Slovak Innovation and Energy Agency

Renewable energy sources in the Slovak Republic

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1.1 Directive 2009/28/EC on the promotion of the use of energy from renewable sources

In april 2009 the European Parliament and the Council of the European Union approved Directive 2009/28/EC on the promotion of the use of energy from renewable sources (Directive 2009/28/EC). This Directive sets:

- mandatory national targets for the overall share of energy from RES in gross final consumption of energy and for the share of energy from RES in transport,
- rules relating to statistical transfers between Member States, joint projects between Member States and with third countries, guarantees of origin, administrative procedures, information and training, and access to the electricity grid for energy from renewable sources,
- sustainability criteria for biofuels and bioliquids

1.2 Mandatory national targets for the overall share of energy from RES (1)

Mandatory national targets for the overall share of energy from RES were determined with acceptance of RES use in 2005 and targets consisted of 2 elements:

- equally for each member state +5,5%,
- according to GDP per inhabitant of each member state.

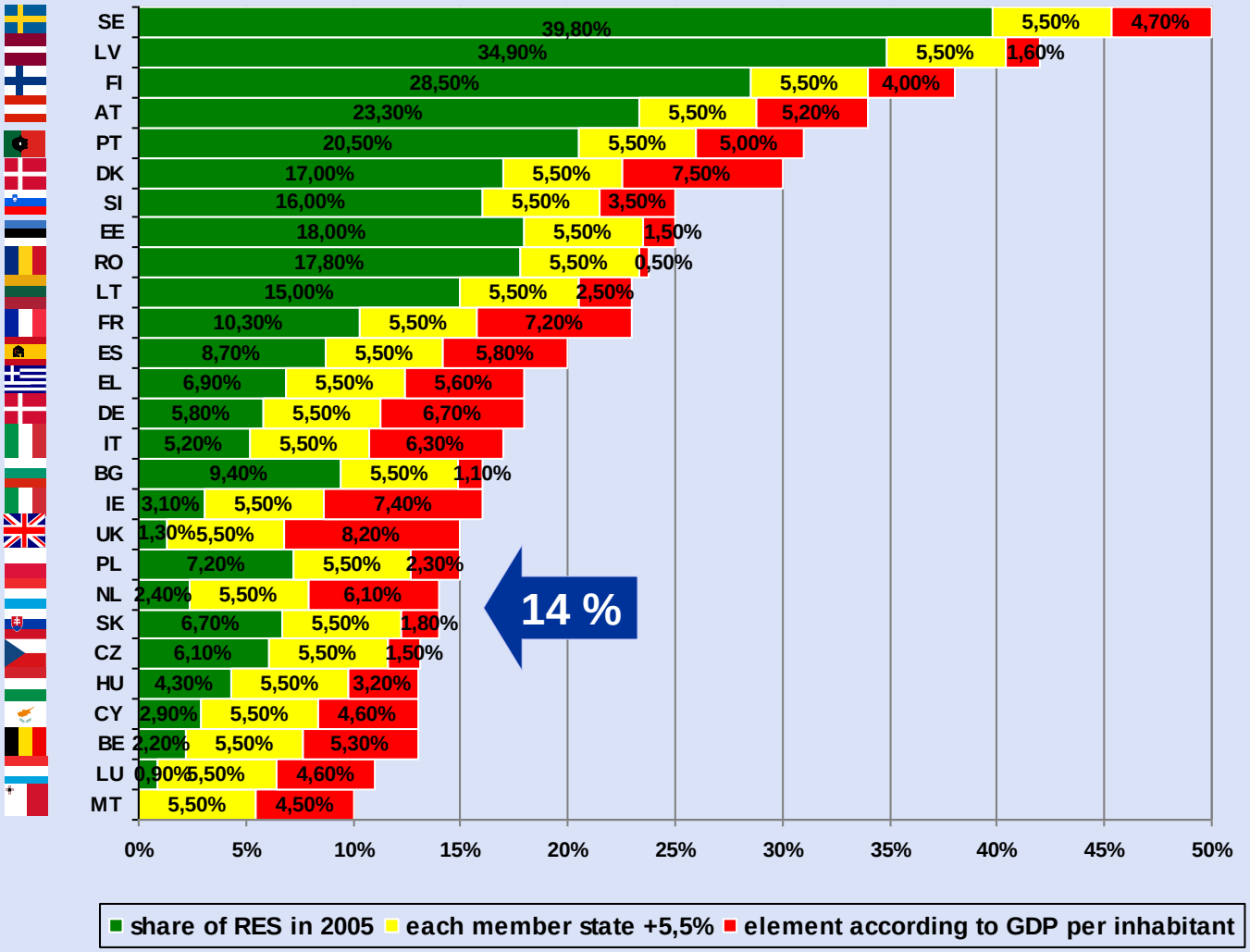
In addition, each Member State shall ensure that the share of energy from RES in all kinds of transport will be at least 10% of final energy consuption in 2020.

Mandatory national target for the Slovak Republic is:

14% share of energy from RES in gross final energy consumption,

10% share of energy from RES in transport.

1.2 Mandatory national targets for the overall share of energy from RES (2)



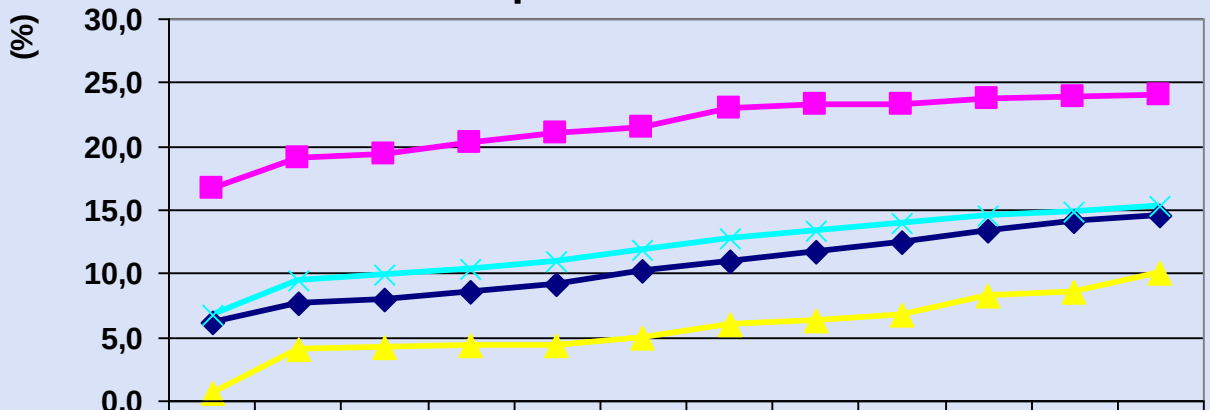
1.3 Strategic and conceptual documents related to RES

- **Energy Policy of the Slovak Republic (2006),**
- **Strategy of higher utilization of RES (2007),**
- **Energy Efficiency Concept of the Slovak Republic (2007),**
- **Energy Efficiency Action Plan for years 2008-2010 (2007),**
- **Energy Security Strategy of the Slovak Republic (2008),**
- **National Action Plan for energy from RES (2010)**
- **Energy Efficiency Action Plan for years 2011-2013 (2011).**

1.4 National Action Plan for energy from RES (1)

Targets:
15,3 % share of energy from RES in gross final energy consumption,
24,0 % share of electricity produced from RES,
14,6 % share of heat produced from RES,
10,0 % share of energy from RES in transport.

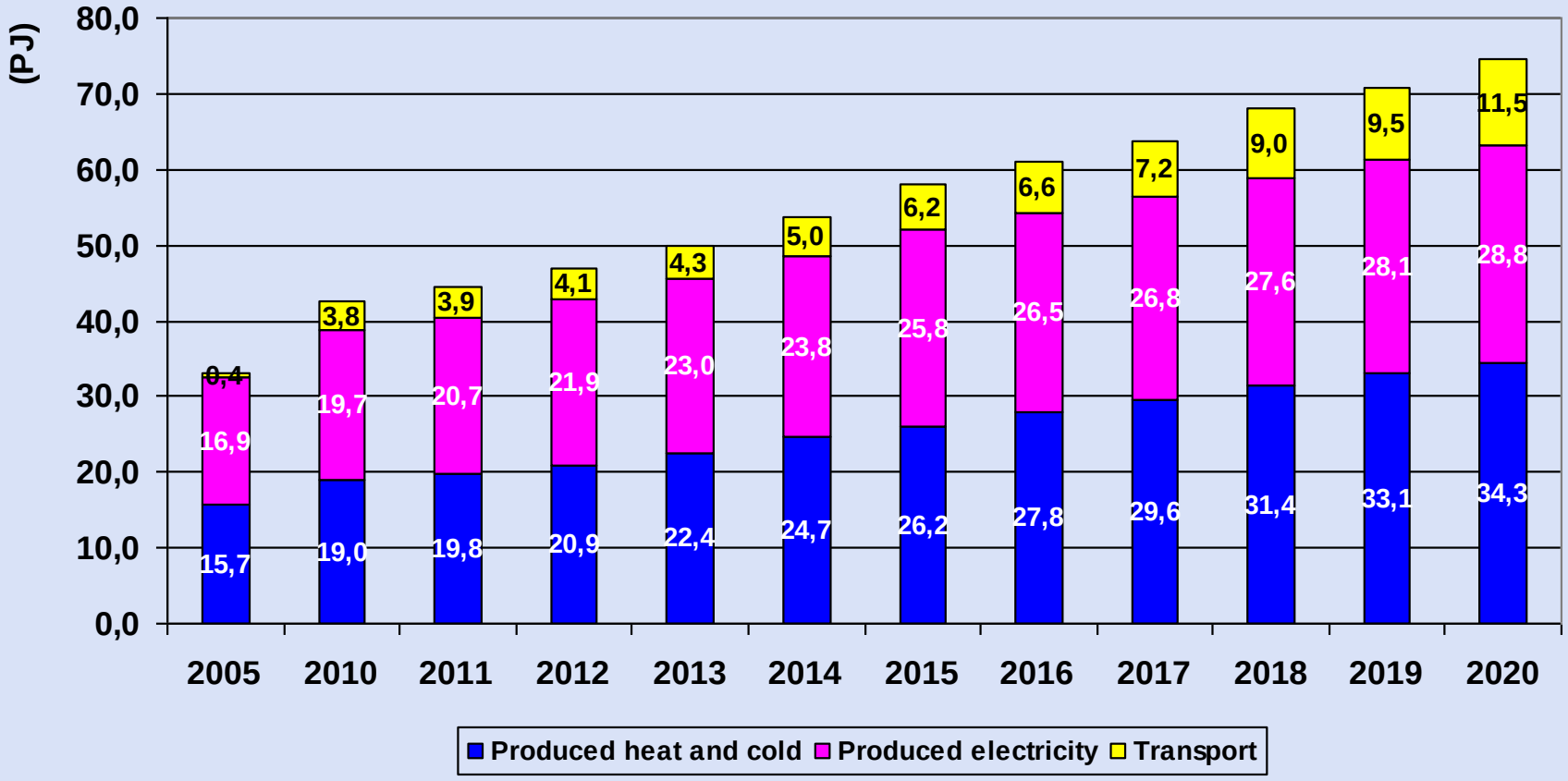
Estimated trajectory of share of energy from RES in gross final energy consumption



	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Produced heat and cold	6,1	7,6	8,0	8,5	9,2	10,2	10,9	11,7	12,5	13,3	14,1	14,6
Produced electricity	16,7	19,1	19,3	20,2	21,0	21,5	23,0	23,3	23,3	23,7	23,9	24,0
Transport	0,6	4,1	4,2	4,3	4,4	5,0	6,0	6,3	6,8	8,3	8,5	10,0
Overall share of RES	6,7	9,5	9,9	10,4	11,0	11,8	12,8	13,3	13,9	14,6	14,9	15,3

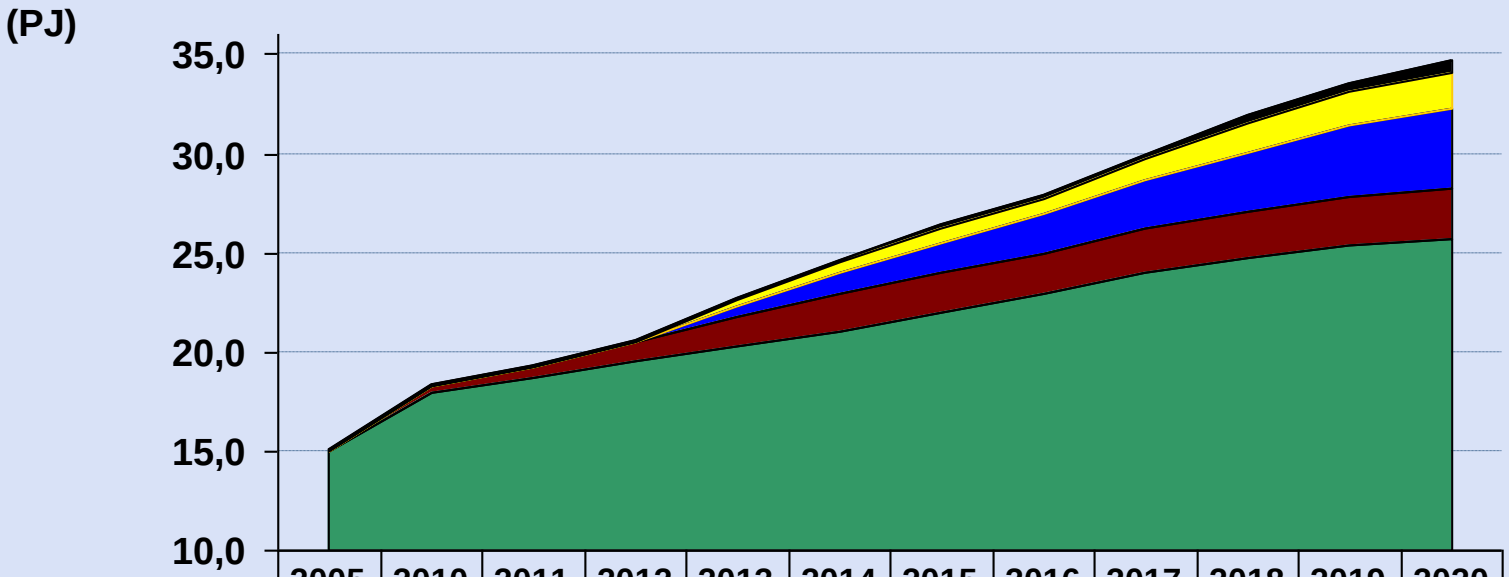
1.4 National Action Plan for energy from RES (2)

Trajectory of share of energy from RES in gross final energy consumption



1.4 National Action Plan for energy from RES (3)

Prognosis of heat production from RES



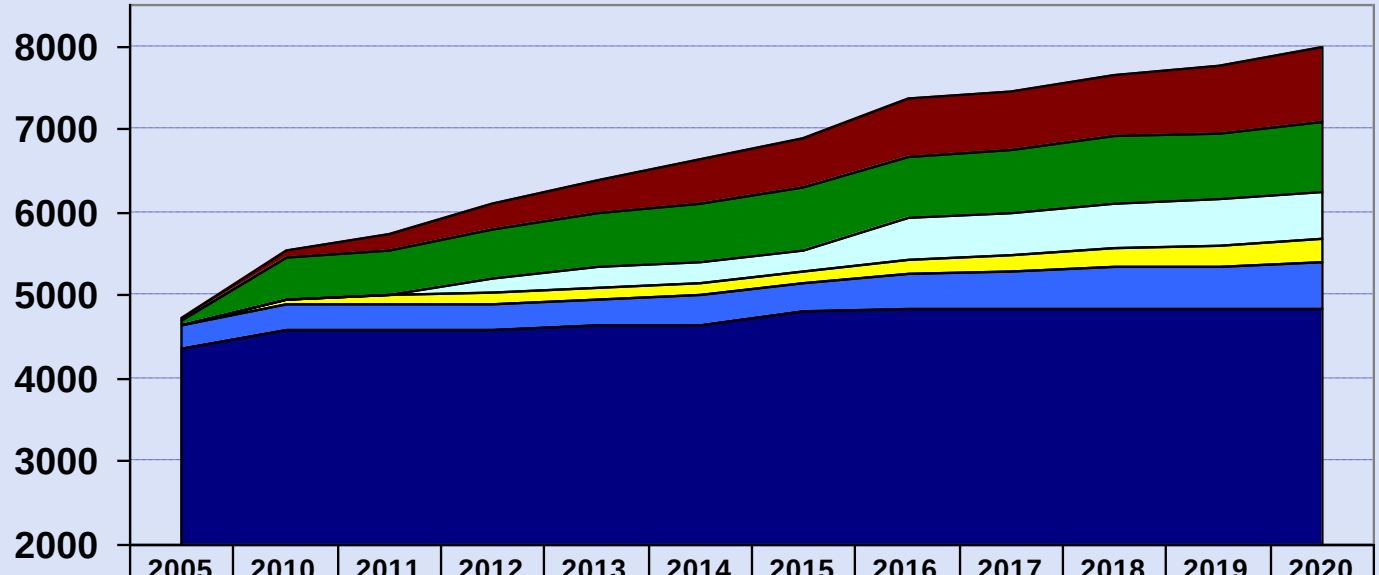
	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
heat pumps	0,1	0,1	0,1	0,1	0,1	0,1	0,2	0,2	0,3	0,4	0,5	0,7
solar	0	0	0	0	0,3	0,5	0,8	0,8	1,0	1,5	1,7	1,8
geothermal*	0	0	0	0	0,5	1,0	1,5	2,0	2,5	3,0	3,6	4,0
biogas	0	0,3	0,5	1,0	1,5	2,0	2,0	2,0	2,2	2,3	2,4	2,5
biomass	15,0	18,0	18,8	19,5	20,3	21,0	22,0	23,0	24,0	24,8	25,4	25,8

*without heat pumps

1.4 National Action Plan for energy from RES (4)

Prognosis of electricity production from RES

(GWh)



	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
biogas	10	100	200	300	400	550	600	700	700	750	800	900
biomass	50	500	550	600	650	700	750	750	750	800	800	850
wind	1	1	1	150	250	250	250	500	500	550	550	550
photovoltaic	1	50	100	150	150	150	150	175	190	210	250	300
hydropower ≤10 MW	300	300	300	300	300	350	350	400	450	500	500	545
hydropower >10 MW	4355	4600	4600	4600	4650	4650	4800	4855	4855	4855	4855	4855

1.5 Current measures to support RES

Measure	Kind of measure	Expected result	Target group
Mandatory blending of bio-components	regulatory	increased use of RES in transport	producers of motor fuel
Promotion of the use of RES in a business sector	financial (EU funds)	electricity and heat production from RES	investors
Promotion of the use of RES in households	financial	installation of biomass boilers and solar thermal collectors	households
Promotion of the production of electricity (feed-in tariffs)	legislative	increase electricity production by 2.5 TWh	investors
Promotion of the production of biomethane	regulatory	use of agricultural biomass	investors

1.6 Measures to support RES defined in Energy Efficiency Action Plan for 2008-2010

Measure	Kind of measure	Expected result	Target group
Guarantee of compulsory purchase of biomethane	legislative 2011	biomethane production volume of 60 ktoe	investors
Promotion of fast growing trees	regulatory 2011	increase of biomass supply	agricultural enterprises
Growth in production of raw wood	regulatory 2011	increase of biomass supply	agricultural enterprises
Mandatory use of renewable energy in new and renovated buildings	regulatory 2012	heat production from RES	architects/designers

1.7 Measures to support RES defined in Energy Efficiency Action Plan for 2011-2013

Measure	Kind of measure	Expected result	Target group
Promotion of the reconstruction of heat distribution lines	financial (EU funds) 2014	energy savings, promotion of the district heating	investors
Promotion of the use of RES in the business sector	financial (EU funds) 2014	heat production from RES	investors
Promotion of the use of RES for heating and cooling in public buildings	financial (EU funds) 2014	heat and cold production in public buildings	public sector

1.8 Progress in the use of RES in the Slovak Republic

RES		2005	2009	2010	Target 2010
Produced heat and cold	(PJ)	15,7	22,2*	22,9**	19,0
Produced electricity	(PJ)	16,9	18,5	19,0	19,7
Transport	(PJ)	0,4	3,2	3,7	3,8
Total	(PJ)	33,0	43,9	45,7	42,5

* 21,4 PJ from biomass

** 22,3 PJ from biomass

Produced electricity from RES

		2005	2009	2010	Target 2010
Biogas	(GWh)	10	22	32	100
Biomass	(GWh)	50	515	636	500
Wind	(GWh)	1	6	6	1
Photovoltaic	(GWh)	1	0	11	50
Hydropower ≤10 MW	(GWh)	300	256	265	300
Hydropower >10 MW	(GWh)	4 355	4 344	4 347	4 600
Total	(GWh)	4 717	5 143	5 297	5 551

2.1 District heating systems in the Slovak Republic (1)

Slovakia has developed district heating systems (DH). DH provides nearly 54% of the total heat demand of 189 PJ in Slovakia.

The heat price for consumers is regulated by Regulatory Office for Network Industries. In 2011, there was 330 heat suppliers subject to the heat price regulation.

Over the past 10 years there has been a substantial reduction in production and supply of heat in the range of 30-40% for following reasons:

- **termination of heat supply to industrial users of heat,**
- **heat energy savings in heat and domestic hot water supply by implementation of measures for the rationalization of energy consumption (demand side),**
- **energy savings by implementation of energy efficiency measures in heat production facilities (supply side).**

2.1 District heating systems in the Slovak Republic (2)

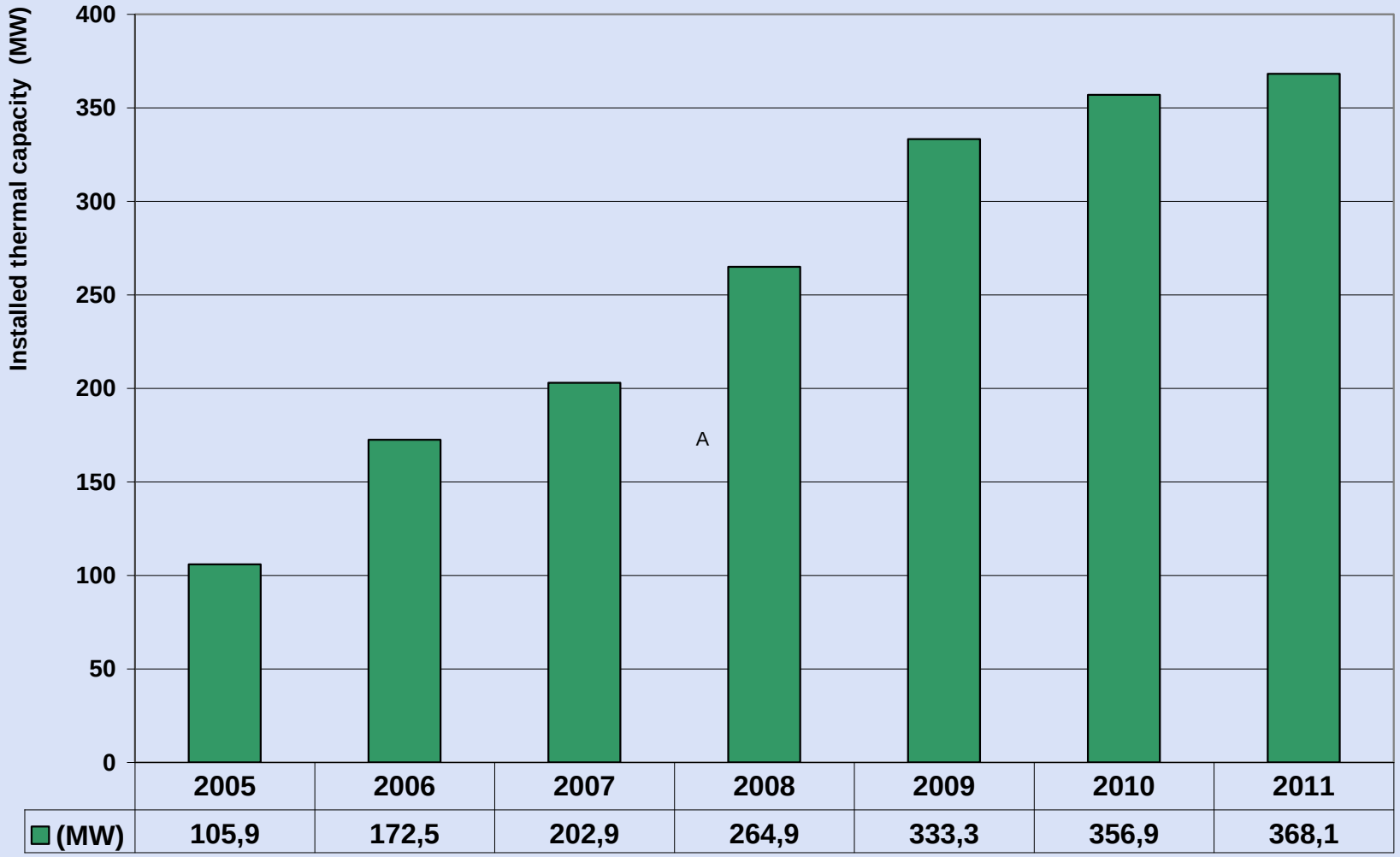
By reducing the heat supply in recent years, heat sources (CHP plants, heating plants, boiler rooms) as well as heat distribution networks has become over-sized, which has a negative impact on:

- **increasing of the proportion of fixed costs of heat suppliers to a total heat price,**
- **decreasing of competitiveness and increasing of customers trends for disconnecting from the district heating.**

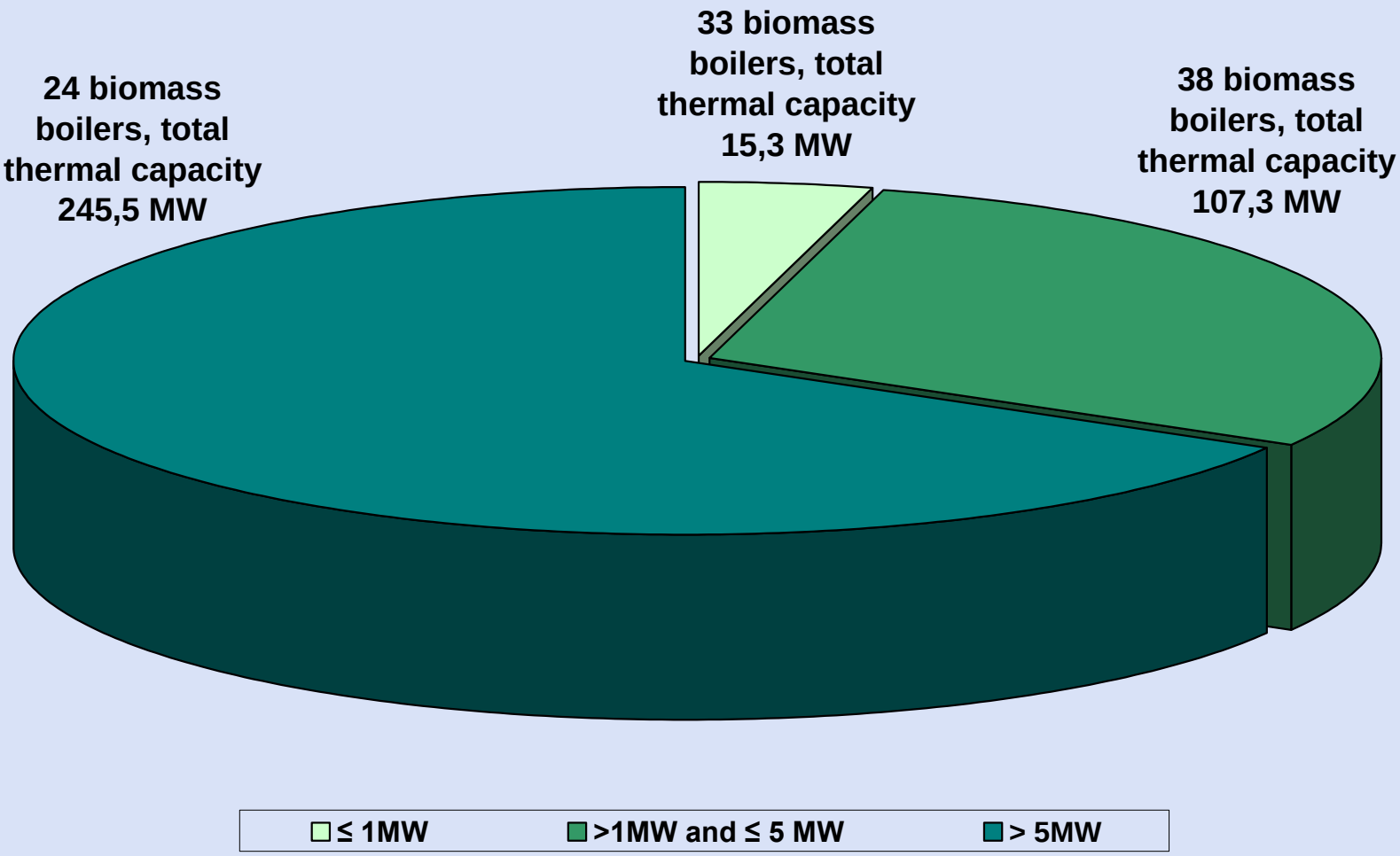
Diversification of fuels used in district heating system by use of biomass has a positive impact on two levels:

- **environmental (reduction of CO2 emissions),**
- **economic (elimination of price growth and subsequent stabilization of heat prices, increased energy security).**

2.2 Development of biomass sources in the district heating systems



2.3 The share of biomass sources according to installed thermal capacity

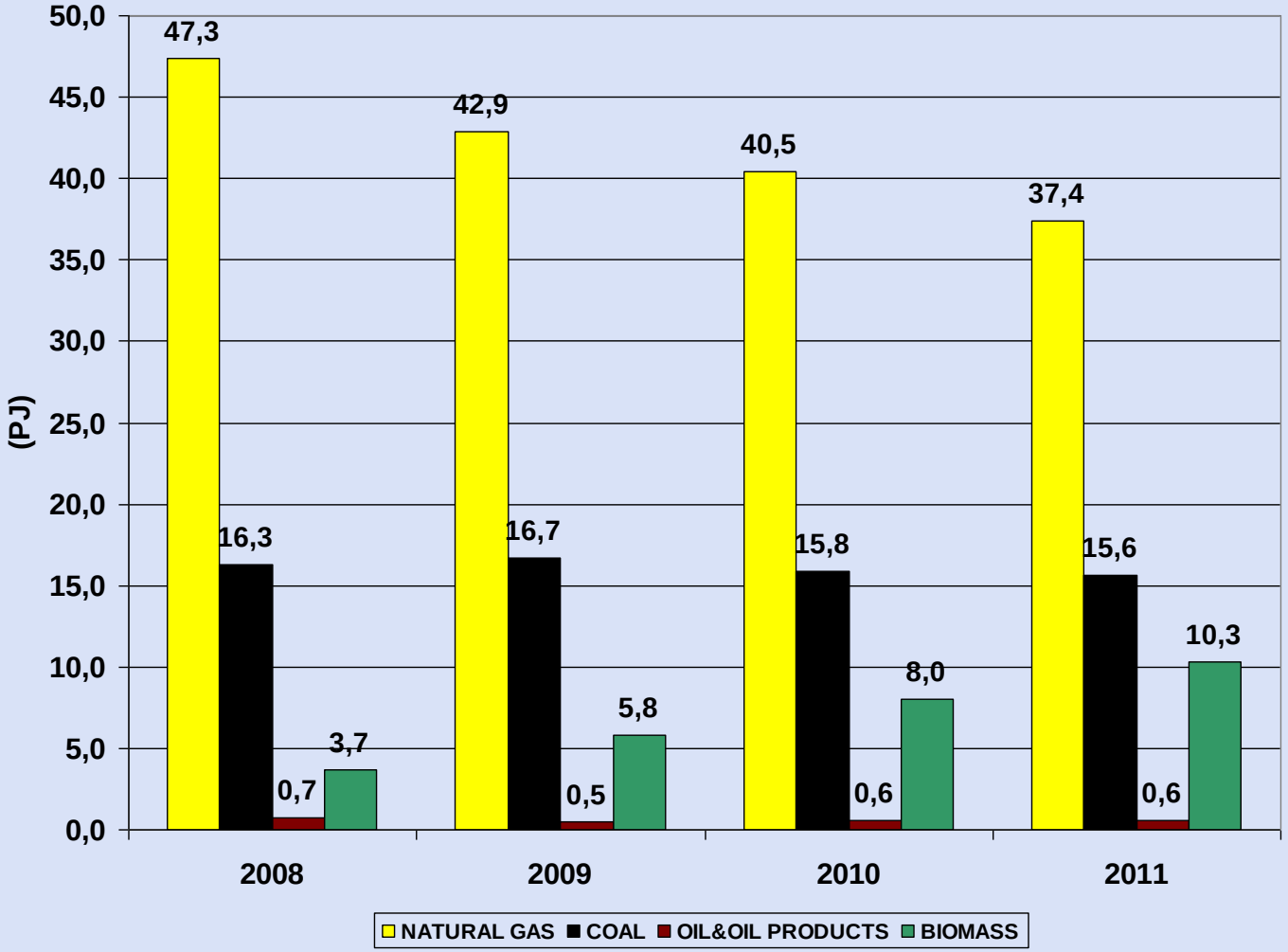


2.4 The share of primary fuels for heat production of regulated entities (1)

PRIMARY FUEL		2008	2009	2010	2011
NATURAL GAS	(PJ)	47,3	42,9	40,5	37,4
COAL	(PJ)	16,3	16,7	15,8	15,6
OIL&OIL PRODUCTS	(PJ)	0,7	0,5	0,6	0,6
BIOMASS	(PJ)	3,7	5,8	8,0	10,3
TOTAL	(PJ)	68,0	65,9	64,9	63,9

PRIMARY FUEL		2008	2009	2010	2011
NATURAL GAS	(%)	69,6	65,1	62,4	58,6
COAL	(%)	23,9	25,3	24,4	24,5
OIL&OIL PRODUCTS	(%)	1,0	0,7	0,9	0,9
BIOMASS	(%)	5,5	8,8	12,3	16,1
TOTAL	(%)	100	100	100	100

2.4 The share of primary fuels for heat production of regulated entities (2)



3. Conclusion

Growth of fossil fuel prices, which reflected the highest price of oil reached in mid-2008, shifted the biomass as an energy alternative to the center of economic and political attention. Biomass has become a priority as it can be in many cases cost-competitive with fossil fuels.

The district heating sector in recent years has seen a significant increase in its use, which makes the assumption that in the coming years it will be most used renewable energy source.

In Slovakia, there is sufficient biomass potential to achieve the goal - 14% of energy from renewable sources in gross final energy consumption.

Thank you for your attention

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