

**LITBIOMA scientific research  
as a basis for renewable energy  
sources development**

Bioenergy seminar,  
05 May 2009, Vilnius  
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# LITBIOMA today



- **Association is currently comprised of 30 members:**
  - **18 members in** Biofuel producers and suppliers section
  - **7 members in** Science and biomass resources section
  - **5 members in** Equipment for energy production section



# LITBIOMA mission and vision



## Our mission

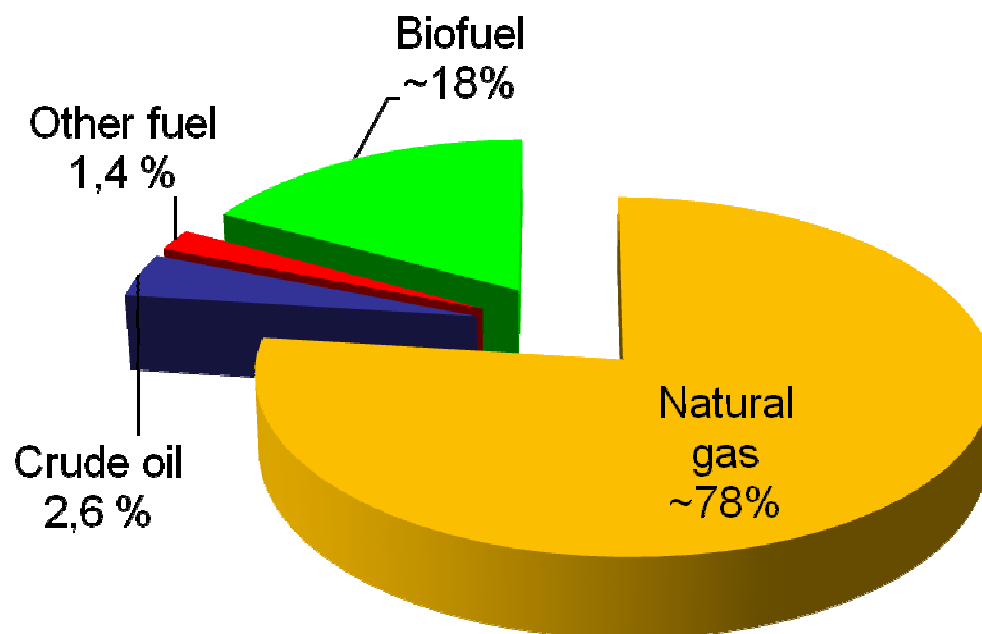
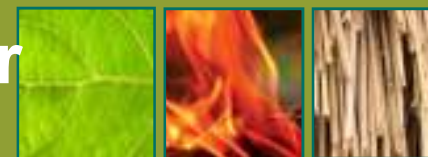
To promote wider utilization of renewable energy resources (first of all – biomass) in energy production, while following the principles of sustainability

## Our vision

Lithuania, as a country where the major part of the consumed energy is produced from renewable energy sources



# Current situation in district heating sector



# Arising questions



- What are the perspectives of biofuel use in Lithuania?
- Is Lithuania capable of achieving the goals set in the Directive on the promotion of the use of energy from renewable sources?



## LITBIOMA scientific research



- In December, 2008 LITBIOMA has finished a scientific research, which put foundation for Lithuanian action plan for promotion of use of RES from 2010 to 2020.
- Contribution of 10 most eminent Lithuanian scientists in different fields of renewable energy.
- According to the research, among other:
  - Lithuania has enough RES, which allow us not only to meet the formal requirements set for Lithuania in new RES Directive, but even to exceed them.
  - Biggest energy potential lies in biomass.



It is realistic to produce around 70 % of district heating using biomass until 2020.



## LITBIOMA scientific research (cont.)



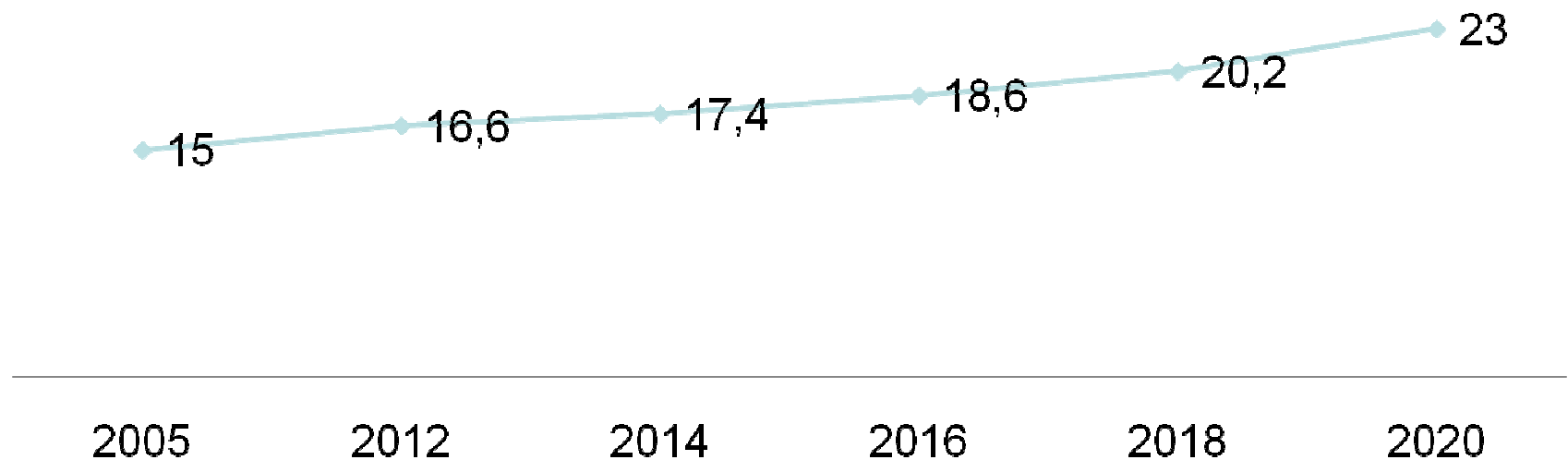
- As a result of LITBIOMA research:
  - Potential of renewable energy sources of Lithuania **analyzed**;
  - Obstacles for broader use of RES **identified**;
  - Necessary actions for improvement **suggested**;
  - Relation between RES potential and gross final energy production **preserved**.
  
- **RES directive goals are achievable**



# Lithuanian goals until Year 2020



RES energy share (%) in gross final consumption of energy  
as per RES Directive



# Forecast for gross final energy consumption



	<b>2008</b>	<b>2012</b>	<b>2014</b>	<b>2016</b>	<b>2018</b>	<b>2020</b>
Gross final energy consumption, total (ktoe)	5506	5974	6227	6477	6715	6956
Final energy from RES consumed (ktoe)	828	1092	1245	1416	1605	1825
<b>RES share (%)</b>	<b>15.0</b>	<b>18.3</b>	<b>20.0</b>	<b>21.9</b>	<b>23.9</b>	<b>26.2</b>

*e.g., DH from RES*

District heating from RES (ktoe)	150	229	273	317	373	444
<b>RES share in district heating (%)</b>	<b>18.1</b>	<b>28.6</b>	<b>35.9</b>	<b>45.0</b>	<b>56.5</b>	<b>70.0</b>

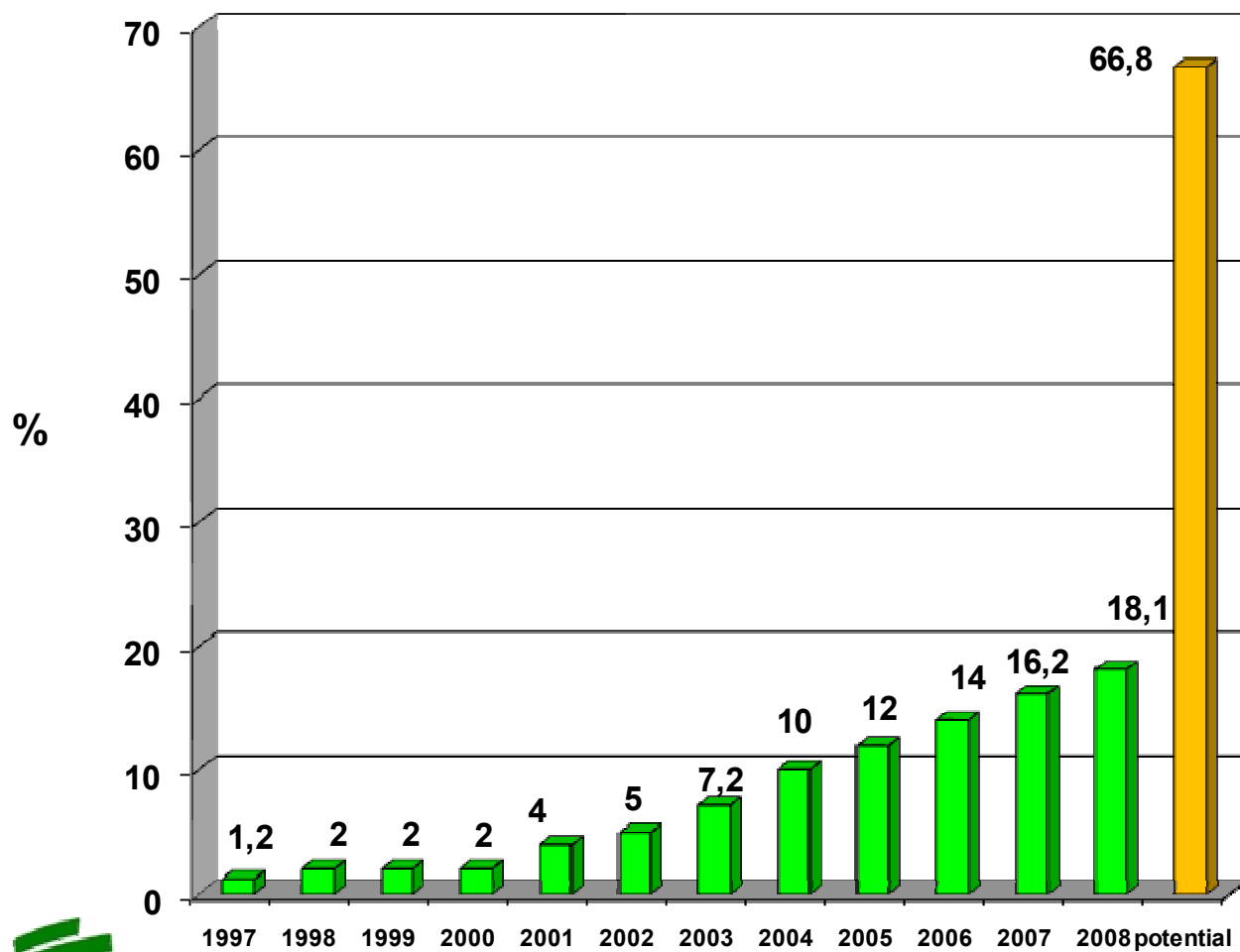




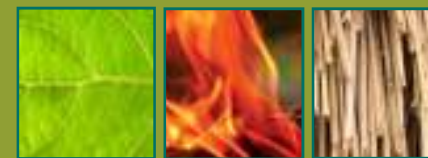
In order to illustrate the principle of LITBIOMA research, one Renewable Energy Source (**biomass**) in one sector (**district heating**) will be analyzed in this presentation



# Biomass share in district heating



# Realistic goals until Year 2020 in district heating sector



**~70 % district heating produced from biomass**

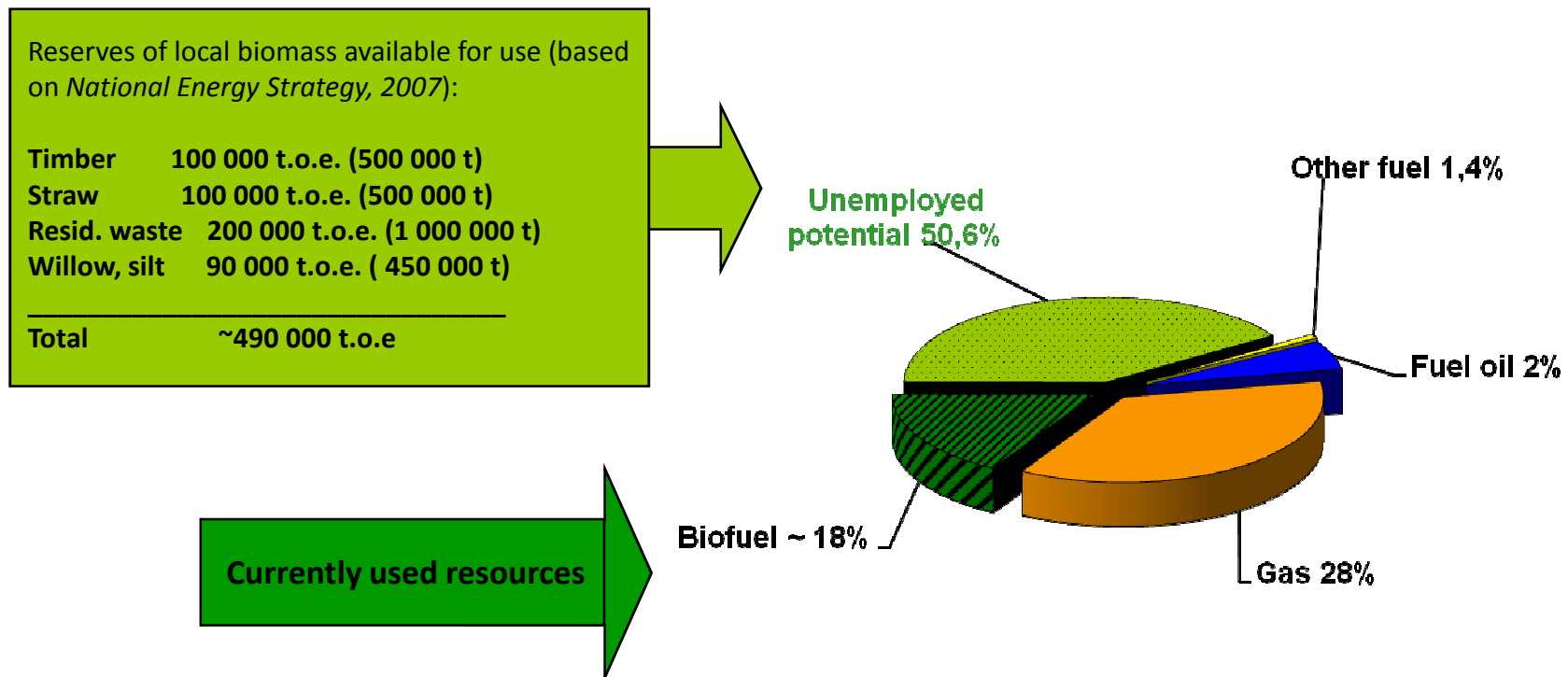
**~6% electricity produced from biomass (CHP's)**



# How was the goal created?



## Fuel Consumption Structure for District Heating Production in Lithuania having Evaluated Reserves of Biomass



# Theoretic (scientifically based) biomass potential



**Straw-** 2,4 million tones per year. Energetic potential- 850 ktoe.

**Municipal waste-** 1 million tones per year. Energetic potential- 200 ktoe.

Biomass from wood	Year 2020
	Firewood ( <i>thousand m<sup>3</sup> / ktoe/GWh</i> )
Wood industry residues ( <i>thousand m<sup>3</sup> / ktoe/GWh</i> )	1627/283/3291
Forest cutting residues ( <i>thousand m<sup>3</sup> / ktoe/GWh</i> )	1085/185/2152
<b>Total (<i>thousand m<sup>3</sup></i>)</b>	<b>5930</b>
<b>Total (<i>ktoe/GWh</i>)</b>	<b>1033/12014</b>
Energy plants plantations ( <i>ktoe</i> )	70
<b>Total (<i>ktoe/GWh</i>)</b>	<b>1103/12828</b>



# Sources for financing the renewable energy sector



## Tax on natural gas

- Necessity to introduce tax on natural gas used for heat and electricity production;
- The finances from the tax should be allocated to national fund for promotion of RES;
- Sponsorship, financing and support for RES projects should come from national RES promotion fund.



## Actions for heating sector (Financial) (1)



- Governmental support for mobilization of biomass:
  - forest logging residues mobilization
- Governmental support to the conversion of fossil fuelled boilers, heat plants and CHP's to biofuel boilers
  - Partial reimbursement of direct investments
- Subsidy for buyers of wood pellet boilers (e.g. 50%)



## Actions for heating sector (Financial) (2)



- Governmental support for production of bio-electricity in CHP's (feed-in tariffs);
- Economically feasible support for short rotation plant plantations;  
*(current reimbursement of 40% cost for planting plantations is not rational and does not stimulate the market. It should be increased to 70 %)*
- Support for implementation of new technologies of straw burning.



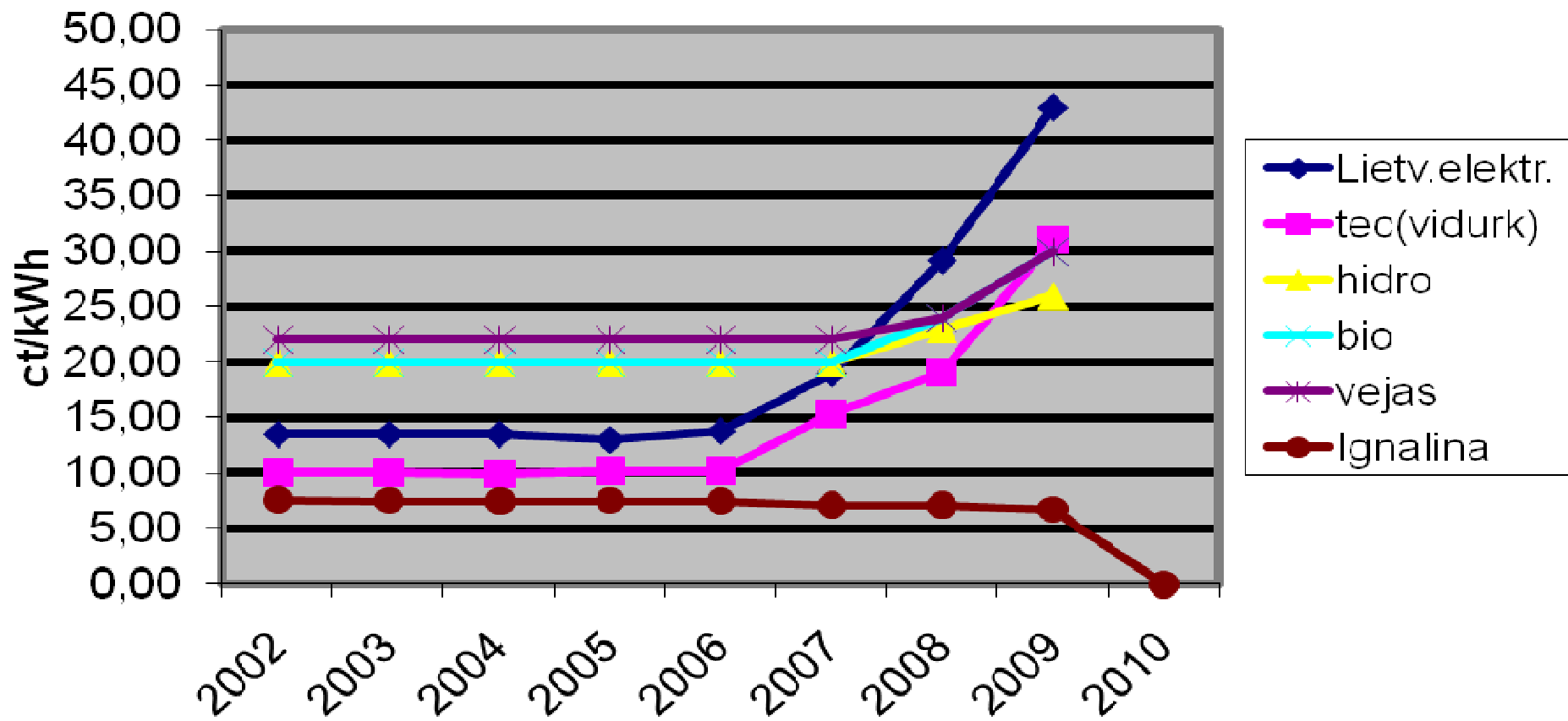
## Actions for heating sector (Legal)



- Limitation of total 700 MW installed capacity of biomass boilers has to be removed;
- Use of municipal waste for energy production should be legally obligatory;
- Change the forest cutting rules and improve wood cutting residue availability for biomass.



# Factual electricity prices (to the grid)



# LITBIOMA vision on support for “green” electricity



Price of green electricity

=

Basic electricity price,  
corresponding to public  
interests

+

Bonuses for green energy

The price can not be lower  
than for electricity from  
fossil fuels





# Theoretic potential of different RES in Lithuania



# Wind



Factual use and maximal potential until Year 2020 (*economic feasibility of the potential is not taken into account*)

wind	2007	2020
Installed capacity	54 MW	1'000 MW
Electricity production	106'100 MWh (9'123 toe)	2'854'800 MWh (24'5468,6 toe)



# Hydro energy



Factual use and potential until Year 2020

Hydro energy	2007	2020
Installed capacity	28 MW (small scale) 101 MW (Kaunas hydro plant)	55 MW (small scale) 301 MW (large scale)
Electricity production	96'000 MWh (small scale) 350'000 MWh (Kaunas hydro plant)	160'000 MWh (small scale) 1'050'000 MWh (large scale)



# Geothermal energy



Factual use and potential until Year 2020

<b>Geothermal</b>	<b>2007</b>	<b>2020</b>
Installed capacity	District heating - 13,5 MW Shallow geothermal – 20 MW	District heating - 80 MW Shallow geothermal – 45 MW
Energy production	District heating– 1'500 toe Shallow geothermal–6'000 toe	District heating – 8'900 toe Shallow geothermal–14'000 toe



# Biogas



Factual use and potential until Year 2020

Biogas	2007	2020
Installed capacity	2,90 MW electricity 7,8 MW heat	40 MW electricity and 50 MW heat in CHP's; 10 MW heat in boilers
Energy production	2'500 toe	60'000 toe



# Biofuel



Fact and theoretic potential until year 2020 (*economic feasibility of the potential is not taken into account*)

Biofuel	2007	2020
Production capacity	244'000 t	980'000 t
Biofuel production	12'217 toe (bioethanol) 42'574 toe (biodiesel)	877'085 toe*

\* figure according to National Energy Strategy- 450'000 toe until year 2025





**Thank you!**

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