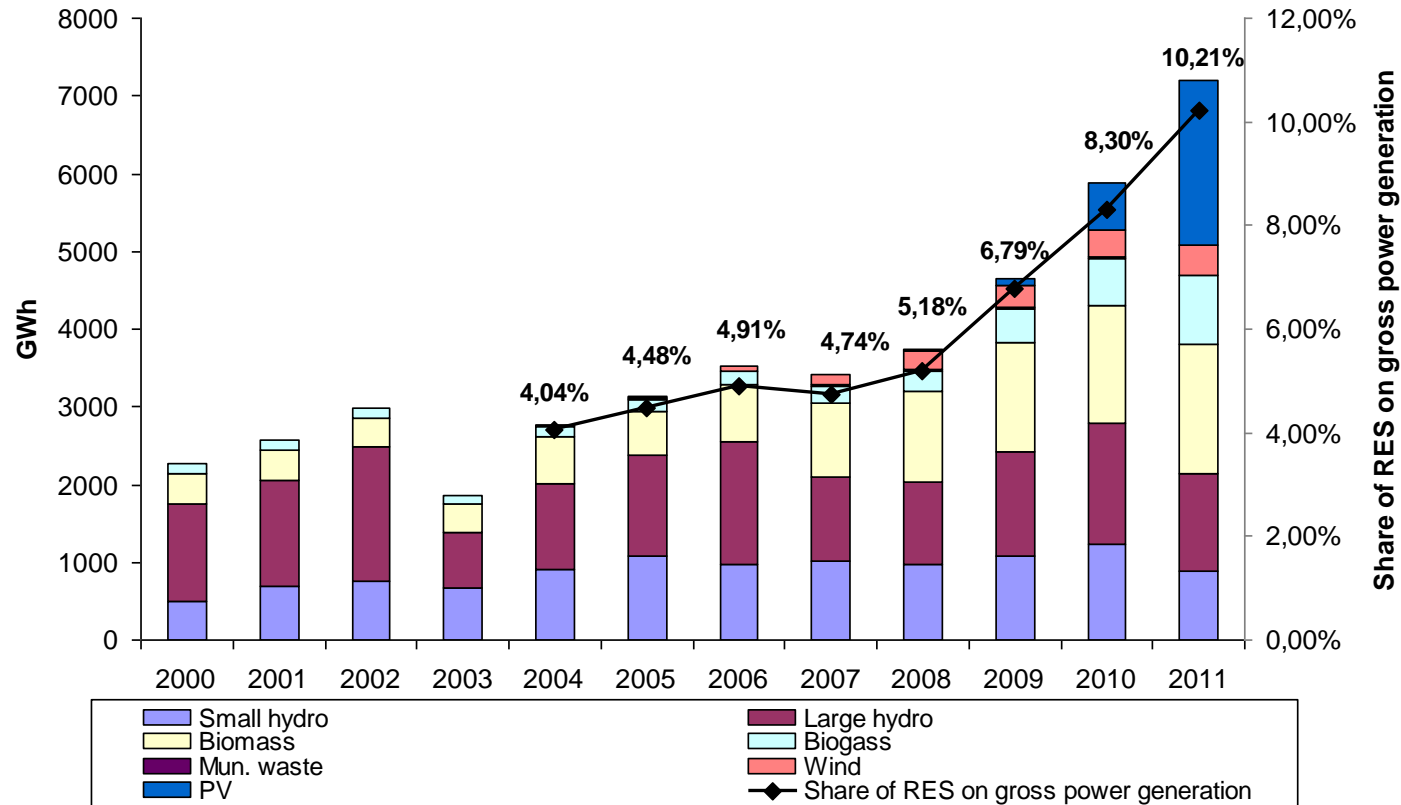
58,7% from Russia

41,3% from IKL pipeline

Uranium

significant potential, currently opened mine Dolní Rožínka

Development of RES power generation

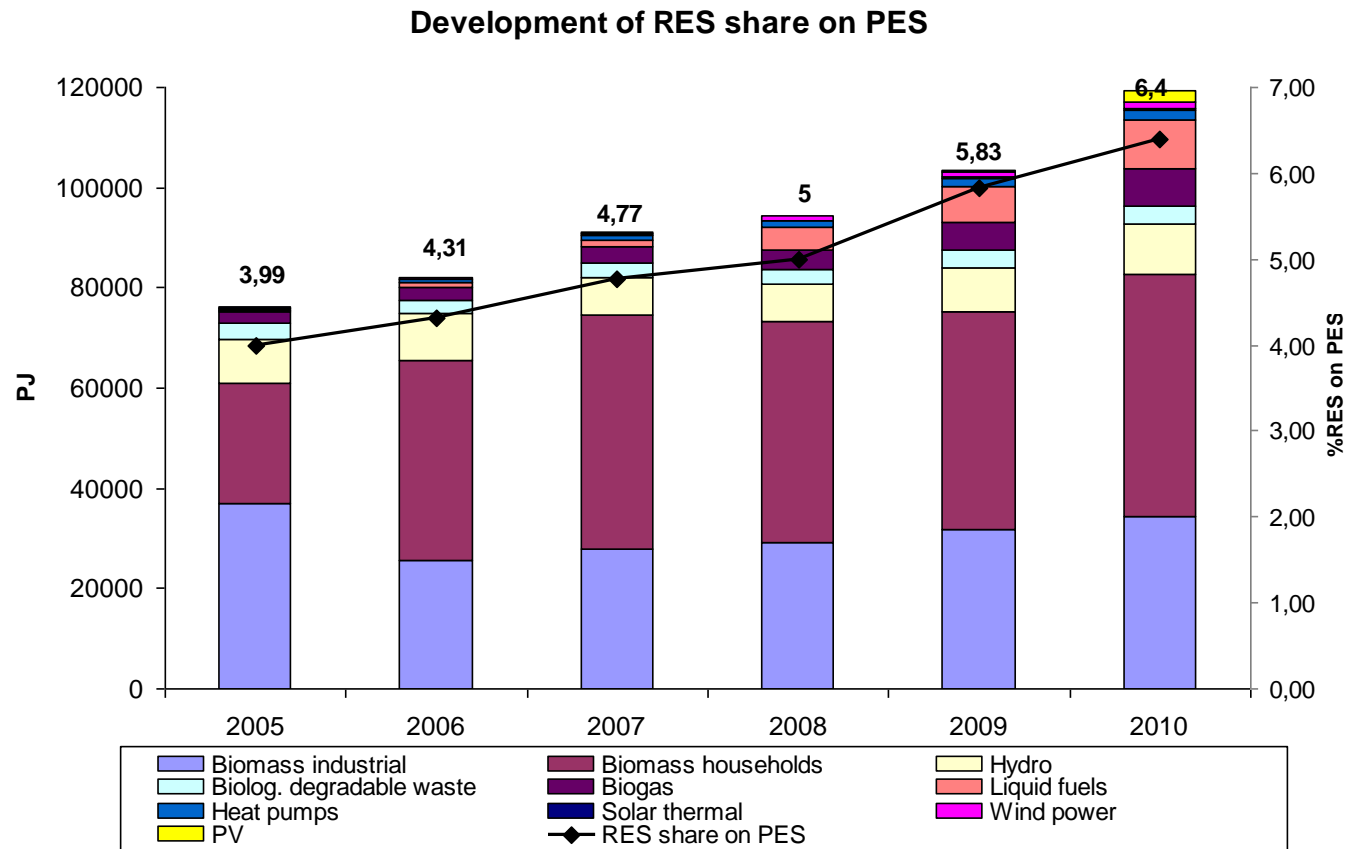


year 2009: 4,67 TWh, 2010: 5,89 TWh, 2011: 7,2 TWh

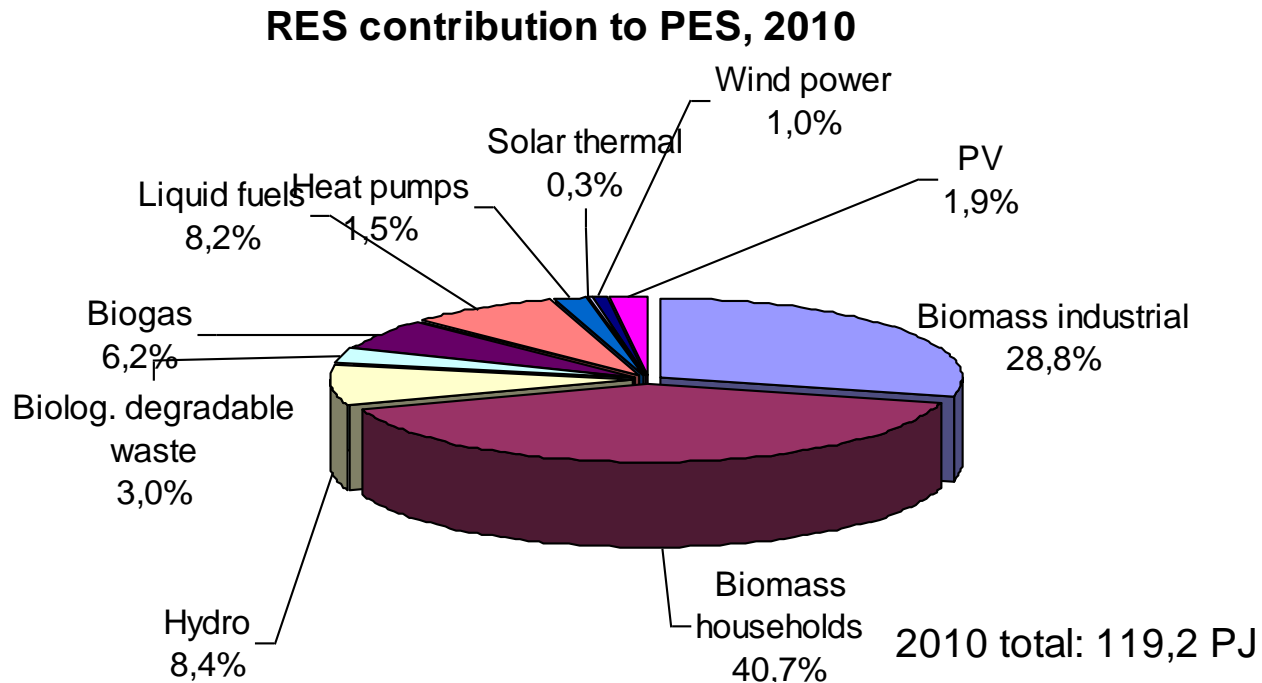
power consumption 72 TWh in 2008, 68,8 TWh in 2009, 70,9 TWh in 2010

indicate target 2010: 8% REACHED ! (originally unexpected !)

Development RES contribution to PES



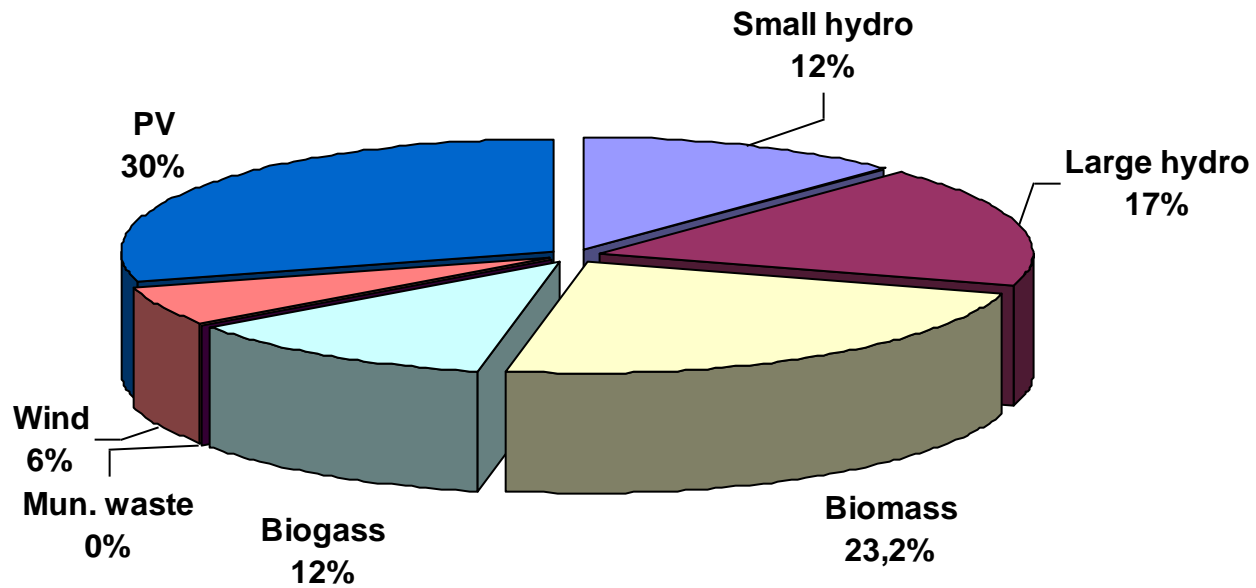
RES contribution to PES



Key role of biomass, biomass for households estimated

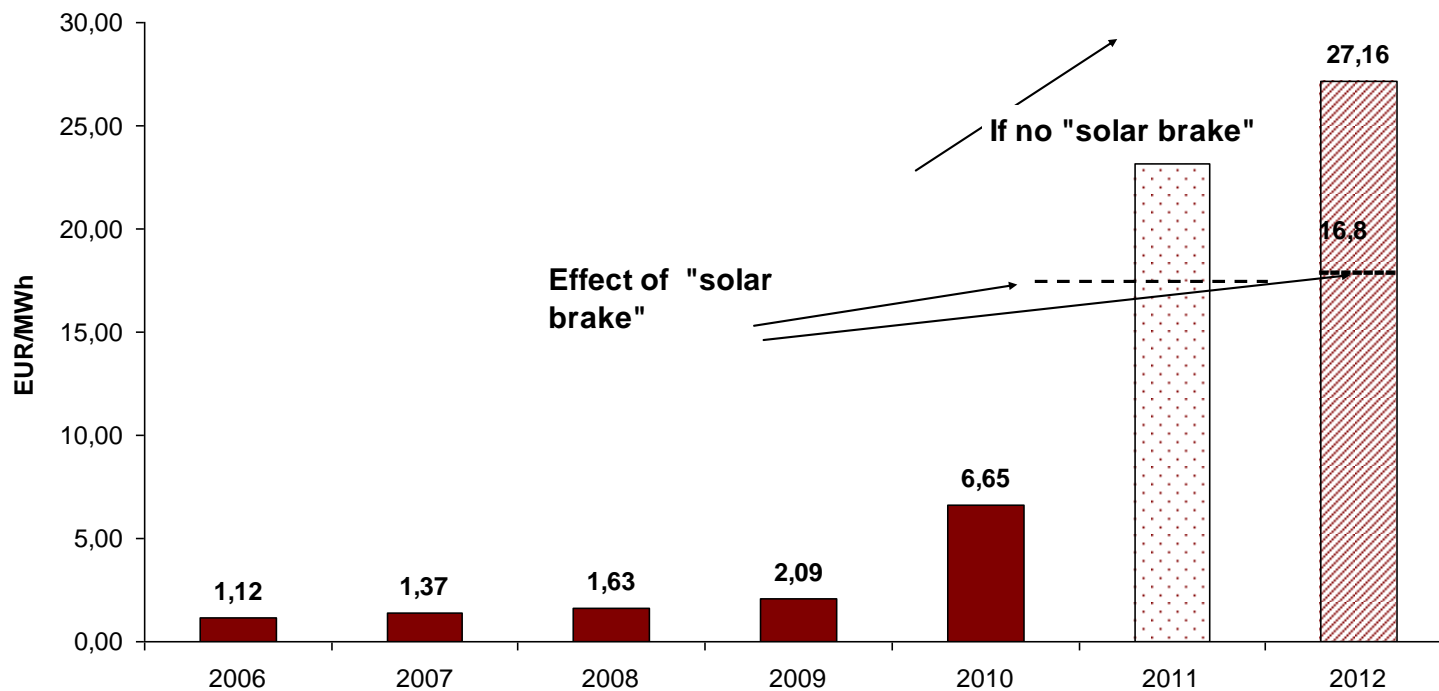
RES power generation

Structure of RES power generation in 2011



RES-E support started to be the real problem in 2010(11)

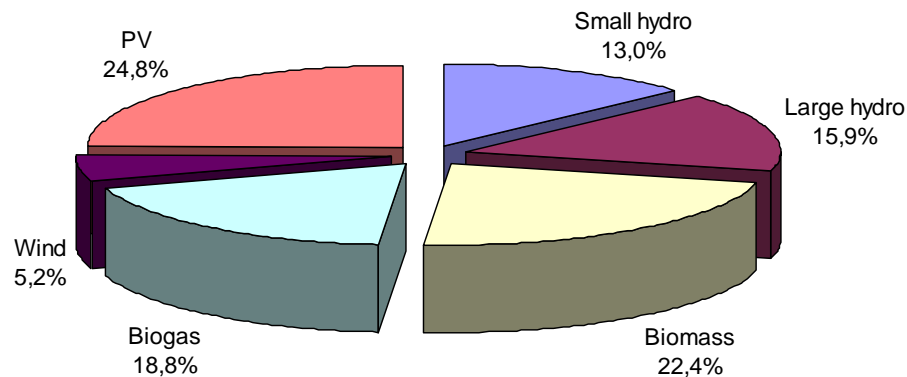
Till the end of 2010 cost of RES-E support scheme was fully transferred to the customers



Fee includes RES, cogeneration and non-traditional sources support
RES share: more than 90%

RES-E support started to be the real problem in 2010(11)

Individual shares on RES power generation
2012 estimate



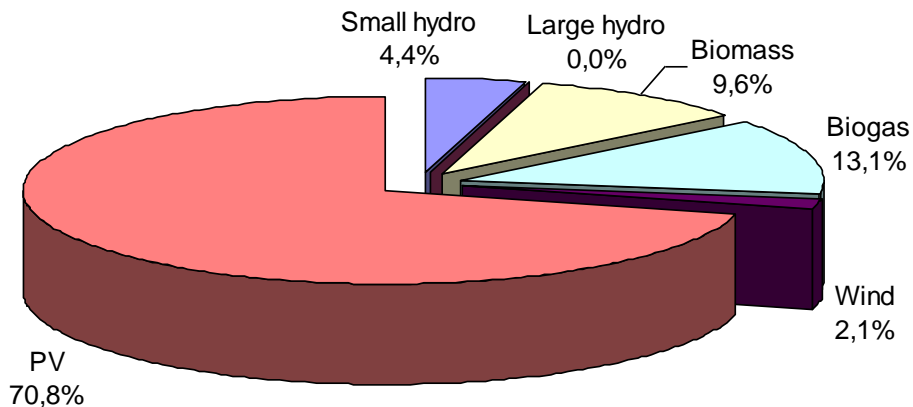
2012 estimate: 8,5 TWh

Source: own calculation

No excuse for any kind of consumers, problems:

- social (low income households)
- economic (competitiveness of industrial companies)

Individual shares on RES support cost
2012 estimate

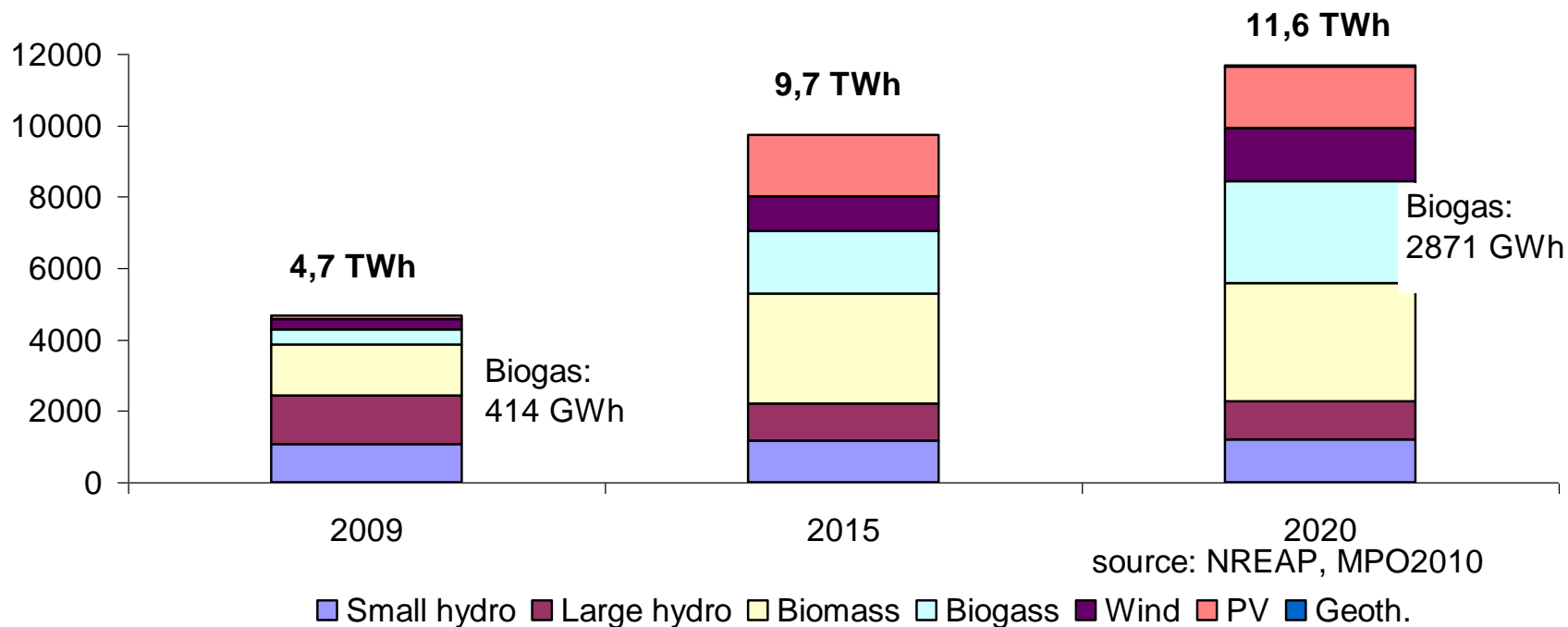


2012 estimate: 1,33 bil. EUR

Source: own calculation

Biomass (biogas) is discussed to be the new threat

NREAP (2010)



Only biogas stations (assuming current values for biogas FIT and price of power) means additional app. 6 bil. CZK/year

State Energy Policy – 2012 update

- Still not approved by the government, will it be ?
- Valid version governmental resolution No. 211 from March 2004
 - completely obsolete

In 2007 government decided to establish special expert commission to analyze long term perspectives of CZ energy branch

- „Pačes“ commission, officially published in autumn 2008, high political sensitivity
- 2010: 1st proposal of revised CEP published
- September 2011: draft for public discussion published
- August 2012: presented by MoIT
- September 2012: government has postponed the decision



State Energy Policy 2012 - priorities

To develop a balanced mix of primary energy sources (PES):

- effective utilization of all available domestic sources,
- securing of self-sufficiency in power generation and preserving positive balance of power export/import.

To increase energy efficiency and energy savings.

To develop the Czech grid infrastructure, enhance of international cooperation and integration of power and gas markets.

To support R&D to keep competitiveness of the Czech energy sector and support of education.

To increase energy safety and security of supply in case of cumulative failures, attacks against critical infrastructure and shortage of PES in the long-term.

State Energy Policy 2012 – changes in PES portfolio

PES used for power generation

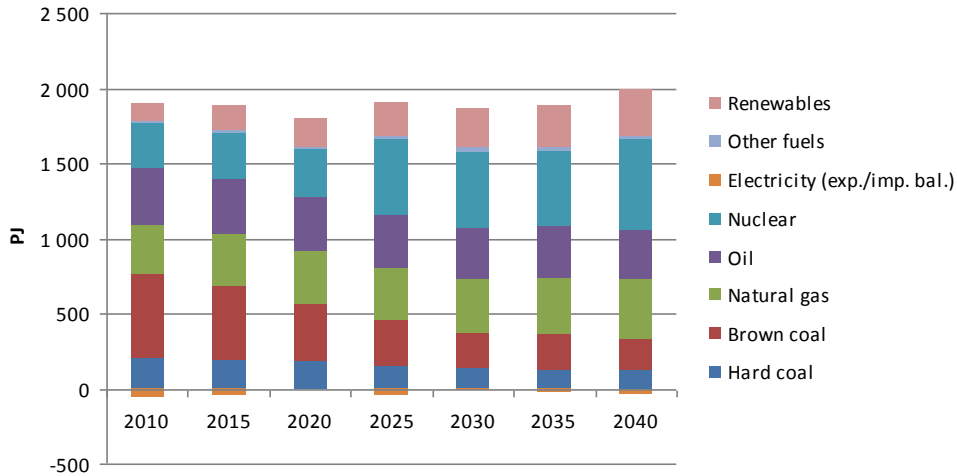
Primary source	2010	2040
Nuclear	33%	50-60%
RES, secondary sources and	11%	18-25%
Natural gas	1%	5-15%
Brown and hard coal	55%	17-22%

Total amount of PES used by Czech Republic

Primary source	2010	2040
Nuclear	16%	30-35%
Solid fuels	40%	12-17%
Gaseous fuels	18%	20-25%
Liquid fuels	20%	14-17%
RES and secondary sources	6%	17-22%

SEP 2012 – PES and power generation

Structure and development of PES



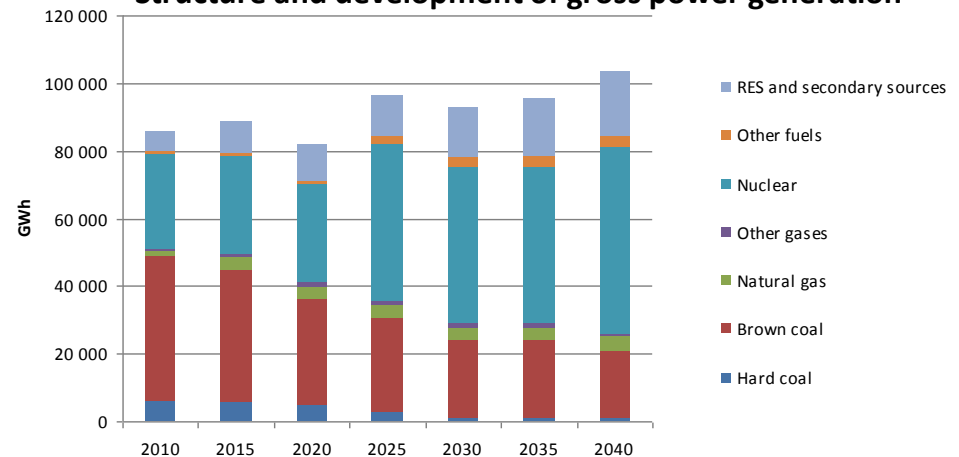
Continuation in nuclear program – new blocks:

- 2 block in Temelin site (tender for supplier of technology) – (?) 2025
- 1 block in Dukovany (2040)

RES development

- biomass is taken as the decisive source: up to 1 mil ha of land available
- elimination of operational support (? Since 2015)

Structure and development of gross power generation



From history of CZ RES support

till 2001:

no systematic support, „market prices“ for power purchase applied only not obligatory support from the funds of Energy Agency and State Environmental Fund available (limited sources) both for power and heat – hundreds millions of CZK annually

2002-2005:

support based on FIT system, tariffs were set up on year base by price decisions of Energy Regulatory Office (issued in November for next year)

- FIT defined based on economic analysis of reference projects, rate of return approach (regulated WACC value)
- Basic differentiation of FIT by the type of RES
- Risk for the investors – conditions legally guaranteed only for one year (only declaration of keeping the FIT values)
- Investors are „waiting“
- Co-firing support started from 2004
- 1,5 year discussions on RES-E Support Act

From history of CZ RES support 2

Since 1/2006:

new legislation – Act on RES-E support No. 180/2005

FIT and green bonuses system for RES-E projects

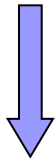
System solution for RES-E project

- creation long term and favorable conditions

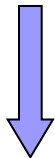
No solution for RES project for heat generation (deleted from Act proposal)

BASIC IDEA OF RES-E SUPPORT (Act 180/2005)

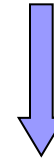
TO MINIMIZE RISK FOR THE INVESTORS



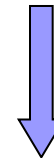
Creation of stable and favourable conditions for the investors



Creation of business environment to reach the indicative target for power from RES in 2010 (D. 77/2001)



Risk reduction also means reduction of fair rate of return on capital invested



Cost effective RES-E support scheme expected – minimization of impact on final power consumers or on state budget

Support scheme was assumed as the rational solution up to the end of 2008

Structure of CZ support scheme

- F.T. and G.B. - Act 180/2005 (plus decrees of ERO, MoE, MoIT) – substituted since 2013 by Act 165/2012
 - But rules remain valid for already existing plants
- Tax incentives (canceled in 2010)
- Support of decentralised production
- Support from EU funds (esp. period 2007-2012)
- Other support

Main principles of Act 180/2005

- Only for power from RES (+ methane from closed mines)
- FIT and green bonuses (GB) scheme - choice for each year
 - FITs and GBs are paid by distribution / transmission company
- Obligatory power purchase (F.T.), GB producer should find the customer
- Differentiation by RES type, logic of time matrix
- F.T. guaranteed explicitly for (at least) 15 years
- G.B. should reflect higher business risk, no limit for their changes from year to year (but you can go back to FIT scheme)

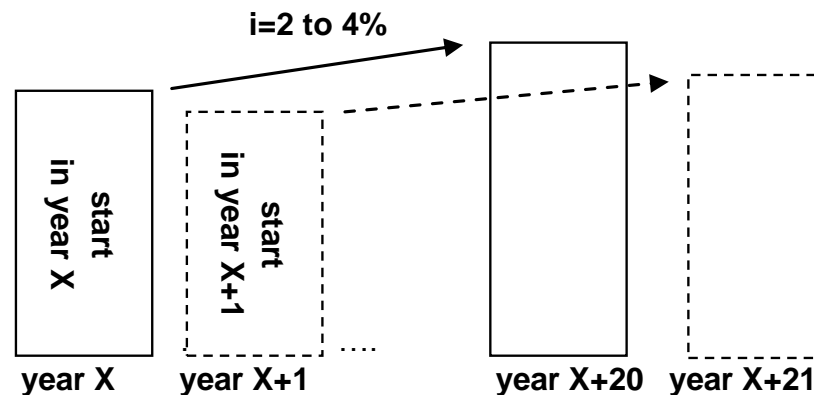
Main principles of Act 180/2005 - 2

- Automatic annual updating of FIT with the inflation (PPI)
 - not valid for biomass and biogas (fuel fluctuation might be higher)
- Reduction of FITs for next year only for new sources possible: -5% at max.
- FITs and GBs are annually announced by ERO in Price decision)
- Co-firing supported only via GB
- Economic preference of intentionally grown biomass

Logic of time matrix

FITs and GBs values are defined for next year by corresponding Price decision of ERO - r.g. (7/2011 for 2012)

- Project start year defines baseline for project FIT value
 - ❑ When coming back from GB, project gets FIT of baseline year
- FIT values are updated with the inflation (based on PPI)



Main principles of Act 180/2005 - 3

- ERU is responsible for creation of economic motivation to meet 2010 indicative target
 - No specific methodology for FITs and GBs calculation mentioned in the Act

- Differentiation of support for individual biomass types - MoE notice 482/2005 (453/2008 update), three basic biomass categories:
 - Intentionally planted biomass (and biomass from it)
 - Residuals from agriculture (e.g. straw) and forestry (residuals from felling), from food and other industries (e.g. residuals from paper production), grass from PGL
 - Wood, wooden residuals with possible material utilization (e.g. sawdust)

- GB also for power generated for „own“ consumption of producer (incl. „island installations“)

Relevant ERO notices to Act

ERU notice 475/2005(amended by 364/2007, 409/2009, 300/2010, 338/2011)

- Defines indicative technical and economic indicators of RES-E projects
 - ❑ Presents informative values of the reference projects used for FIT calculation
 - ❑ Periodical update of reference values (usually in two years period)

- Defines expected technical life time of technologies for given RES and some other technical parameters (degradation of PV as -0,8%/year, expected annual wind speed (6 m/s), etc.)

- Mentions logic of FIT calculation (in brief) – WACC approach

Example of indicative parameters

Indicative project parameters

	Inv. cost EUR/kW	Inv. cost CZK/kW	Load factor Hours/year
Wind	1680	42000	2100
PV	2400	60000	980
Small Hydro	5800	145000	4000
Biogas	4000	100000	7500
Biomass	3000	75000	5000

State in June 2012

Technology lifetime:

➤ 30 years small hydro, 20 years for all other

No specific assumption on operational cost

Relevant ERO notices to Act - 2

ERO notice 150/2007, amend. 140/2009 (primarily on regulation issues)

- Update of support scheme (explicit declaration of principles used for FIT calculation)
- limitation of inflation rate for FIT annual update – based on PPI:
 - min 2%, max. 4% (exception: biomass and biogas)
- FIT guaranteed for the whole technical life of RES plant (defined in ERO notice 475/2005 and its updates)
- Discussions (sometimes) on guaranteed period
 - ❑ Act 15 years (implicitly at least)
 - ❑ Notice 20 years – technology lifetime - explicitly

Other updates of support scheme

Introduction of new RES categories

- 2008: differentiation between biogas plants based on prevailing input
 - ❑ waste biomass (e.g. manure) x intentionally planted (e.g. maize)
 - ❑ AF1 (50% at least of input in dry matter – mass – coming from intentionally planted biomass) – higher fuel cost expected – higher FIT, monthly base for input balance
 - ❑ AF2 (majority of input is waste)

- 2009: PV differentiated into two categories:
 - ❑ Less than 30 kW
 - ❑ Over 30 kW

- 2011: PV differentiated into 3 categories <30 kW, 30-100 kW, >100 kW, but since March 1st, 2011 only installations on roofs and facades below 30 kW are supported

- 2012: Biogas - requirement for rational utilization of heat to qualify into AF1 (at least 10% compared with generated power)

Updates of support scheme - 5

Other limitations:

See Price decision 7/2011

- Small hydro: to qualify as the new plant, age of technology should be less than 5 years (if not, only eligible for FIT before 2005 – smaller value)
- Wind: similarly, limitation for age of technology (rotor and generator) is max. 2 years

Reason: to avoid installation of used and less efficient technologies

Who bears the cost of support

- FITs and GBs are paid by distribution and transmission companies
- Up to the end of 2010 support cost were fully transferred to the final power consumers proportional to their consumption via separate fee (defined by ERO as part of electricity price)
- In 2010 started to be obvious that due to enormous boom of PV these cost cannot be transferred in full to the final consumers
- Since 2011 combined financing introduced (participation of state budget, special fees imposed on emission allowances distributed to power companies and PV tax imposed to PV operators) – see later

Funding from OP

EU structural funds (2007-2013)

- OPPI / part Ekoenergie: Ministry of Industry and Trade (primarily targeted to entrepren. projects)
- OPŽP: Ministry of Environment (primarily targeted to municipalities and NGOs)
- Rural development plan: Ministry of Agriculture (targeted to biogas stations as a tool for diversification of agriculture business)
- No legal claim, but billions of CZK already allocated (not taken into account in FITs and GBs calculation)

FIT and GB values – time matrix

Example for wind power plants

FIT for wind power plants

start of operation	CZK/kWh	EUR/kWh
after 1.1.2012	2,23	0,089
in 2011	2,28	0,091
in 2010	2,33	0,093
in 2009	2,49	0,100
in 2008	2,73	0,109
in 2007	2,8	0,112
in 2006	2,85	0,114
in 2005	3,12	0,125
in 2004	3,28	0,131
before 2004	3,63	0,145

- Reduction of F.T. reflects technical development and reduction of specific cost

FIT and GB values

Values for 2012

2012	FT	GB
	EUR/MWh	EUR/MWh
Small hydro	128	86
Biomass	183/141/105	144/102/66
Biogas AF1	165	123
Biogas AF2	142	100
Wind	89	0
Geothermal	180	138
PV	246	203
PV start in 2010	510	467

Biomass types 1/2/3

- 1: intentionally planted biomass
- 2: forestry residuals and agricultural waste
- 3: other types of biomass (wood chips, etc.)



FIT and GB values 2

CZ FIT are not directly comparable with those from other countries

Differences are in:

- assured period
- inflation inclusion
- and other arrangements

FIT and GB values 3

Changes of FIT in 2004-2012 caused by:

- Changes of exchange rate CZK to EUR
 - ❑ 2004: app. 33 CZK/EUR
 - ❑ 10/2008: 24.8 CZK/EUR (9/2010: 24.5, 6/2012: 25,48)

- Technology development (e.g. wind, PV)

- Necessity to use worse location (hydro)

- Changes in biomass prices (biomass availability, increase of standard agricultural production profitability push biomass prices up)

Look inward of methodology

Act 180/2005 does not define specific methodology for FIT and GB calculation

- They have to create „motivation“
- Basic explanation in ERU notice 475/2005
 - ❑ Rate of return approach applied
 - ❑ FITs for different RES should assure the same rate of return
 - ❑ Reference project for each RES type
 - ❑ CF analysis during the whole lifetime

Look inward of methodology - 2

Rate of return approach

- Calculation of minimum price c_{\min} for each RES type (i.e. reference project)

$$NPV = \sum_{t=1}^{T_z} CF_t \cdot (1 + r_n)^{-t} = 0$$

$$\sum_{t=1}^{T_z} [c_{\min t} \cdot Q_t + DOT_t] \cdot (1 + r_n)^{-t} = \sum_{t=1}^{T_z} V_t \cdot (1 + r_n)^{-t}$$

- T_z .. lifetime, r_n .. nom. discount, Q .. quantity produced, V .. expenses, DOT .. oper. subsidy
- Cash flow projection

Look inward of methodology - 3

Rate of return on capital invested

- NPV=0 means that rate of return on capital invested equals to discount rate
- Discount rate has meaning of WACC

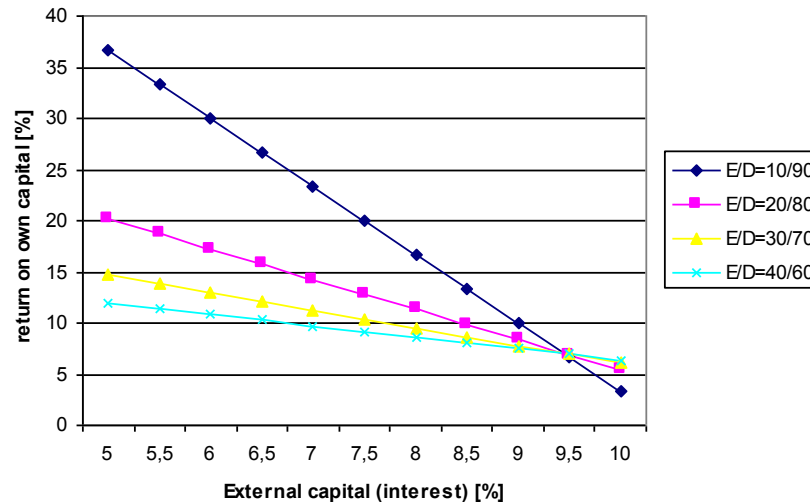
E ..equity, D .. debt capital, i .. interest rate, d .. tax rate

$$WACC = r_{ed} * \frac{E}{E + D} + i * (1 - d) * \frac{D}{E + D}$$

Look inward of methodology - 4

Discount as WACC

- C_{\min} calculation assume typical structure of financing (E/D): E share 20-30%



results in different rate of
return to equity

based on different access
to capital

Look inward of methodology - 5

WACC value – app. 7% (derived from CAPM model)

Since 2010: 6.3%

- C_{\min} taken as the basis for FIT definition
- Almost all business risk cut off
- Responsibility for power deviations on side of distribution company

Look inward of methodology - 6

C_{\min} calculation

- Current CZ business conditions assumed (tax rate, tax depreciation policy, tax holidays, etc.)
- Inflation inclusion: 2,5% for all expenses and 2-4% for revenues (based on PPI value)
- Assumption of „rational“ utilization of originating heat (biomass and biogas applications – app. 150-200 CZK/GJ on the source output)

Changes of Act 180/2005

Situation at the end of 2008:

No changes in 180/2005 Act are discussed

- No-one wants to open „Pandora box“

But some things discussed:

- Cancellation of tax holidays (would need recalculation of FIT)
- Reduction of FIT and GB in case of support from EU funds (not accepted)

Reality of 2009

Enormous PV boom started

- State authorities are not able to effectively react !

Stop of PV boom in February 2010 by transmission and distribution companies

- No new permission to the grid connection are issued

Changes in support scheme were introduced into support scheme (change of Act 180/2005) during 2010

- ***It is too late, conditions for 2010 already fixed***
- PV boom is in full run, CZ became the PV paradise
- Enormous extra profit (rate of return), FIT is 0.5 EUR/kWh, +40-45% more than is adequate



2010 reality

April 2010:

- -5% limitation for new F.T. is not effective if payback time is less than 11 years

September 2010:

- governmental proposal to cancel PV support for plant on ground (since March 1st 2011)

2010 reality 2

November 2010: changes of „tax“ act

- **income tax holidays cancelled** for all RES applications (including already running, last applicable for tax period 2010)
- **changes in depreciation periods for PV:**
 - current situation: PV panels are 55-60% investment cost, but depreciation period is only 5 years
 - since 2011: depr. period is defined as 240 months (similarly for financial leasing, its length should be also 240 month) – valid also for already running projects, not depreciated part is allocated to 240 months minus number of month of depreciation

December 2011: Introduction of tax on gross revenues for PV

Lessons learnt from CZ case

FIT scheme is theoretically effective, but:

- Application of the same rate of return has led to the different motivation for the different RES type
 - ❑ *but original motivation has been the same chance !*
- Parallel support of some types of RES projects (e.g. biogas stations were eligible for investment support 30-60% from EU funds)
 - ❑ *but FIT were calculated assuming no other support*
- Missing the real possibility to reflect the changing priorities of state
 - ❑ *but SEP and NAP for RES as the other strategic documents*

Lessons Learnt from CZ Case - 2

FIT scheme is theoretically effective, but:

- Green bonuses have been defined to create motivation to the rational behavior for the investors
 - ❑ *but high majority of RES-E plant uses FIT scheme !*
- Periodical update of reference projects were seen as the effective tool for FIT definition
 - ❑ *but problem of strong lobbyism and data collection*
- Primary orientation to technical indicators (MW and MWh)
 - ❑ *but finally great surprise what the costs are and then searching who is responsible*
- Missing solution for utilization of originating heat
 - ❑ *it led to the wasting of RES potential (e.g. very high load factor for solid biomass application – no heat utilization)*

What happened next ?

From one extreme to the another !

- Complete amendment of RES support legislation, Act 165/2012
- Extremely complicated discussion, strong lobbyism
- Selected changes:
 - ❑ Complete change of the economic logic – only 15 year payback is guaranteed
 - ❑ creation of roofs for RES categories – link to NAP for RES
 - ❑ roof for support (4.5 CZK/kWh)
 - ❑ FIT available only for some RES categories, GB for others, hourly and yearly GB values
 - ❑ financial support administrated through OTE
 - ❑ prohibition of co-firing (end of support)
 - ❑ requirement for heat utilization (e.g. no biogas station without significant heat utilization, or biogas utilization)
 - ❑ reduction of FIT and GB values in case of investment subsidies

Act 165/2012 on supported sources

1. Biogas:

➤ FIT and GB only for biogas stations where at least 30% of biomass is not intentionally planted biomass (planted on arable land and permanent grasslands) and where at least 50% of primary energy in biomass is effectively used

2. Biomass

➤ Burning of solid biomass or bio liquids: support available only for cogeneration certificated by Ministry of Industry and Trade

3. Biomass

➤ Differentiation according to biomass category (some changes in category definition, e.g. wood chips from forestry residuals are not supported)

Act 165/2012 on supported sources 2

4. Link to NAP RES

➤ if expected values of given year (for given kind of RES) were already reached two years ago, support for this RES category is not defined for new sources in next year

5. Form of support

Right to choose among FIT and GB has (once a year):

- Plants below 100 kW
- Small hydro below 10 MW
- Plants over 100 kW has right only for GB (hourly)

6. FIT and GB values limitation

➤ FIT and GB values limited by 4500 CZK/MWh (180 EUR/MWh)

Act 165/2012 on supported sources 3

7. Support scheme financing

- annual governmental resolution (to the end of October) defining the limit of contribution from state budget (at least on the value of operational support of heat)

- remaining support cost are transferred to the final power consumers via special fee (defined by ERU)
 - ❑ Possibility to differentiate between consumers according to their power consumption

8. Already existing sources

- keeping the current rules

Act 165/2012 on supported sources 4

9. Cancellation of co-firing support at the end of 2015

- support of co-firing is cancelled if it is not (high efficiency) cogeneration

10. Green bonuses

- yearly values for:
 - ❑ High effective cogeneration
 - ❑ For plants below 100 kW
- hourly values:
 - ❑ All other

Act 165/2012 on supported sources 5

11. Green bonuses calculation

➤ hourly values:

- ❑ Difference between corresponding FIT and hourly spot price (spot market organized by OTE)

➤ yearly values:

- ❑ Difference between and expected average market price (on spot market)

➤ monthly settlement

12. Island (grid-off) installation are not supported

Act 165/2012 on supported sources 6

13. 15 years payback guaranteed (only)

- Leads to the significant reduction of FIT and GB (rate of return is app. 3,5-3,7 %, SH slightly higher)

14. Explicit inclusion of inflation

- growth of FIT by 2% annually

15. Support of bio methane introduced

- GB 1700 CZK/MWh of HHV (68 EUR/MWh)
 - Included as the separate fee into natural gas distribution and transmission

Act 165/2012 on supported sources 7

Support of heat from RES

- GB in CZK/GJ (annual value), max. 50 CZK/GJ
- for sources with P_{inst} over 200 kW
 - Not valid for solar systems, thermal pumps



Děkuji za pozornost!

*Thanks for the
attention !*