Experiences and challenges with the implementation of RED in Poland

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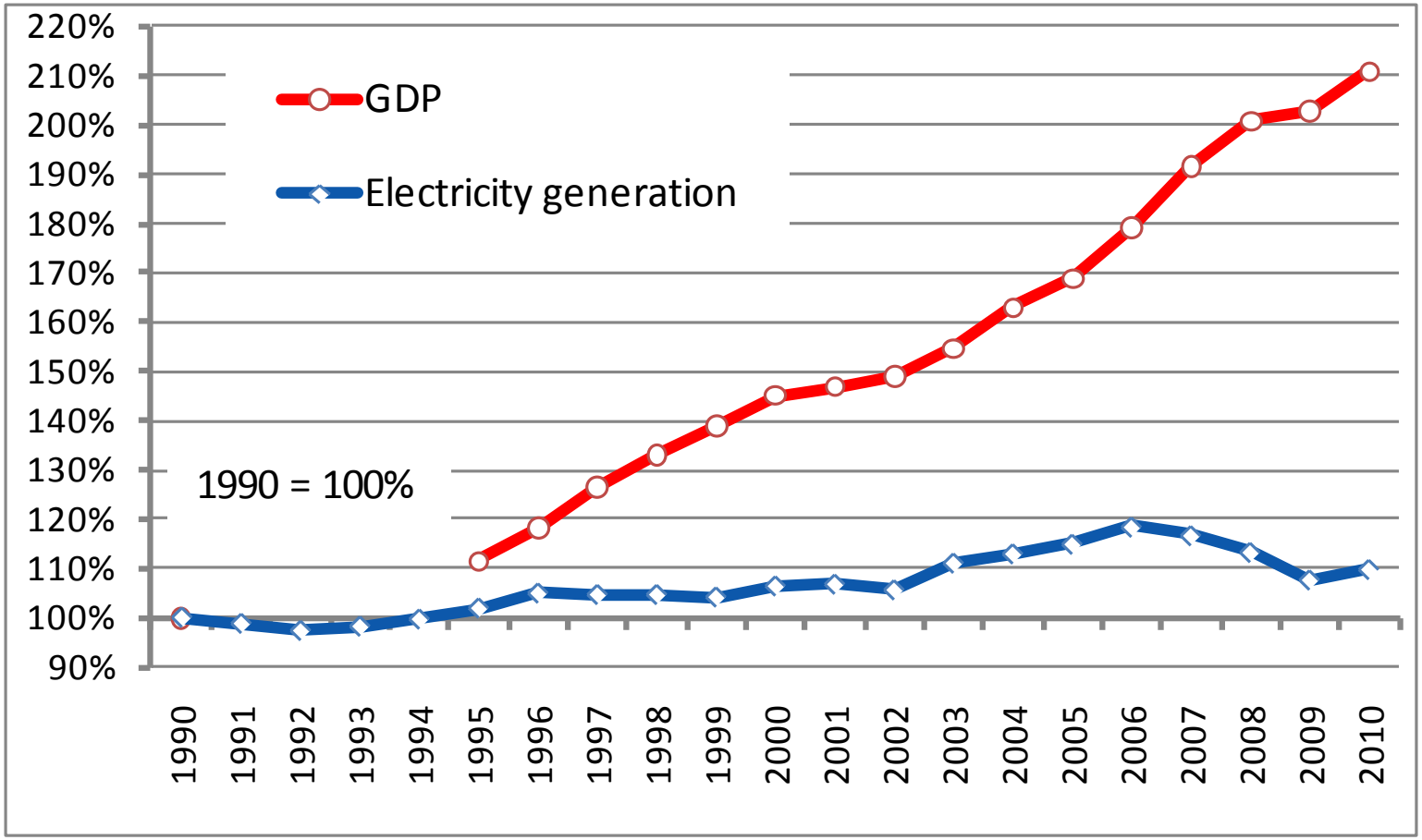
Implementation of RED in Poland

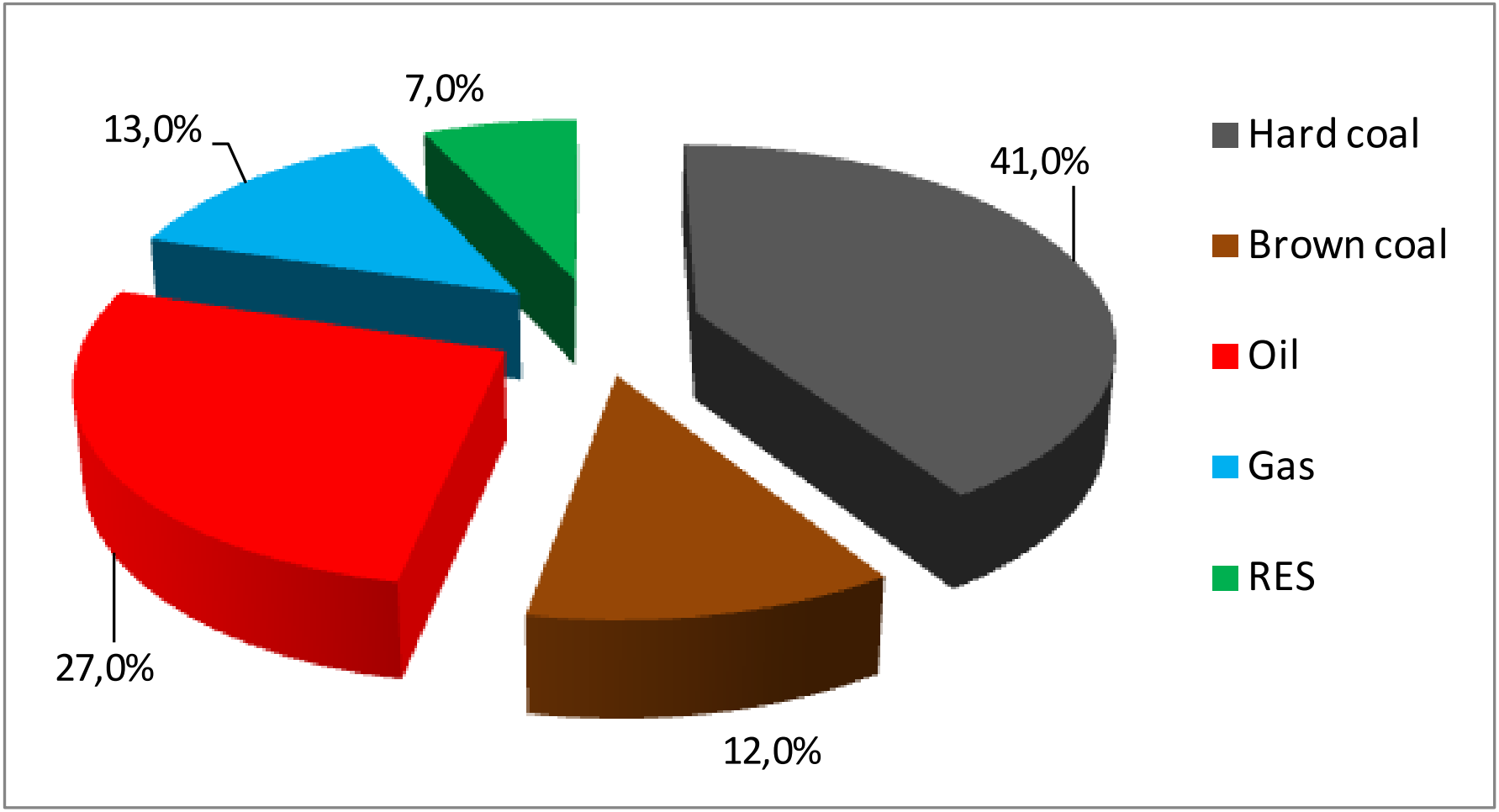
- Background:
  - Energy and heating systems based on coal
  - Low coverage of transmission and distribution grid
  - Decreasing energy intensity
  - Share of green and cogeneration electricity too low
- High potential for use of RES in energy, heating and transport sectors

Electricity generation compared with GDP

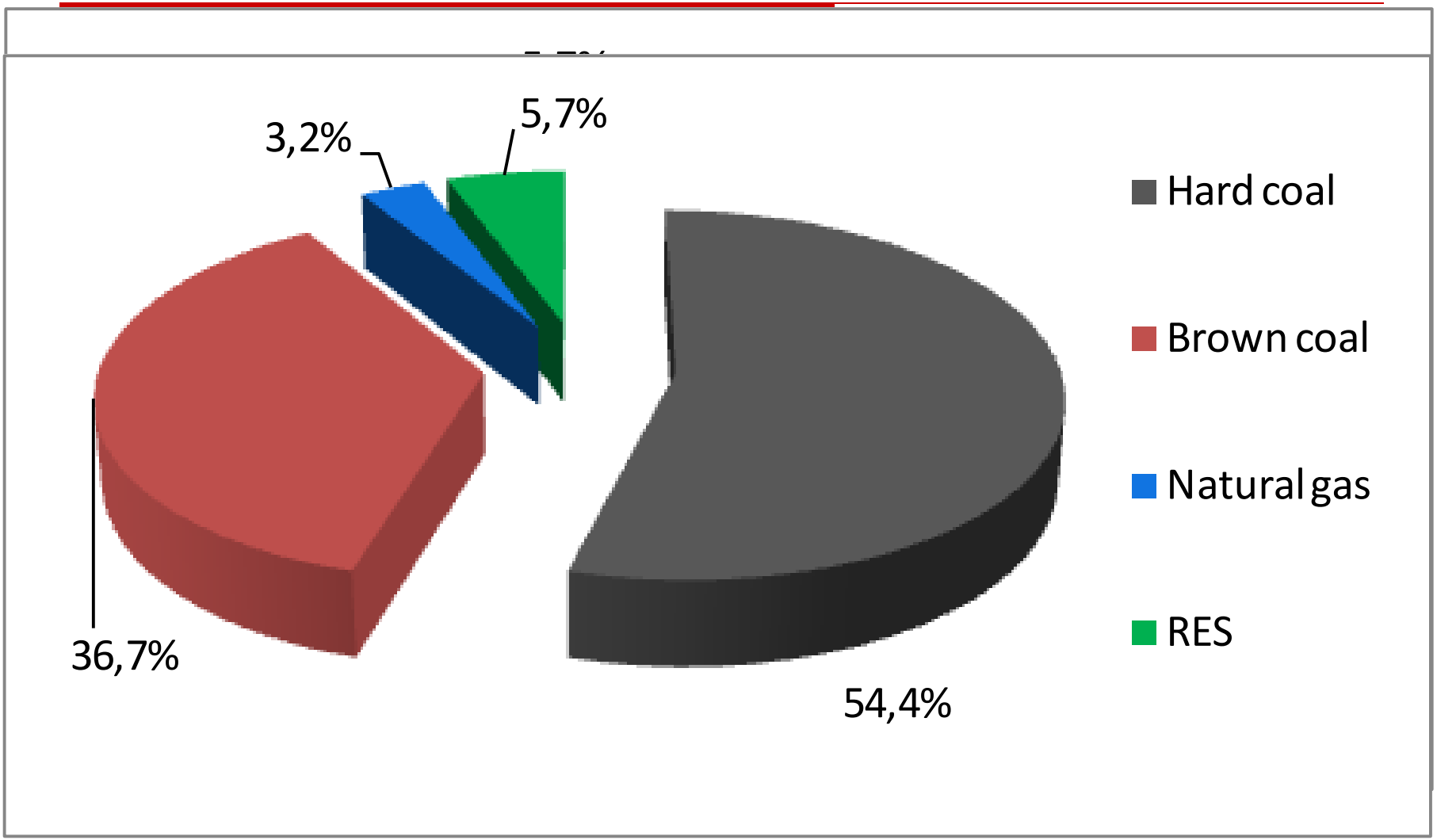


- Since the beginning of transformation constant GDP growth, over 110% in total,
- Energy use and electricity generation has increased only by10%

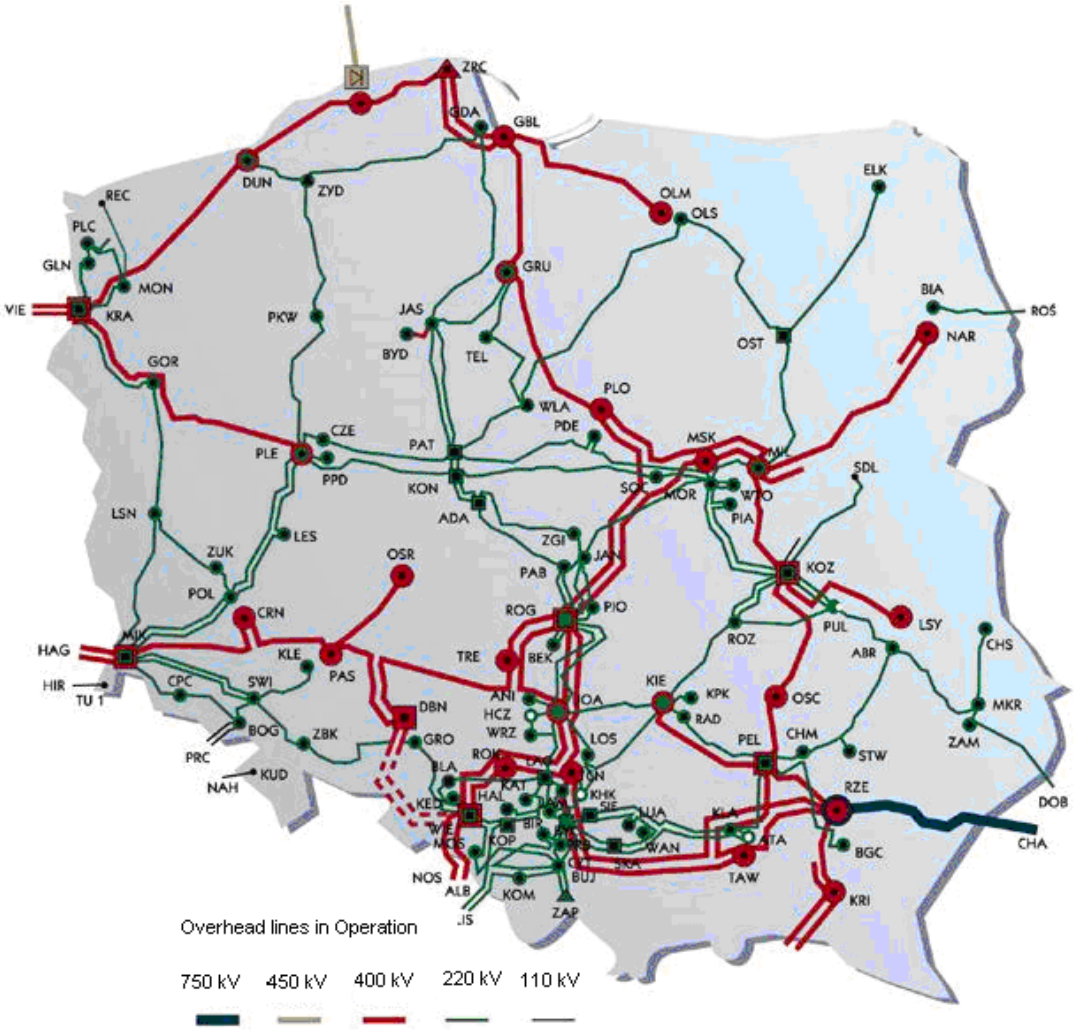
Primary energy mix (2010)



Electricity generation (2010)



The Polish transmission network



Problems and future

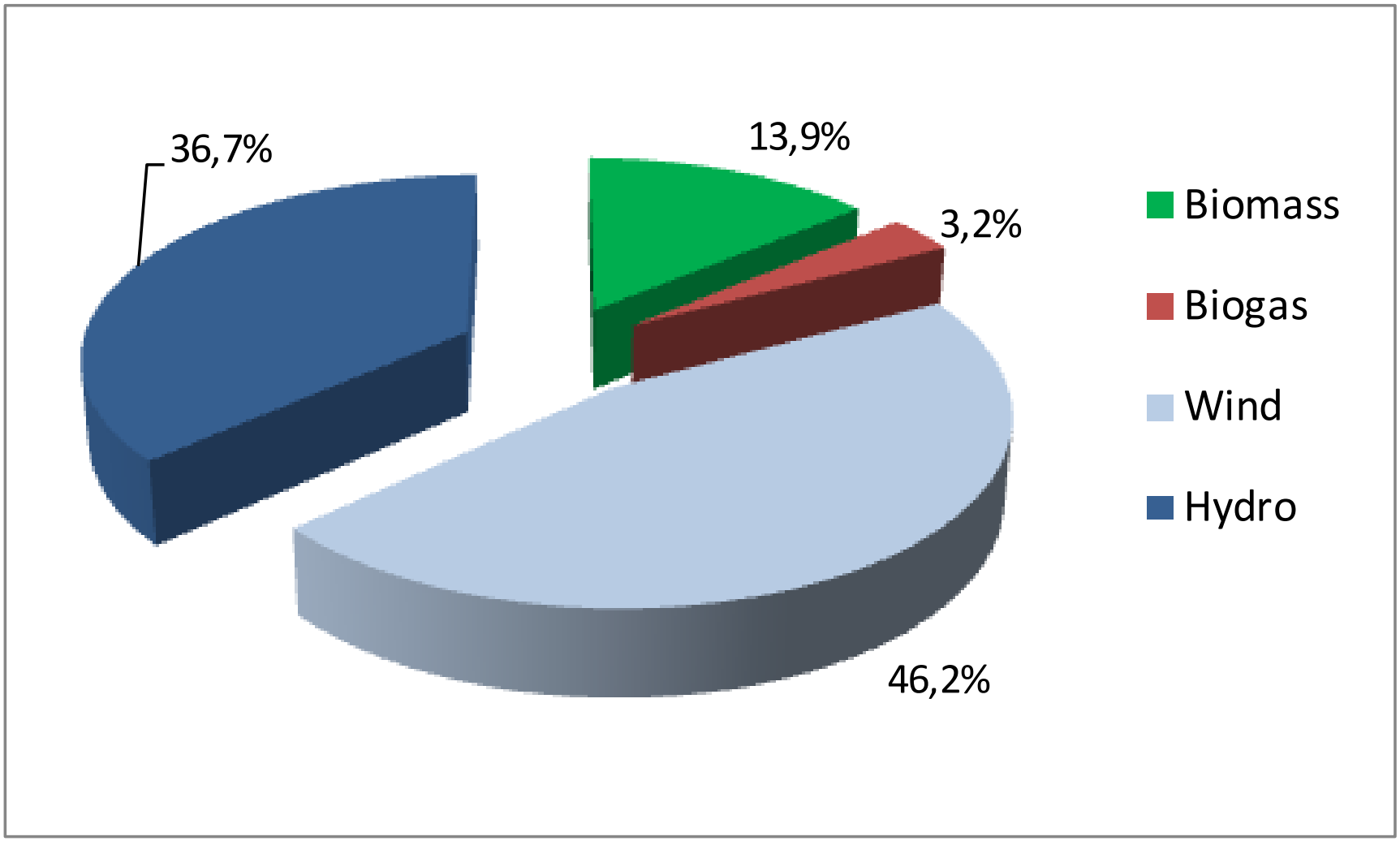
- Necessary investments in transmission and distribution (lines, compensation); increase of tariffs!
- High price of energy not fully reflected in electricity tariffs (regulated for households)
- CO2 allowances allocation too low, expected necessity of buying;
- new power plants:
  - clean coal technologies
  - CO2 sequestration
  - reduction of SO2 and NOx

Balance of fuels and energy – Poland 2010

Fuel	Fuels (physical units)	CO2 emission	Primary energy	Final energy
	unit/year	t/year	TWh/year	TWh/year
Hard Coal	80 mln ton	160.0	600.0	300.0
Lignite	60 mln ton	60.0	170.0	40.0
Natural gas	10 mld m3	20.0	100.0	84.0
Oil	22 mln ton	70.0	220.0	50.0
RES	-	-	-	**4.0**
Total	**-**	**310.0**	**1,090.0**	**478.0**
Polish goal 2020				**96 (24+72)**
Agriculture potential	**11-14 Mln ha**		**450/>850**	**360/>720**

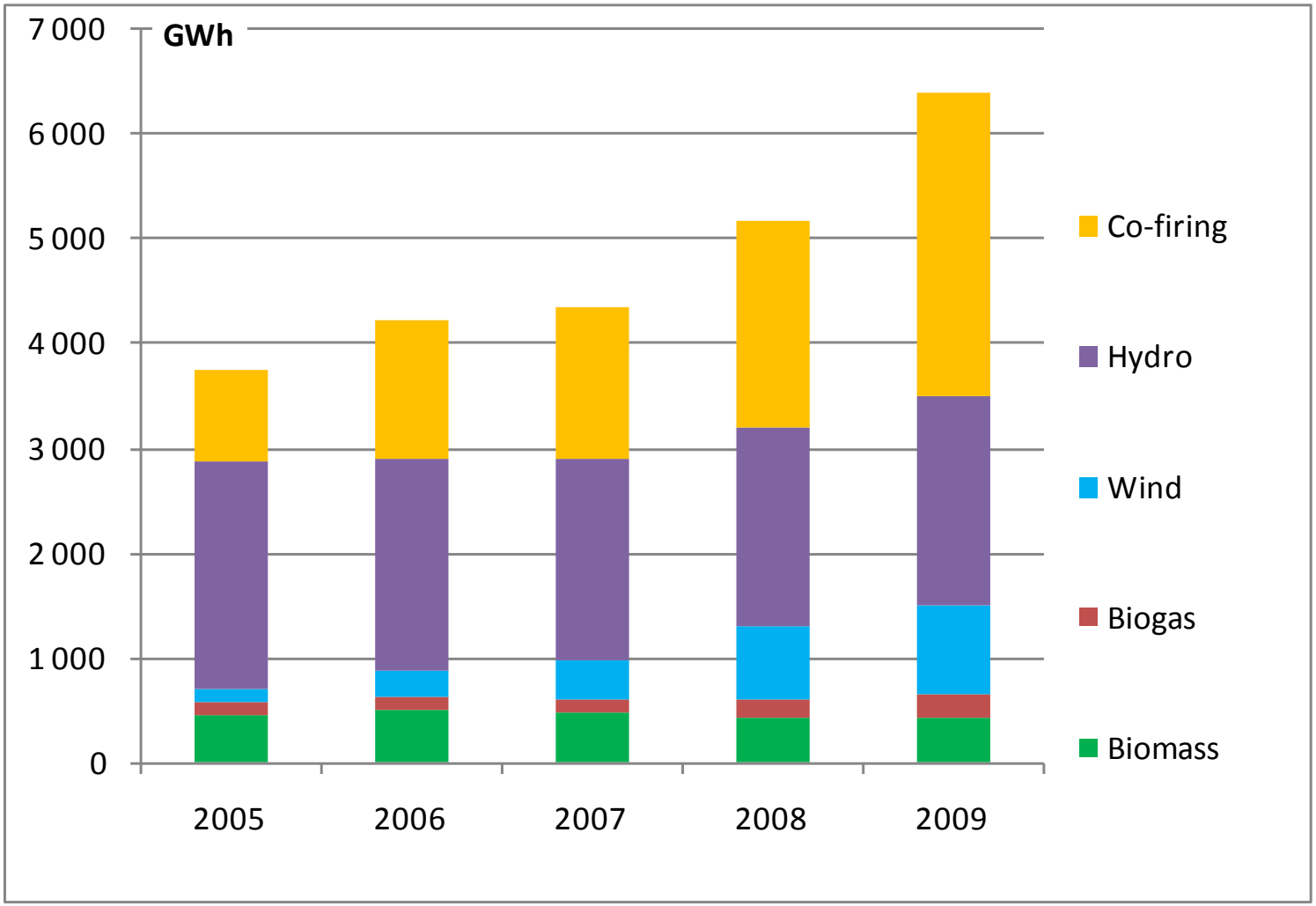
Big potential of local RES

Green electricity – installed capacity (2010)

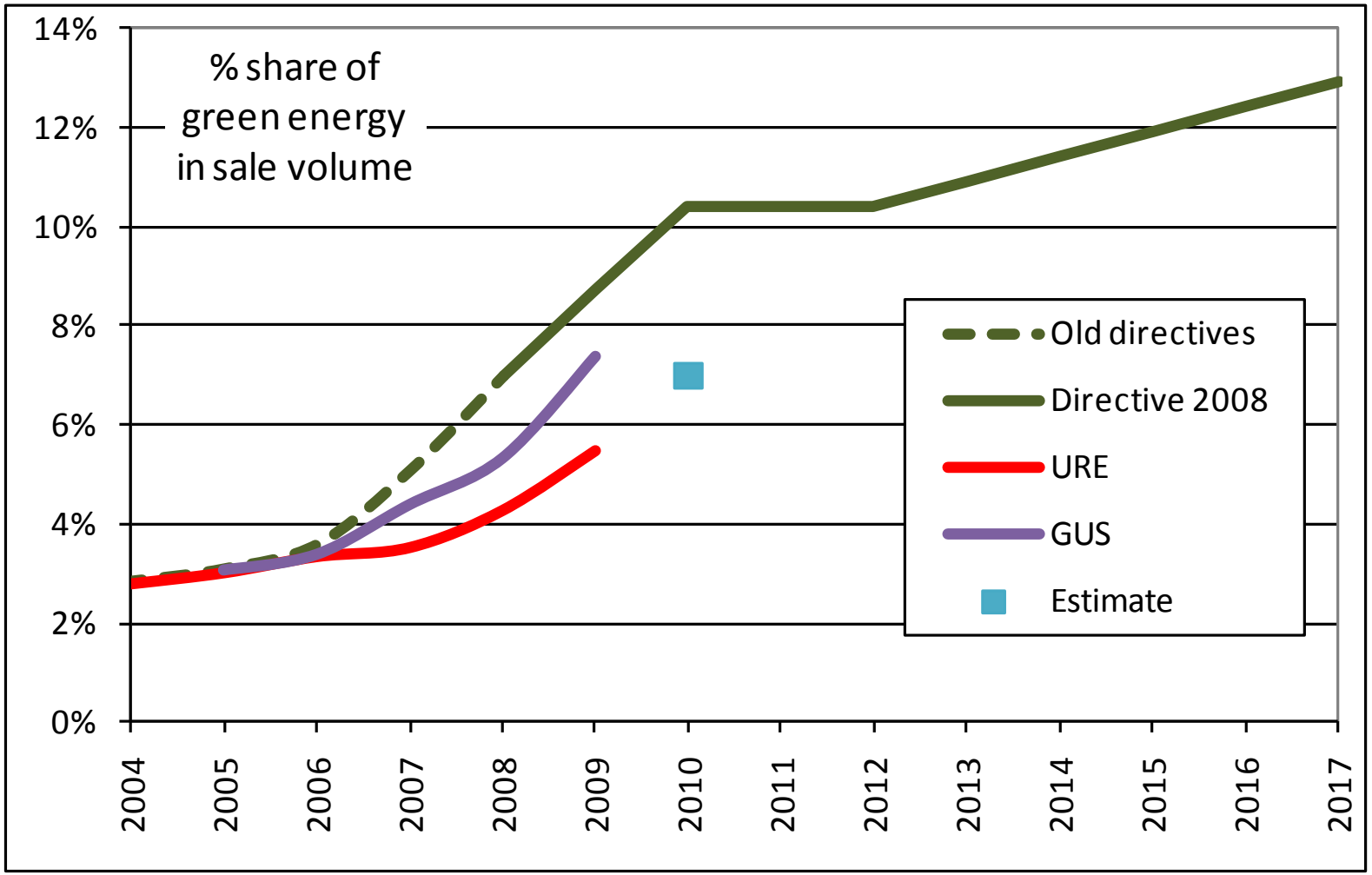


2 550 MW + about 2 000 MW in co-firing)

Green electricity (2005 - 2009)



Green electricity - plans vs. results



Share of „green" electricity reached 7-8% in 2010 (different sources) when planned level was 10.4%. Goal of 15% in 2020 can be in risk.

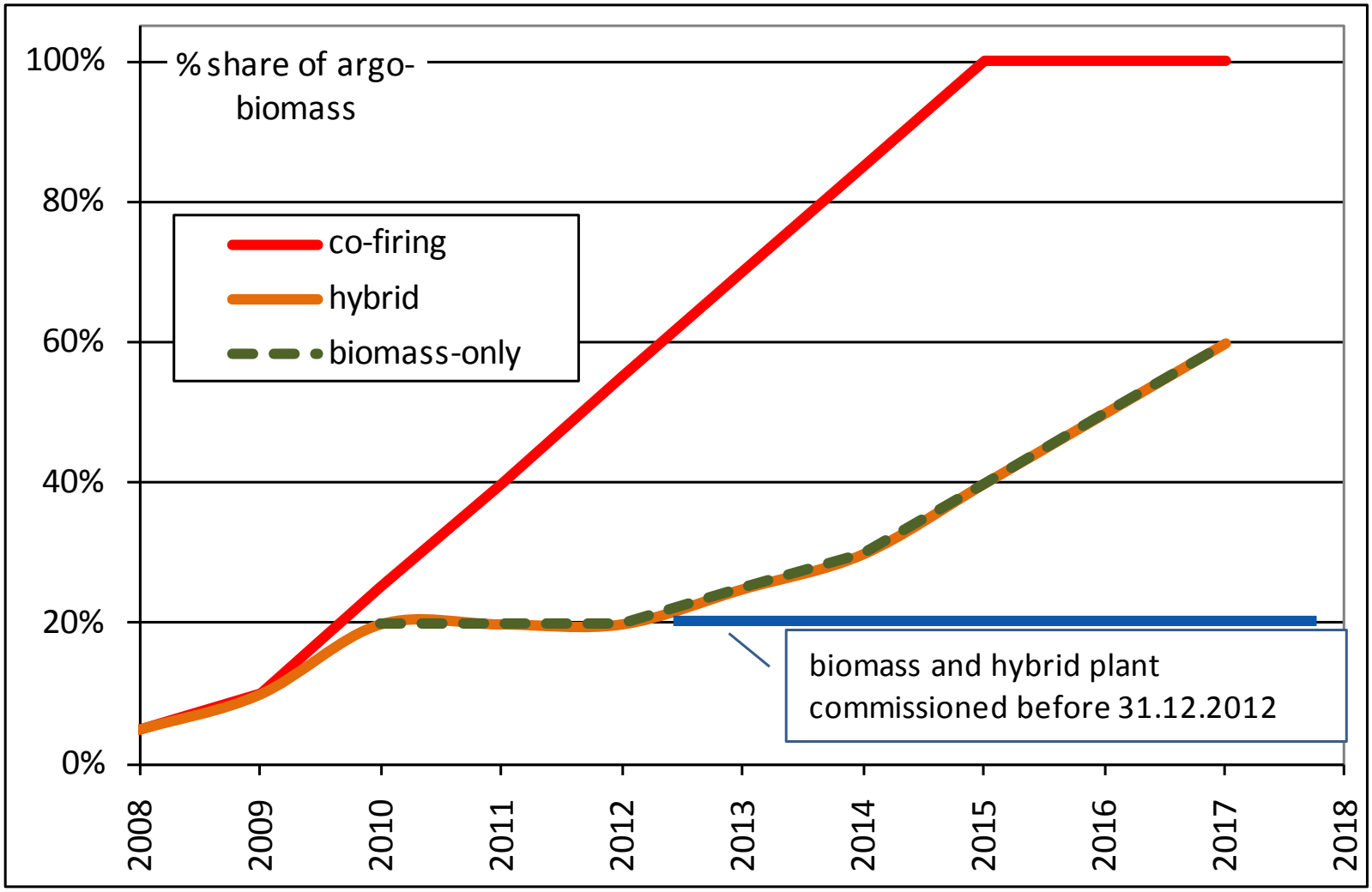
Limits applied to biomass-fuelled generation

non-forestry crops in biomass

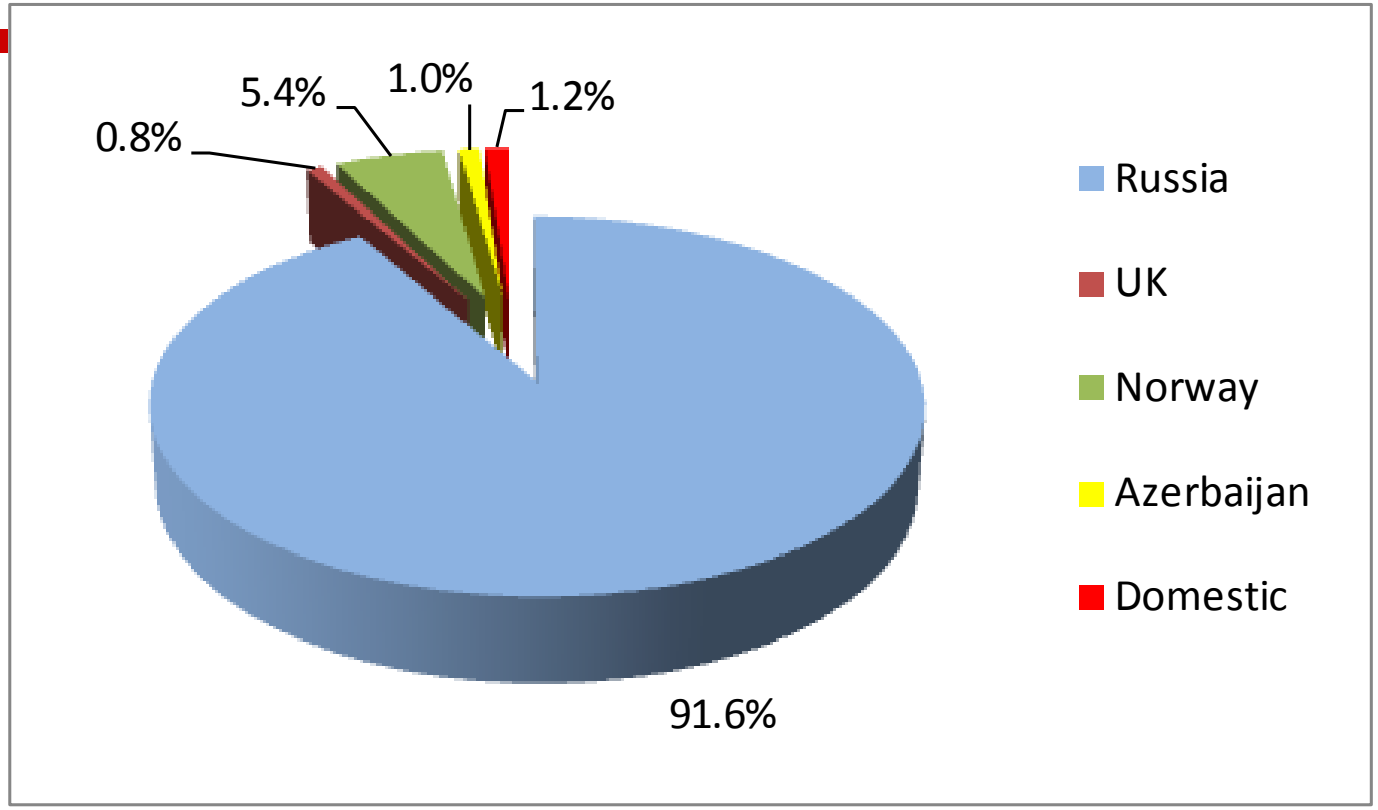
- 2008: 5%;
- 2009: 10%;
- 2010: 20%; **25%**
- 2011: 30%;
- 2012: 40%;
- 2013: 50%;
- 2014: 60%; **100%**

Limits on co-firing!!

Demanded share of agro-biomass

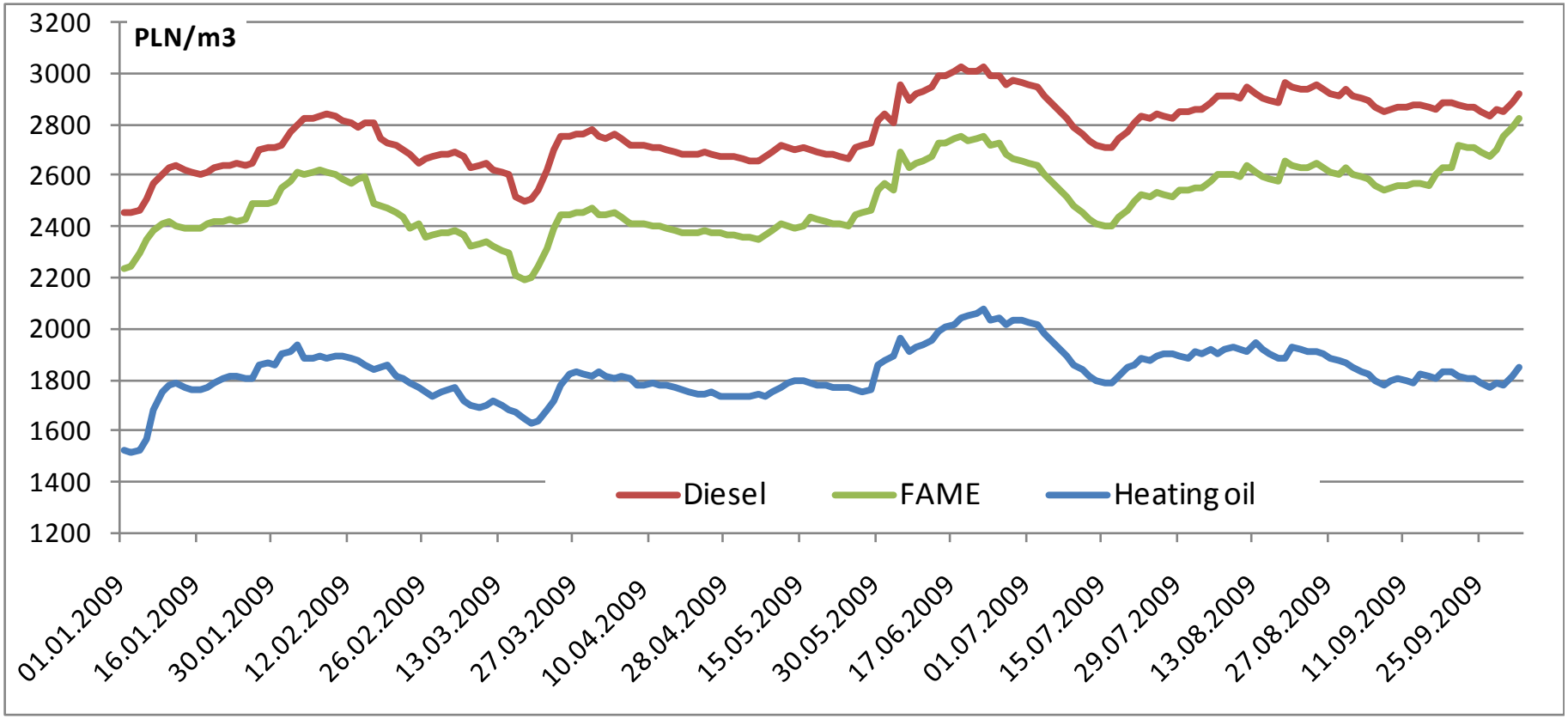


Oil



- Supply of crude oil to Polish refineries - about 20 million ton
- Vast majority of supply by pipeline systems
- 34 million ton of supply could be delivered by tankers (Gdansk harbour)

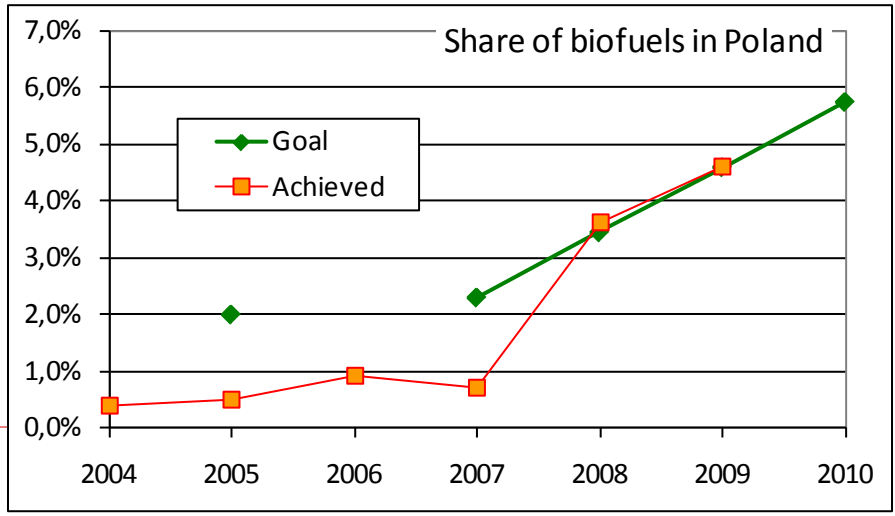
Comparison of liquid fuels price in 2009



- taxation and other duties on crude oil products
- energy input in production and distribution of FAME
- FAME producers' price policy

Liquid biofuels

- Target set – Directive 2003/30/EC
- blending of bio-components till 5% permitted, few stations with B20 and B100
- presently mixing up to 5%
- production capacity sufficient
- no biofuels on wholesale market
- whole production of bio-components used for blending by big fuel companies
- penalty for not reaching the target
- bad publicity around biofuels



Support of biofuels use

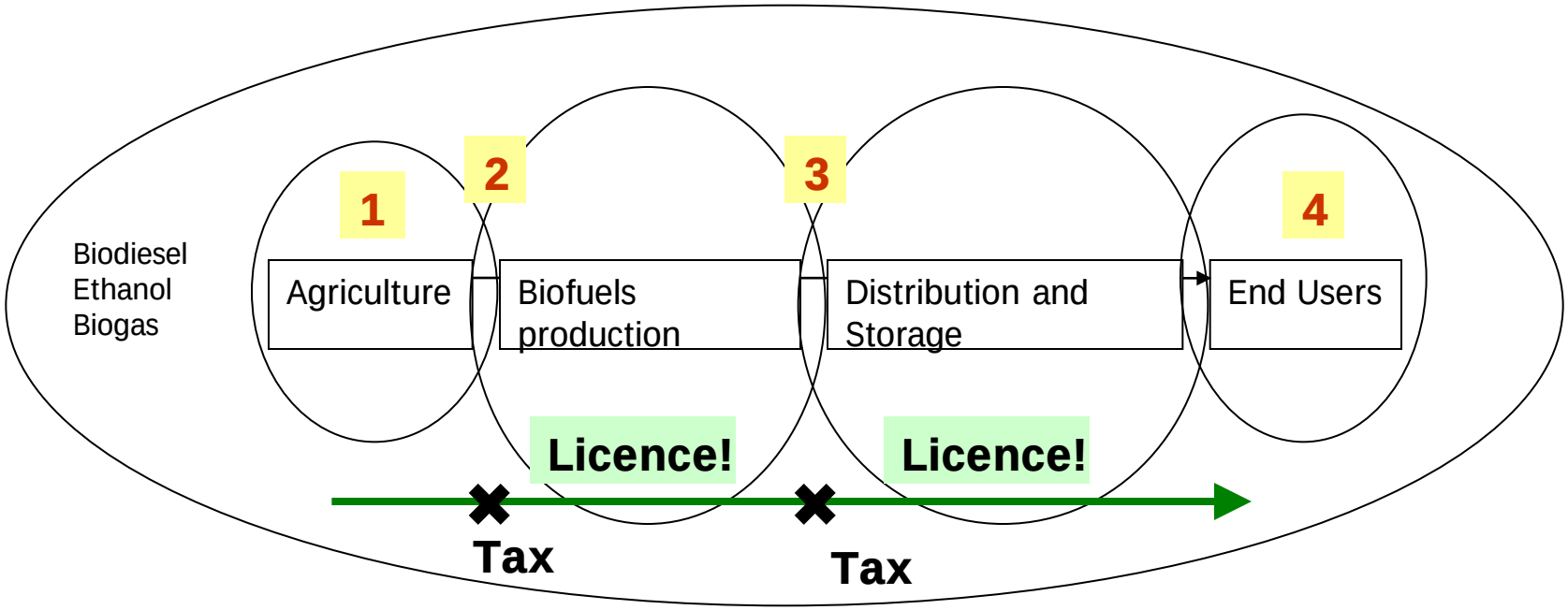
Financial incentives:

- Excise duty reduced (till 2010)
- Reduction of CIT (19%) for producers,
- Fuel tax removed (pure biofuels) or proportionally reduced,
- Support to energy plantations.

Actions to stimulate demand:

- Creation of special zones in town centres,
- Exclusion of parking fees for biofuel cars,
- Reduction of environmental fees,
- Preferences within procurement procedures (for public vehicles),
- Obligations to state administration in purchasing new vehicles, that shall be biofuels-fuelled:
  - 50% of vehicles in 2009-2010,
  - 100% of vehicles afterwards,
- R&D support, Educational activities, Public awareness building.

Biofuels chain in Poland - barriers



1. Only for own use (max 100l/ha)
2. Required long-term contracts, to get subsidies
3. All production delivered to large fuel companies
4. Possible separate fleet delivery (over 10 vehicles)

RES policy outline

Changes in RES policy 2010

- Latest RES policy has been adopted in the Energy Policy till 2020 (November 2009).
- Data from Energy Policy has been used in NREAP.

Funding of the support scheme

- Tradeable green certificates support producers.
- Retrofit investments can apply for EU, Green Investment and other soft funds support

Next policy review

- Green certificates system is planned till 2019.
- Discussion has been initiated to change this into feed-in tariff systems, different for sources. No assumptions are available.
- Typical review of policies takes place when demanded by the EU obligations

Evaluation of the RES policy

- In the opinion of the Government RES policy has been successful.
- NREAP assumes reaching the 2020 targets of 15% RES share in gross energy mix.
- Experts criticize the RES policy mainly because of: supporting non-efficient co-firing, lack of support schemes, congestion in power grid

Path to NREAP

- 25.05.2010

  Draft of the National Renewable Energy Action Plan announced and opened for inter-ministerial discussion and public consultations

- 15.10.2010

  Draft NREAP accepted by the Committee for European Affairs and sent to the Permanent Committee of the Council of Ministers

- 18.11.2010

  NREAP accepted by the Permanent Committee of the Council of Ministers and sent to the Council of Ministers

- **7.12.2010**

  Final version of the NREAP adopted by the Council of Ministers and send on 9.12.2010 to the European Commission.

Main comments to NREAP at the public hearing stage

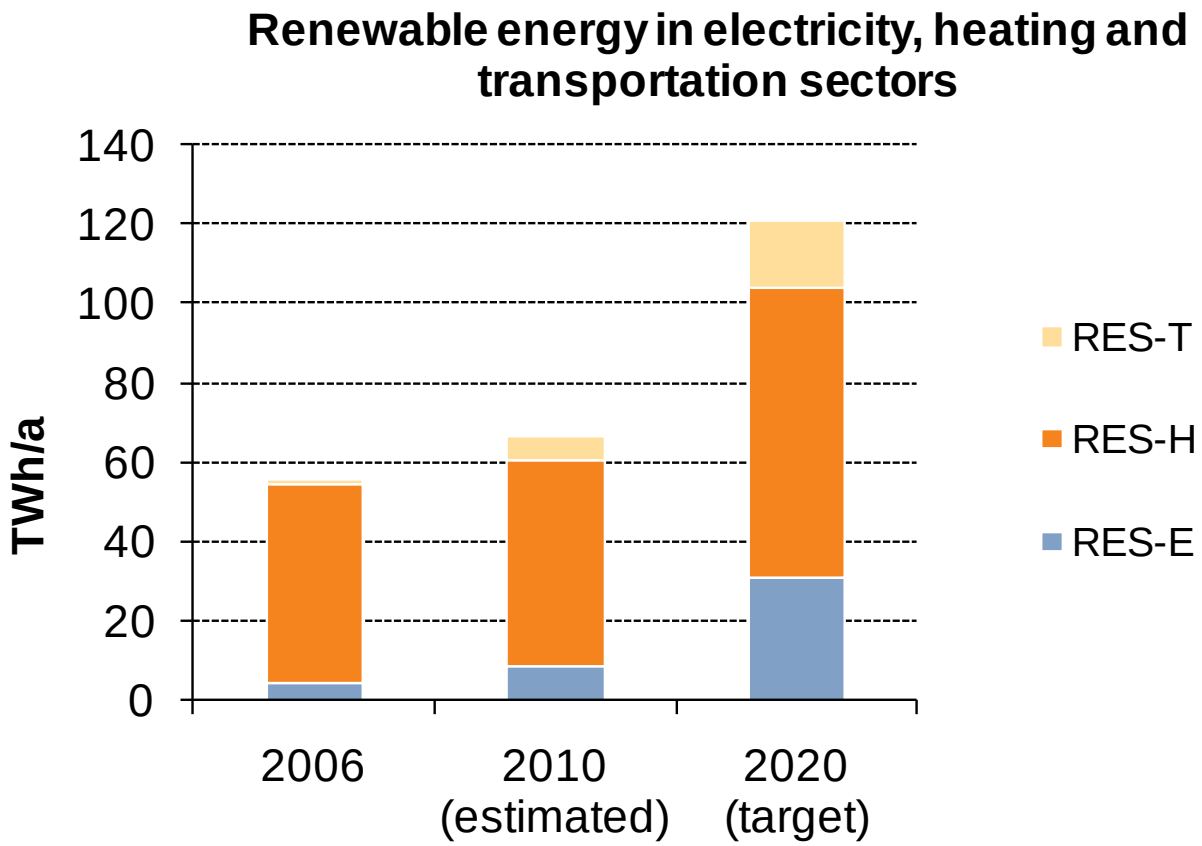
- NREAP brings present picture of RES but lacks defined actions and duties for public and private actors, at national, regional and local levels.
- Monitoring of RES use is not reliable, data according to the Energy Regulator, Polish Statistical Office and EUROSTAT differ by more than 10%.
- Reaching of 2020 goal of 15% requires active support of investments in RES, mainly biomass CHP plants, biogas plants and wind farms (onshore and offshore).
- Investment process of RES plants shall be simplified, connection to power grid eased.
- System of green electricity support (green certificates or feed-in tariffs) shall be stable and guaranteed for at least 15-20 years (presently is shorter than 10 years).

Main comments to NREAP at the public hearing stage

- Co-firing of biomass with coal shall be eliminated from the support schemes.
- Planned share of RES in energy mix shall be higher especially when energy use in 2020 shall be higher than planned.
- Connection procedures of RES sources to the power grid shall be simplified.
- Price of electricity from biomass and biogas CHP plants shall be set and not left to the Regulator decision.
- Renewable heat requires support. Price of renewable heat shall be left to supply agreements.

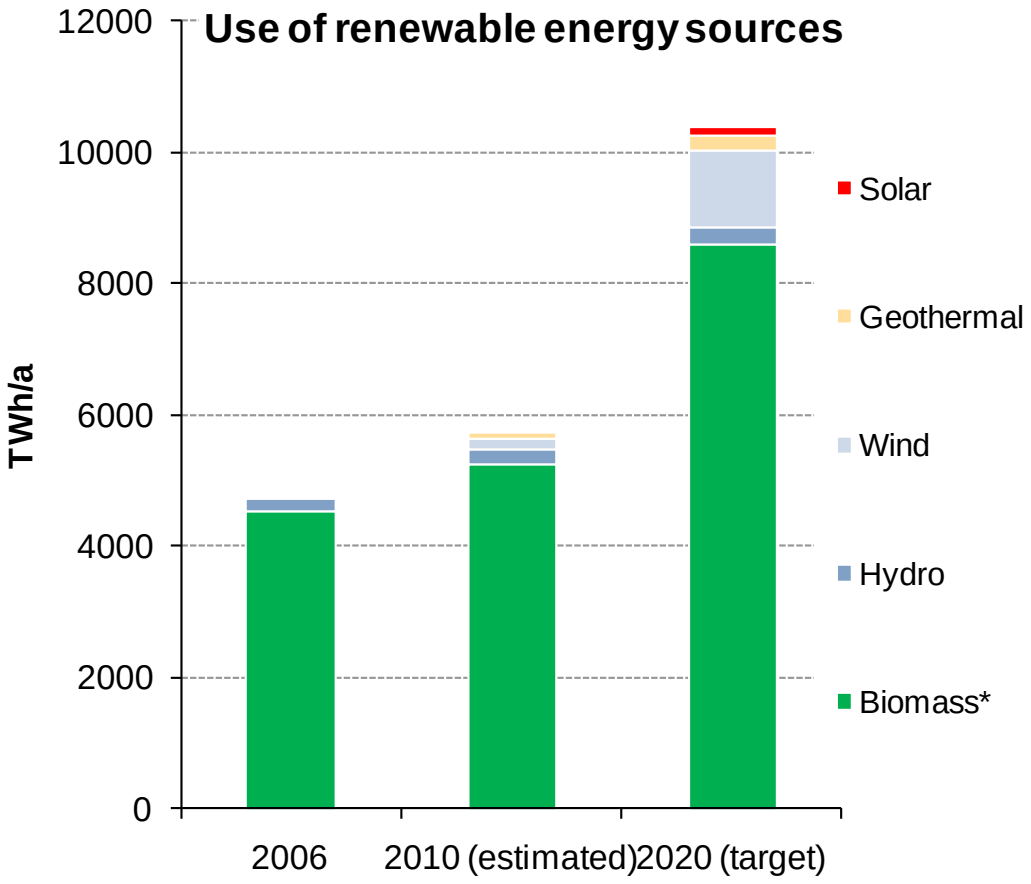
Use of RES in 2005, 2010 and 2020

- Use of renewables in total (electricity, heat and transportation sectors) for 2020 is planned to grow by 117%
- RES in heating shall remain dominant, with growing share of RES in electricity (26%) and transport (14%) sectors



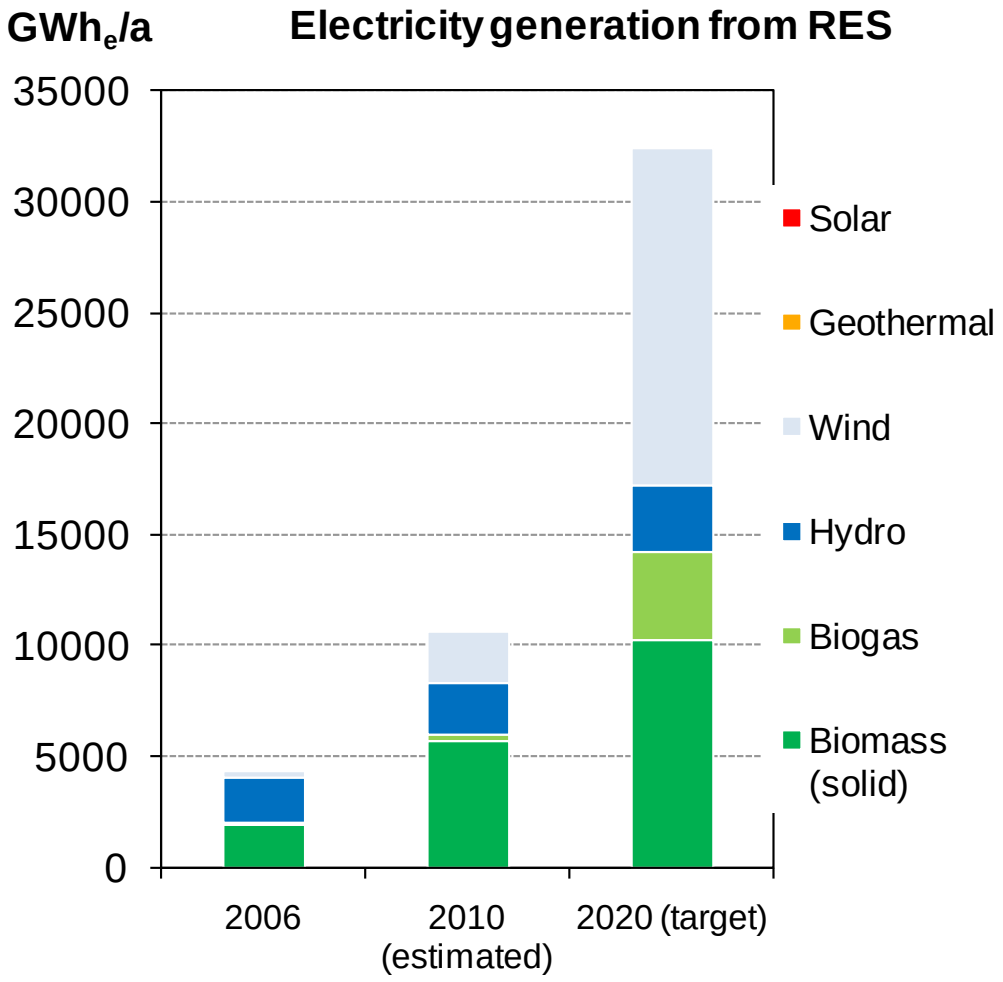
Mix of RES in 2005, 2010 and 2020

- The most important source is biomass, with expansion possibility and shift from forest to agriculture biomass (incl. biogas plants)
- Three sectors shall compete for biomass: boilers (heat, CHP, power plants), biogas plants and biofuel producers
- The biggest growth and second share shall have wind energy, mainly inland
- Growth so far has been behind schedule and the biggest share of biomass has been used in co-firing with coal in old power and CHP plants



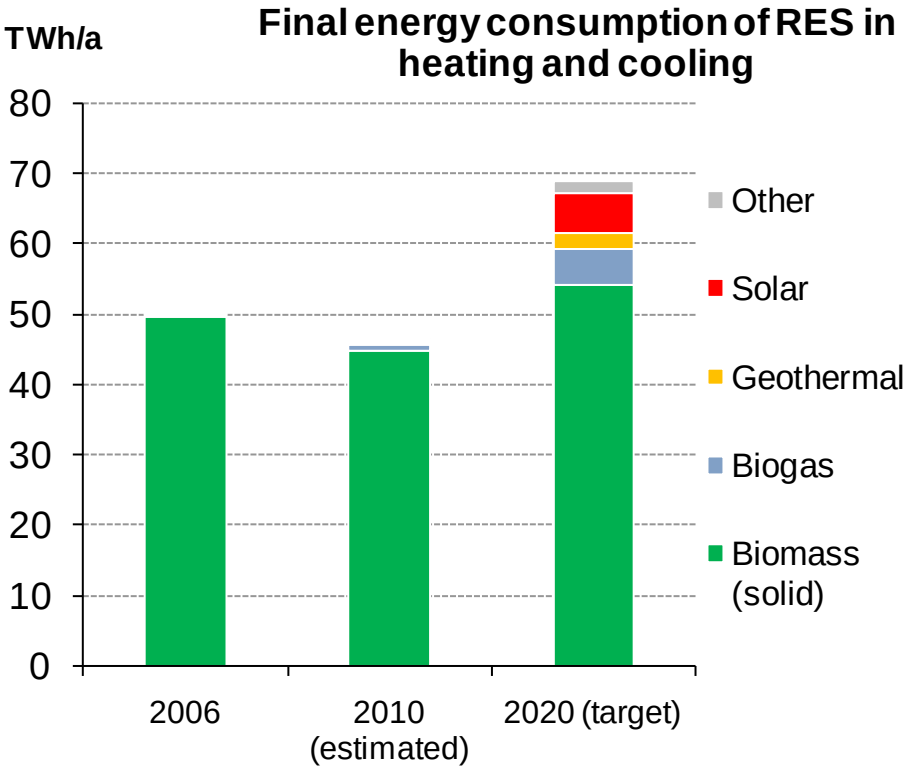
Electricity from RES

- Most important sources of RES-E now are biomass, hydro and wind.
- The biggest increase by 2020 in comparison with 2010 is planned for biogas (over 11 times) and wind energy (over 5 times)
- The biggest volume of biomass is used in co-firing with coal:
  - Share of electricity generated in co-firing reached 73% in 2006 and 85% in 2009 of all electricity generated from biomass;
  - co-firing is supported by the general renewable energy support scheme;
  - increasing number of public power and CHP plants introduce co-firing;
  - co-firing shall be restricted by introduction of gradual decreasing of forest biomass share in biomass for co-firing



Heat from RES

- Presently nearly all biomass for heating has forest origin (wood residuals and waste from wood industry).
- The biggest share of forest biomass is used as fuel wood in stoves and boilers.
- Renewable heat competes with cheap coal. Price of heat from biomass is higher than heat from fine coal.
- Locally woodchips and pellets compete with oil and LPG.
- There is an obligation for a DH company to purchase renewable heat from an independent producer. This obligation has not been functioning because price of heat for end-users cannot be increased and network operation typically does not allow for multi-source supply.
- There are not specific support mechanisms to renewable heat. DH companies purchase biomass heat only from CHP plants (income from green certificates allow for supplying cheaper heat).
- Operators can apply for special environmental funds for retrofits (EU funds, Green investment Scheme support, others) for investments in biomass HOB plants.



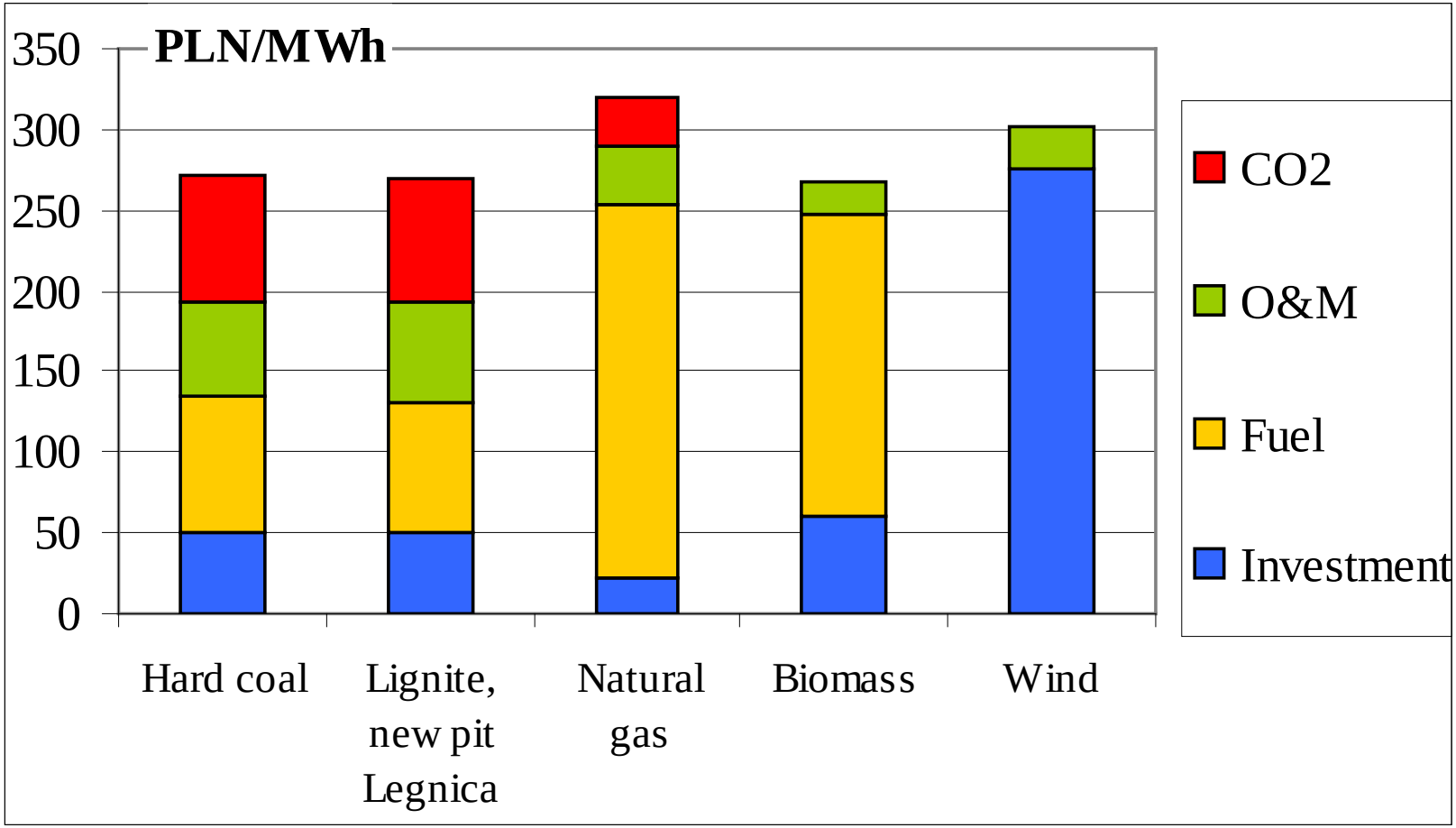
Biomass supply

Biomass supply (TWh)

	2006		2015		2020	
	domestic	net import (+) / net export (-	domestic	net import (+) / net export (-)	domestic	net import (+) / net
Biomass from forestry	49	0	23	<0	24	<0
Biomass from agriculture and fisheries	5	0	21	0	34	0
Biomass from waste	1	0	13	0	20	0

- Information on biomass volumes summarised in NREAP is not present in the statistics, the estimates base on sources from forestry, agriculture etc.
- Share of forest biomass supply shall be lower due to growing demand from other industries and expected tightening of environmental legislation, including NATURE 2000
- The growing supply is expected from agriculture and waste sectors. Agriculture biomass (straw, energy crops) supply increase shall result from higher yields, better use of land and shift from food production to energy supply. Imposing of waste management shall result in higher volumes of municipal and biodegradable industrial waste.
- Farmers get gradually reduced subsidies for energy crops, within the EU CAP
- There is expected net export of biomass fuels (pellets, biofuels), totally about 3% of RES.

Electricity costs for new power plants



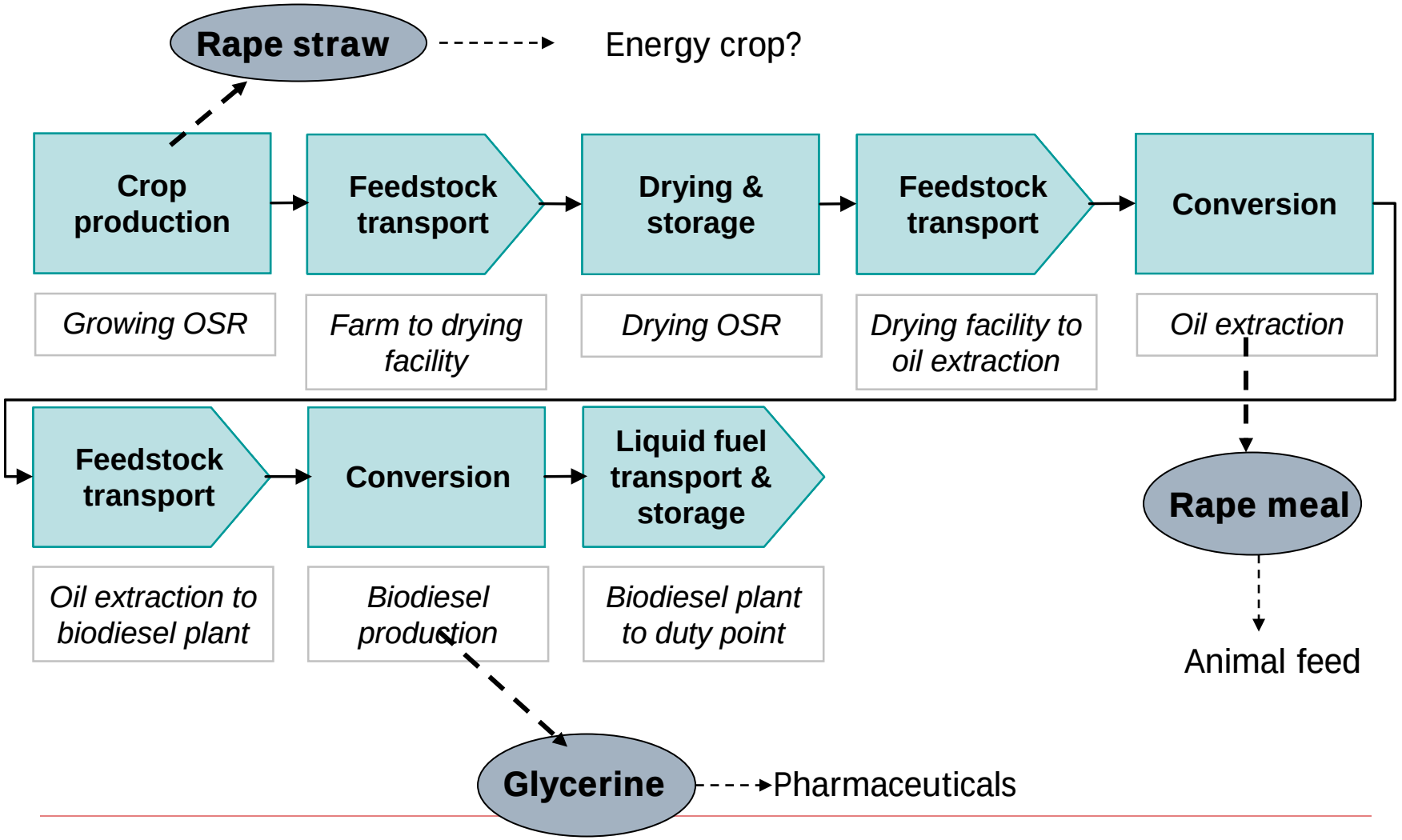
Study by MSP - Ministry of the Treasury, press release Jan. 2008

Biofuels - key sustainability aspects

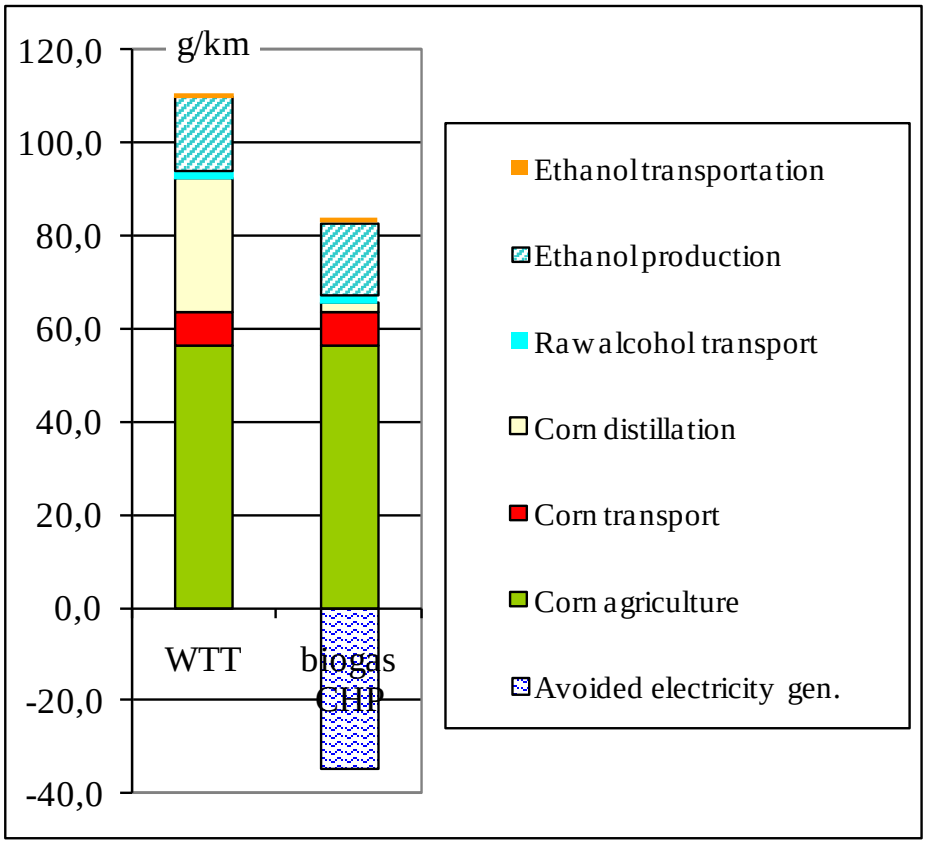
- Environmental
  - Carbon storage
  - Conservation of biodiversity
  - Soil conservation
  - Sustainable water use
  - Air pollution
- Social
  - Labour conditions and human rights
  - Land ownership and community rights

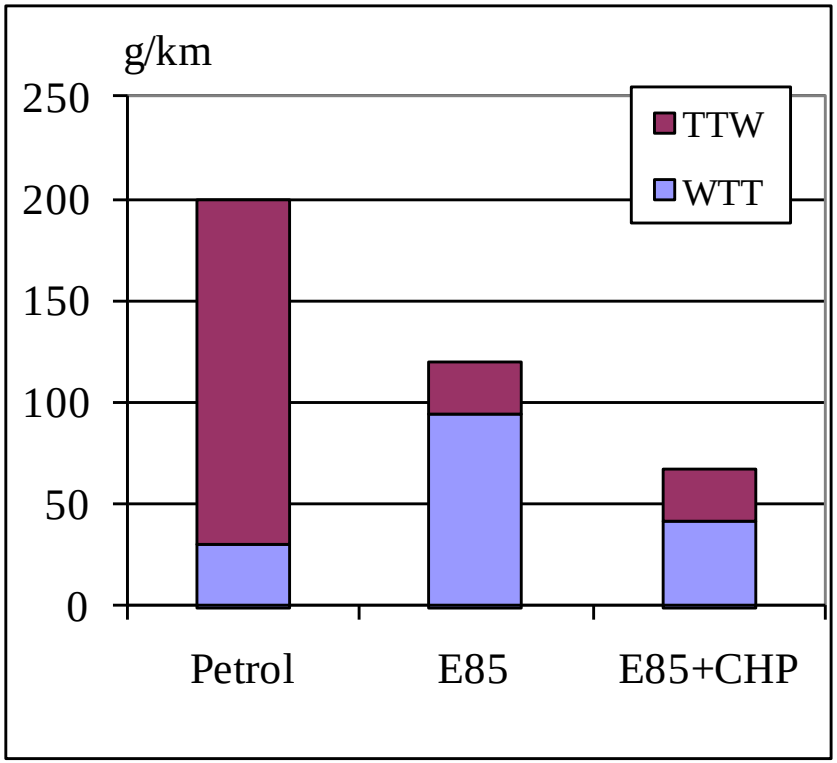
IEE BioNETT project – stimulation of local biofuel markets

Biodiesel from rapeseed oil



Simplified LCA tool





Simplified training tool on has been developed within BioNETT to demonstrate reduction of GHG emissions when converting public fleets to biofuels.

Conclusions

- RED has been implemented in Poland however with delay and problems
- Transformation of Polish economy to „green” performance requires efforts and financial backing
- Renewable energy is supported, structure of RES generation mix requires change
- Polish potential for biofuels production is high, national targets are reached; surplus can be delivered to other EU MS
- Required R&D and involvement of NGO’s