

Supporting modernisation of local Polish energy systems with Swiss technologies



**Bałtycka Agencja Poszanowania
Energii S.A.**

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Contents of the presentation

- Situation on RES including biomass in Poland
- Electricity and heat from RES
- Penetration of RES at different levels:
 - Power sector
 - DH companies
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 - Individual users
 - Examples of working installations
- Necessity of support local initiatives
 - Gasification of biomass
 - Biogas plants
 - Small-scale wind energy
- Potential for Swiss technologies support



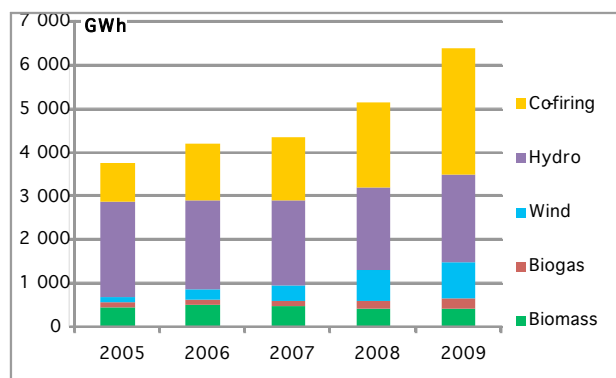
Implementation of RES in Poland

- Following EC commitments – with delays
- Local specifics – cheap coal, used for:
 - Power and CHP generation
 - Heat production in DH systems
 - Local HOBs
 - Individual boilers and stoves – final fuel!
- Lack of funds to invest in modernisation of heat systems



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Green electricity



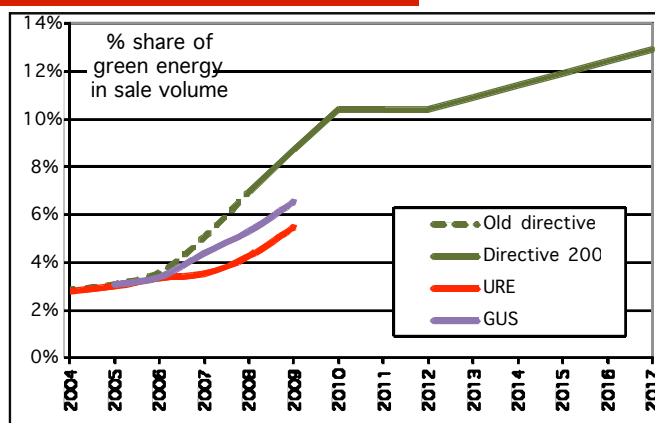
The biggest increase of generation from RES:

- Co-firing in big-scale plants
- Wind farms



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Still behind plans ...



Different source data: URE – regulator, GUS – statistical info from power sector



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Incentives

- Electricity - system of certificates:
 - Green – RES
 - Yellow – gas and small-scale cogeneration
 - Red – cogeneration
 - From 2010 – possibility of combining certificates
- Heat – no support
 - Only obligation to purchase by DH company



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Power sector

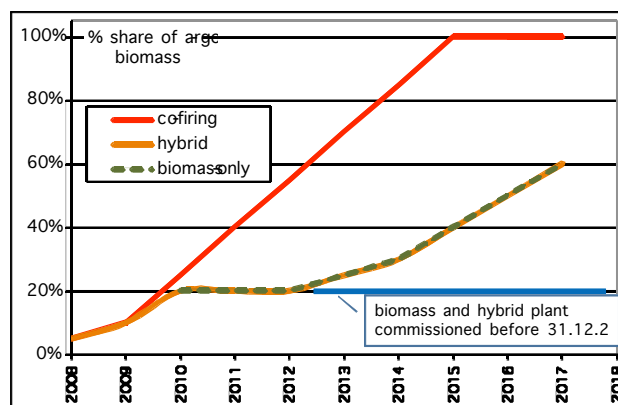
- Biomass is used in old power plants (efficiency about 33%) and big CHP plants in co-firing with coal
- Relatively low investment brings paid-back quickly thanks to green certificate
- Even high-quality, expensive wood and wood-fuel assortments are used
- Required increase of agriculture-origin biomass share is meant to curb co-firing



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Agriculture biomass

Necessity to use agriculture biomass in bigger plants (>20 MWe) – better conditions for smaller plants



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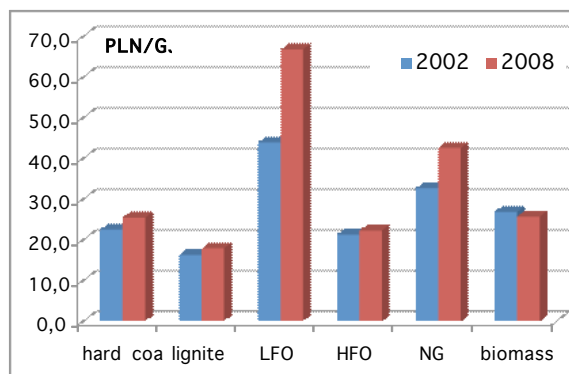
Local DH systems

- ❑ Majority of Polish towns have DH systems
- ❑ Small- and medium-size systems are supplied from HOBs, majority coal-fired
- ❑ Only few have CHP units (ORC, gas turbine)
- ❑ Even in regions of big biomass potential, **biomass is not used**



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Heat price by fuels



Coal is the cheapest fuel, even biomass cannot compete



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The solution - cogeneration

- Cogeneration from RES is supported by the system of certificates:
 - Green
 - Yellow/red (from 2010)
- Income from selling green electricity effectively is reducing heat price for end-users, even below heat from coal
- The Regulator (URE) shall not allow for increase of heat price after conversion from coal to RES



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Cogeneration in DH systems

- Today only some demonstration plants
- Necessary to develop and implement small and medium-size units:
 - Gasification of biomass + IC engine
 - Biogas +IC engine
 - Small ORC units
- The precondition: maximum electrical efficiency



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Gasification of biomass

- Different pilot projects reported, encouraging first news
- No proven „off-shelf“ technologies
- Shall be promising technology, with flexible input biomass supply
- Different IC engines could be used
- Electricity shall increase local power supply
- Heat to be used locally



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Biogas plants

- Expected fast increase of number of biogas plants
- Biogas plants shall be fitted to local biomass and heat demand conditions
- High-efficient cogeneration is demanded for combining of green and yellow certificates
- Biogas CHP units shall be well connected to local power and heat networks



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ORC units

- ❑ Only two plants in Poland in operation, limited by high investment costs
- ❑ Can be easily installed in existing coal HOB plants; especially in DH systems with experience in biomass co-firing
- ❑ Electrical efficiency of smaller units shall be increased
- ❑ For wider use investment costs shall be lower



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Small wind systems

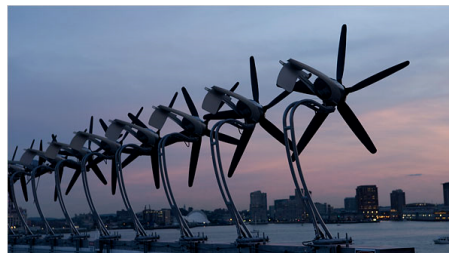
- ❑ Good wind conditions in Poland
- ❑ No legal barriers in implementing small wind turbines in large scale
- ❑ Preconditions:
 - Use of electricity to cover own needs (avoided purchase from the power grid)
 - Selling of green certificates
- ❑ Necessary conditions:
 - Intelligent metering
 - Legal entity



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Small wind systems (2)

- Limited number of wind turbines available, high prices
- Typically units with inverter offered
- Necessary development:
 - Small farms
 - Control systems
 - Inverters
 - Metering
 - Grid connection



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Swiss Contribution to Poland

- Infrastructure and environment
- Call for Projects Outlines in areas of EE and RES – many applications
- Attractive financing!
- Typical: combination of EE retrofits and RES (solar) – local support available
- Lack of ambitious, advanced projects in areas of RES, like cogeneration etc. – no technology available!
- New R&D programme – a chance!



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Conclusions

- ❑ Local energy systems require technological support in implementing of RES
- ❑ Potential for RES is big
- ❑ There no efficient RES technologies for local power and heat systems to be implemenented
- ❑ Swiss R&D and technological support shall be helpful



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