



Lithuanian District Heating Association

Lithuanian district heating: present situation and barriers for developing

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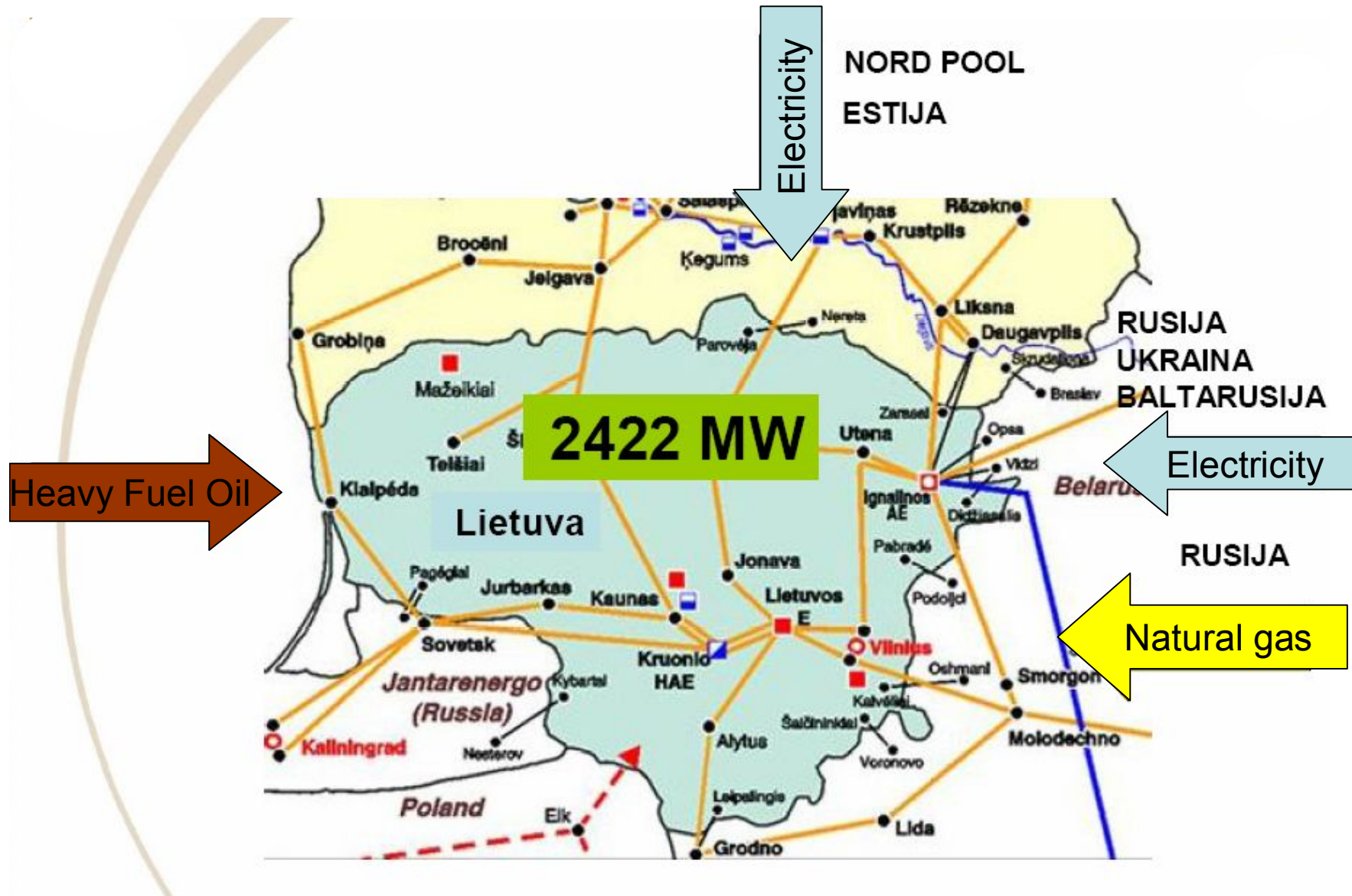
Present Situation in Lithuania



Population: 3,6 mill.
Area: 65 300 km²

Present Situation in Lithuania

Primary and secondary energy import/export

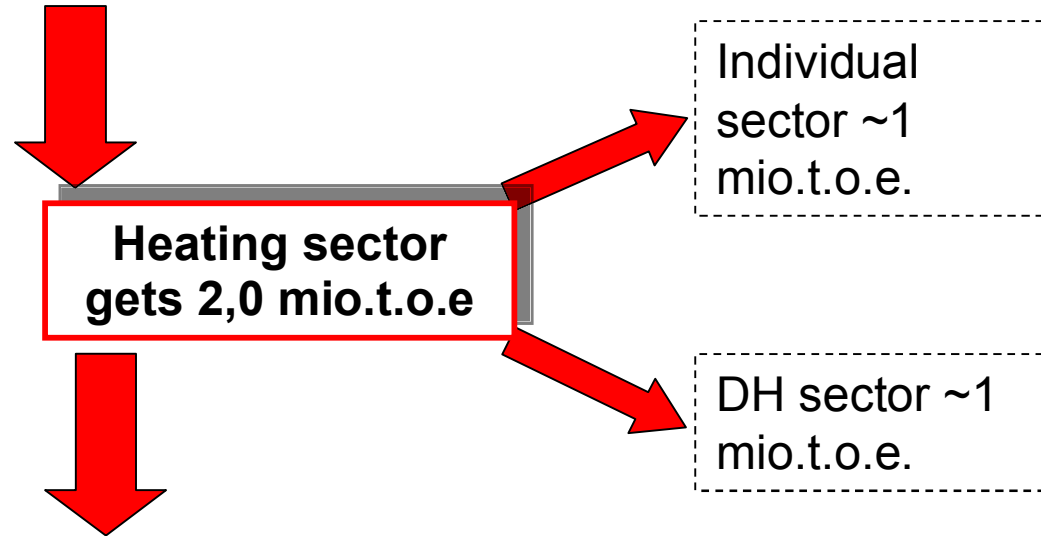


Present Situation in Lithuania

| |
|--|
| Primary energy supply |
| Coal (0,261 mio. t.o.e) |
| Biofuel (0,766 mio. t.o.e) |
| Hidro (0,035 mio. t.o.e) |
| Nuclear (2,255 mio. t.o.e) |
| Chemical process (0,174 mio. t.o.e) |
| Oil (2,655 mio. t.o.e) |
| Natural gas (2,455 mio. t.o.e) |

The consumption of primary energy in Lithuania

Primary energies (in total) = 8,6 mio.t.o.e



This accounts for 23% of total quantity of primary energy

Present Situation in Lithuania

Key indicators of the Lithuanian DH sector

| Group according to the heat production | Subgroup according to the heat production | Quantity in items | Produced heat GWh a year | Power Installed MW | Power achieved MW | The part used of installed power, % |
|--|---|-------------------|---|--------------------|-------------------|-------------------------------------|
| 5 GWh and more | >150 | 10 | 7292 | 7743 | 3048 | 39 |
| | ≥90 – to 150 | 2 | 253 | 205 | 69 | 34 |
| | ≥50 – to 90 | 8 | 601 | 620 | 208 | 34 |
| | ≥25 – to 50 | 19 | 687 | 712 | 182 | 26 |
| | ≥5 – to 25 | 48 | 588 | 510 | 176 | 35 |
| Total: | ≥5 | 94 | 10300 | 8600 | 3683 | 38 |
| To 5 GWh | < 5 | 263 | 272 | 371 | No information | |
| | Total: | 357 | 10572,5 GWh heat through 2006 year | 8971 | | |

Present Situation in Lithuania

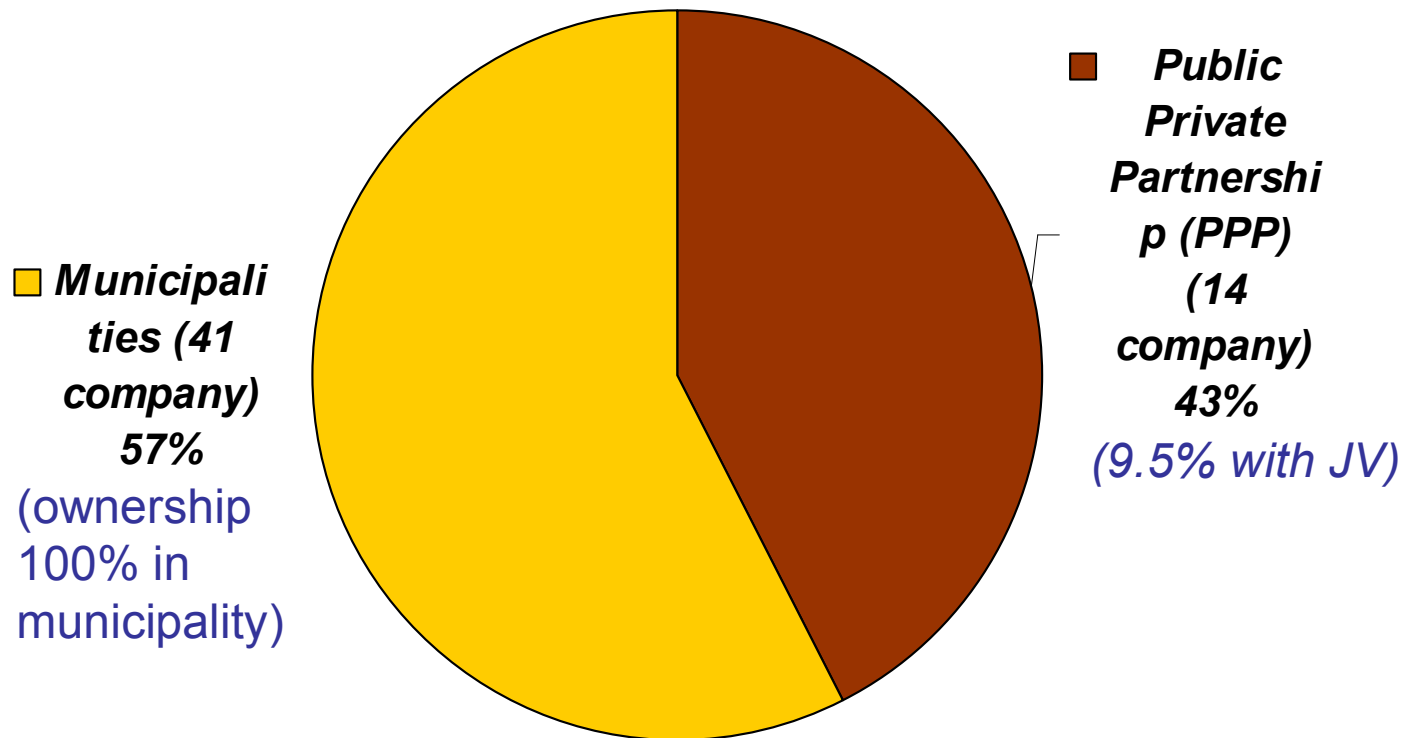
Key indicators of the Lithuanian DH sector

| | 2006 | 2007 | 2008 I half |
|---|---------------------|---------------------|----------------------------|
| Heat delivered to the network (<i>thous. MWh</i>) | 10393 | 9669,6 | - |
| Heat delivered to consumers (<i>thous. MWh</i>) | 8545 | 7957,6 | - |
| Average cost of fuel (<i>€/t.o.e</i>) | 174,4 | 234,6 | ~376,5 |
| Comparative fuel input (<i>kg.o.e./MWh</i>) | 98,3 | 98,7 | - |
| Average heat price (<i>€/MWh</i>) | 34,7 | 40,0 | 43,4 |
| | (cost price - 35,0) | (cost price - 43,4) | (cost price - 60,0) |
| Profit (<i>mio. €</i>) | -7,5 | -31,9 | ~(-36,5) |
| Fuel input for heat production (<i>t.n.e</i>) | 1 024 607 | 944 266 | - |
| Share of biofuel in total fuel structure (%) | 14,0 | 16,2 | - |
| Number of heat consumers | 609 292 | 621 173 | - |

Present Situation in Lithuania

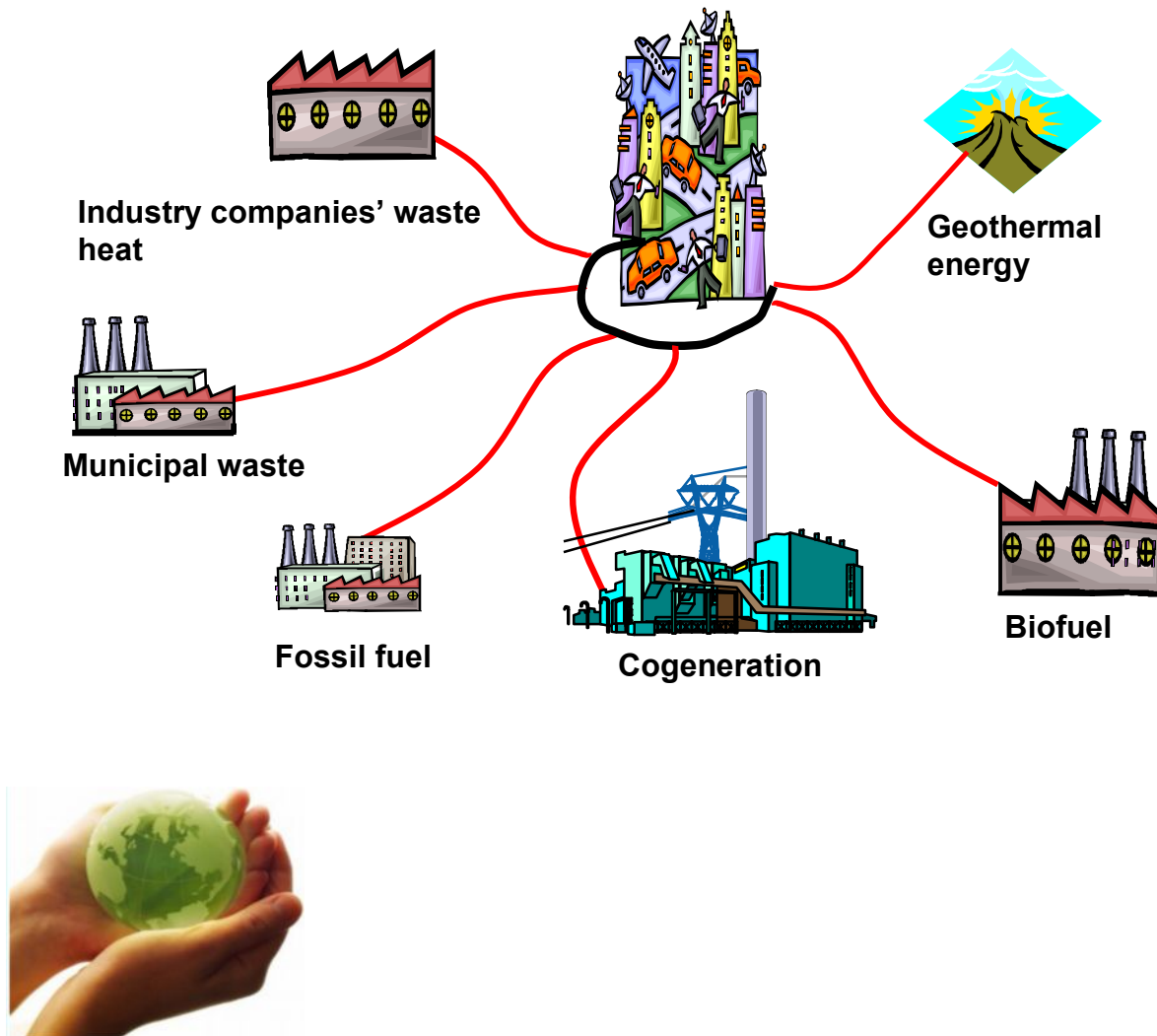
DH Ownership structure, 2007

The lease of heat utilities to foreign and domestic investors started in 2000. Private capital has entered in the DH sector offering high investments for modernization and stable prices



Present Situation in Lithuania

Achievements of DH companies improving DH sector



I. Projects implemented in heating sector 1996-2007 m.

1. DH transmission loss

2. Comparative fuel input for DH production 1996-2007

3. The increase in use of renewable energy resources for heat production

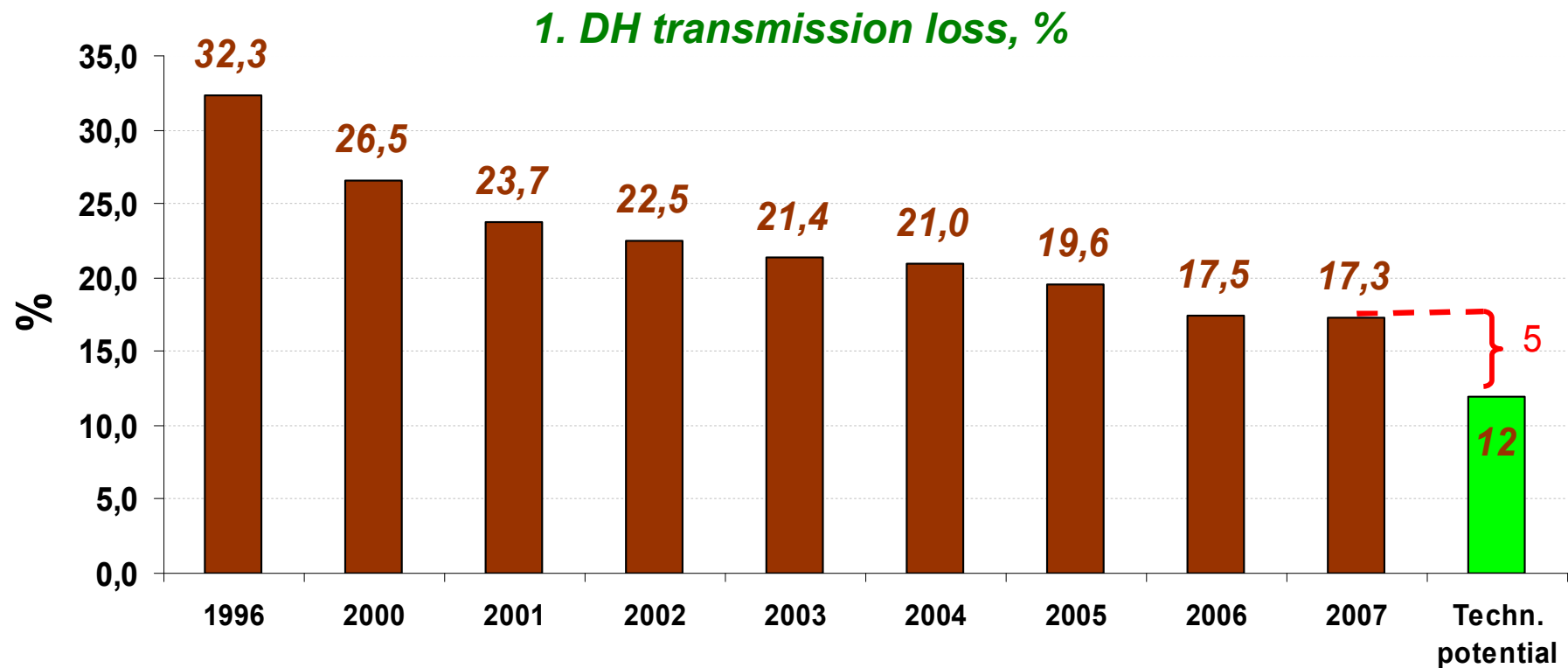
4. Reduction in quantity of pollution

5. The increase of heat consumers

6. Total investment from 1996 to 2007

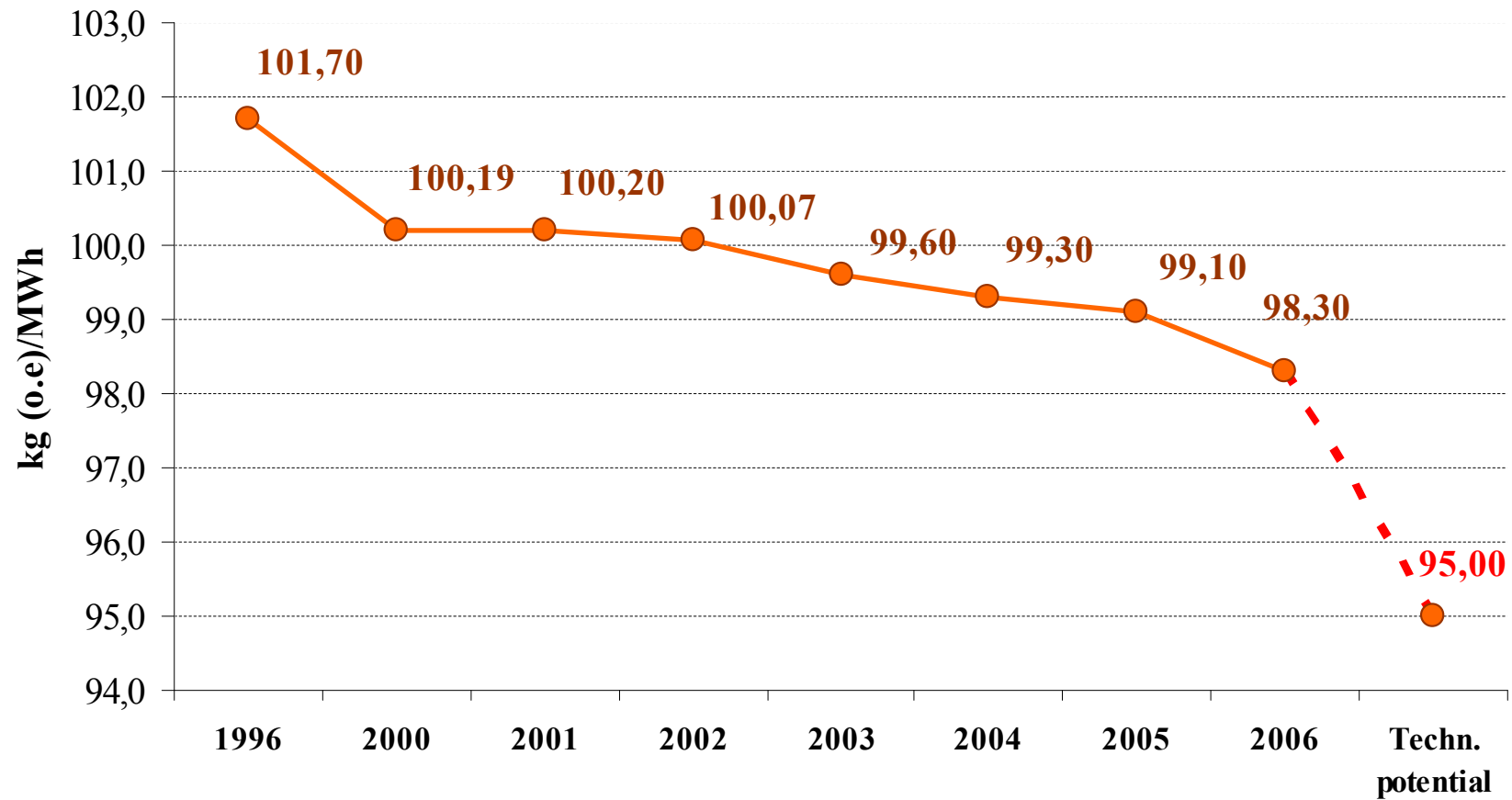
Present Situation in Lithuania

After implementation of new projects and technologies the efficiency and image of heating sector increased in society



Present Situation in Lithuania

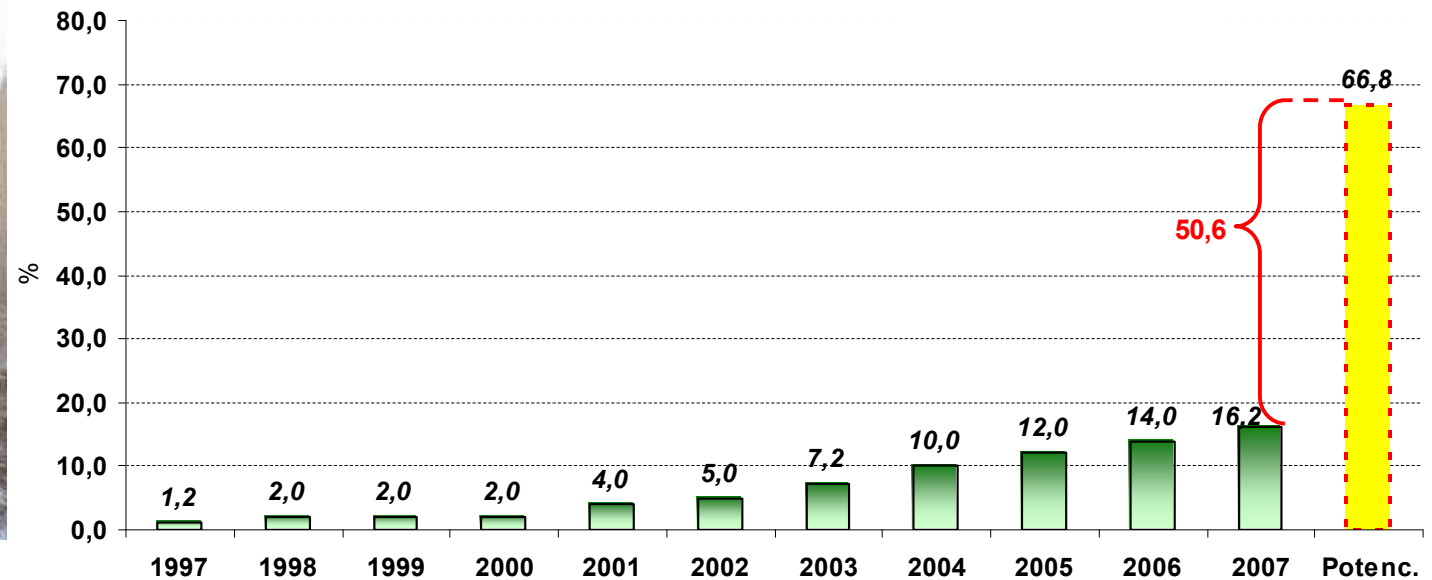
2. Comparative fuel input for DH production 1996-2007



Present Situation in Lithuania

3. The share of renewable energy resources (biofuel) in general fuel structure

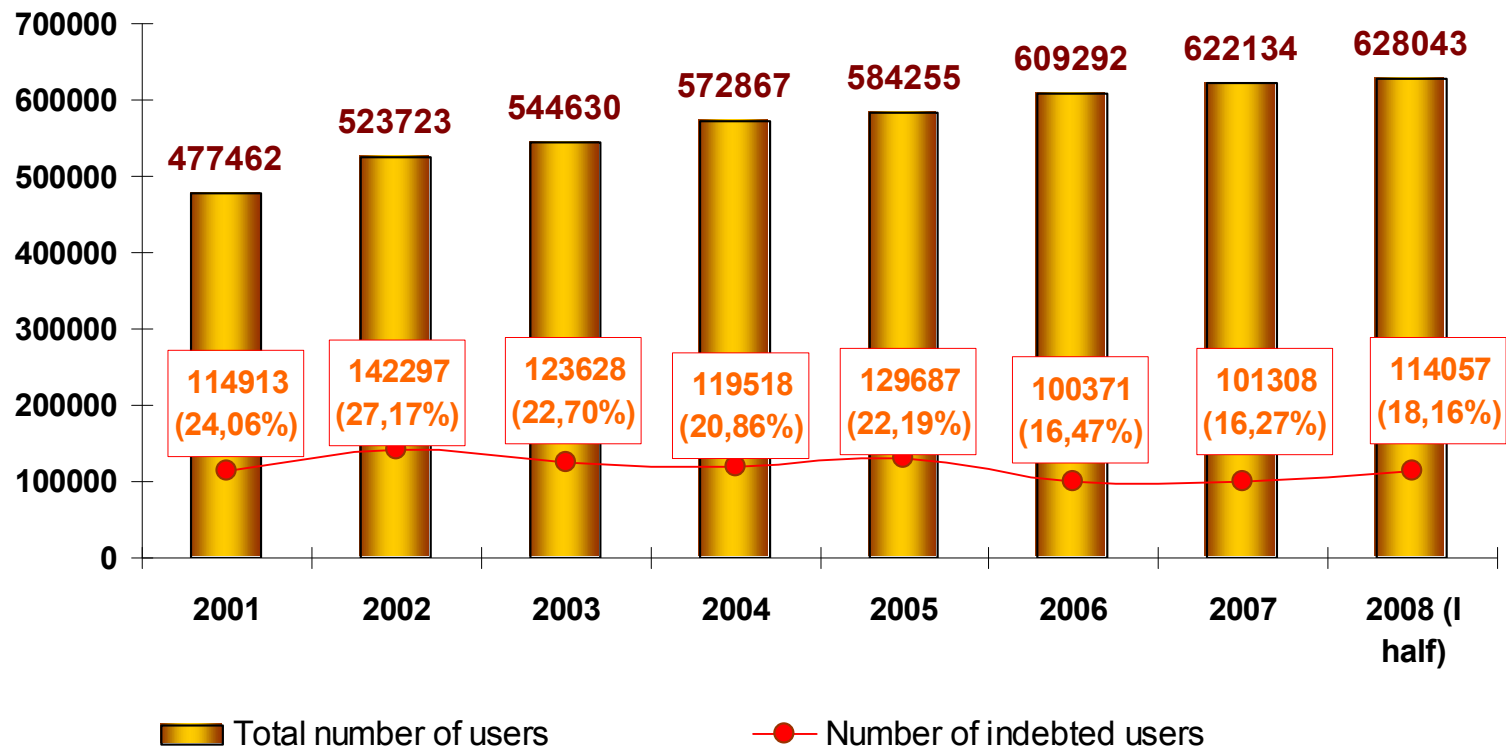
Biofuel boiler houses:
~200 pcs
(~ 416 MW capacity)



Present Situation in Lithuania

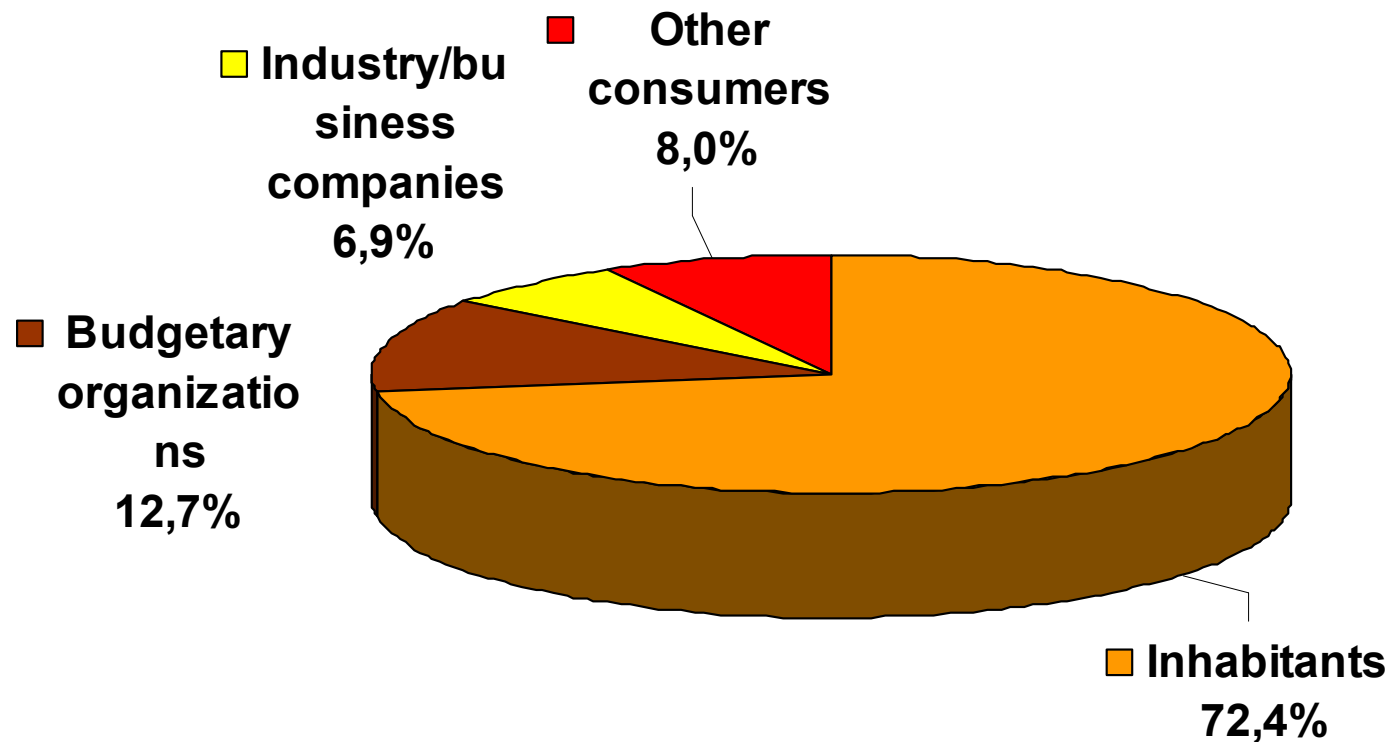
5. The increase of heat consumers

The average debt level is about 18% in 2008 (I half)



Present Situation in Lithuania

5.1. Heat energy consumers, 2007



Present Situation in Lithuania

6. Total investment from 1996 to 2007

- Investments for DH modernisation are increased annually:
 - 2007 over 89 mio. EUR
 - 2006 over 61 mio. EUR
 - 2005 over 53 mio. LTL.
- About 1 billion LTL (290 mio. EUR) for DH sector modernisations was invested during 1996 - 2007



National Strategies, Programmes

1. National Energy Strategy (2007)
2. Implementation Plan of National Energy Strategy 2008-2012 (2008)
3. National Energy Efficiency Programme 2006-2010 (2006)
4. Energy Efficiency Action Plan (2007)
5. Housing Strategy (2004)
6. Support Programme on Renovation of Multy-family Apartment Houses (2004, 2008)
7. National Strategy on Sustainable Development (2003)
8. Guidelines of District Heat Sector Development (2008)
9. Programme for the promotion of biofuel production and use (2004)
10. State Strategy Plan on Waste Disposal (2007)

UPDATED NATIONAL ENERGY STRATEGY (2007):

key strategic provisions of DH sector development

- 1) to manage Heat sector according to Municipal Heat Plans
- 2) to construct 400 MW capacity CHP plants in Klaipėda, Panevėžys, Šiauliai, Alytus, Marijampolė and other cities by 2020 (investments up to 2 billion LTL)
- 3) to use municipal waste for heat and power production, where it is economically and ecologically feasible. In that case:
 - to construct municipal waste combustion plant in Vilnius by 2010 (annual capacity - 200 000 tones of domestic waste)
 - to construct similar plants in Kaunas, Klaipėda, Šiauliai and Panevėžys by 2025
- 4) to modernize DH supply systems by 2015:
 - to install secure reserve networks;
 - to reconstruct up to 75% of existing DH pipelines (for this purpose apply support from EU Structural funds (investments up to 1.4 billion LTL)
- 5) to create favourable economic and legal conditions for buildings renovation
- 6) to promote the involvement of private capital in district heating modernization projects by means of ESCO models or other PPP schemes

Developmental trends of heating economy in Lithuania until 2025

Implementation Plan of National Energy Strategy for 2008-2012

/Extracts: The main projects of DH sector/

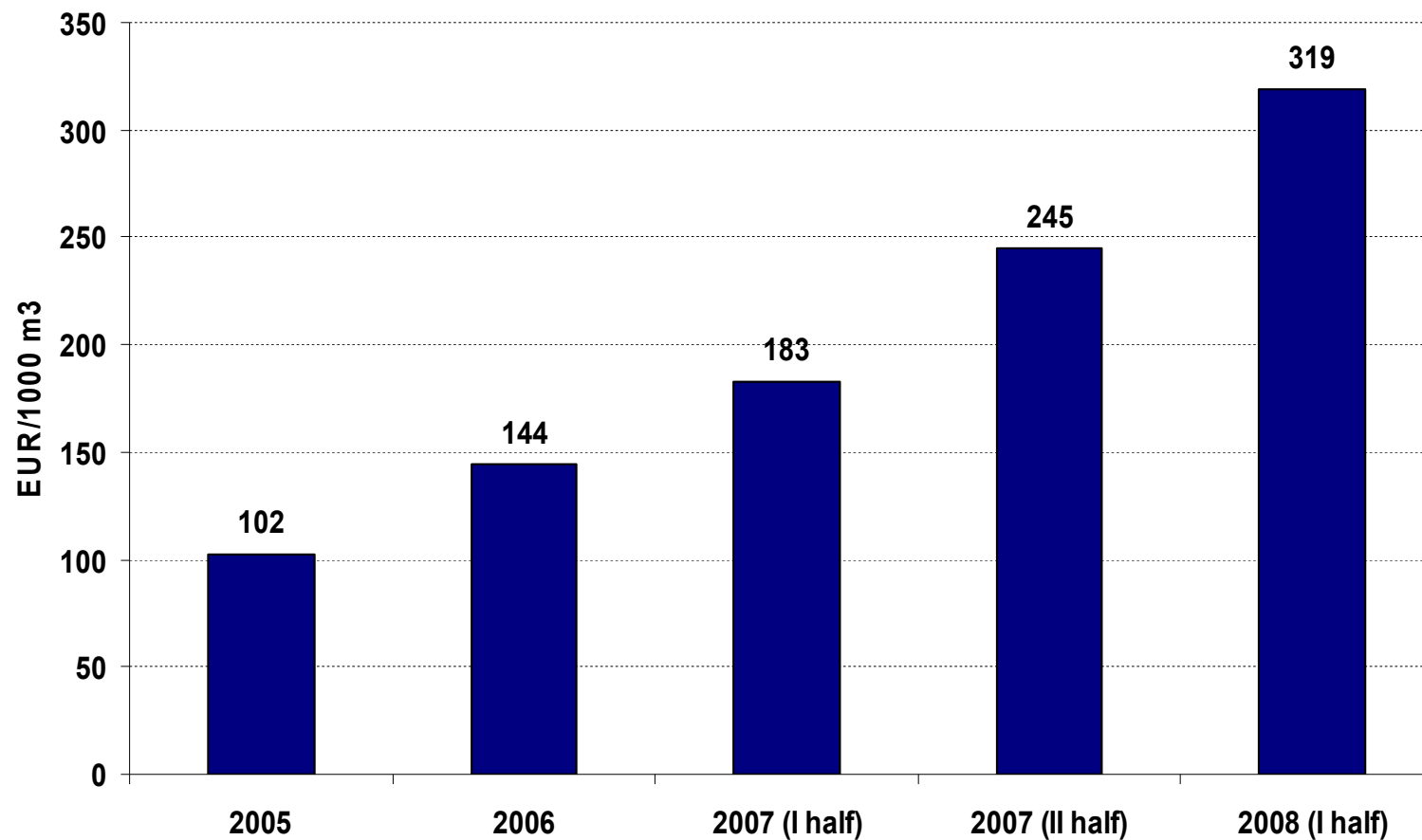
| No. | Measure | Company responsible for implementation | Duration | | Preliminary demand of funds, thous. EUR | | | | | Total, thous. EUR |
|------|--|--|----------|--------|---|-------|-------|-------|-------|-------------------|
| | | | Start | Finish | 2008 | 2009 | 2010 | 2011 | 2012 | |
| | | | | | | | | | | |
| 1.6. | Construction of biofuel CHP plant in Šiauliai (capacity: 9 MW _e and 20 MW _h) | AB „Šiaulių energija“ | 2008 | 2009 | 4866 | 12599 | | | | 17465 |
| 1.7. | Construction of biofuel CHP plant in Utena (capacity: 2 MWe and 8,5 MWh) | UAB Utenos šilumos tinklai | 2008 | 2009 | 2896 | 2896 | | | | 5792 |
| 1.8. | Construction of new CHP plants (total power capacity 100 MW) in other cities with developed DH systems | DH companies | 2008 | 2012 | 14481 | 43443 | 43443 | 28962 | 14481 | 144810 |
| 1.10 | Construction of municipal waste, biofuel CHP plant in Klaipėda (capacity: 25 MWe and 50 MWh) | AB „Klaipėdos energija“ | 2008 | 2011 | 348 | 34754 | 36550 | 88276 | | 159928 |
| 1.11 | Construction of municipal waste CHP plant in Vilnius (capacity: 20 MWe and 50 MWh) | UAB „Regioninė komunalinių atliekų deginimo gamykla“ | 2008 | 2011 | 5792 | 49235 | 23170 | 80233 | | 158430 |
| 1.12 | Construction of municipal waste CHP plant in Kaunas (capacity: 15 MWe and 50 MWh) | AB „Kauno energija“ | 2008 | 2011 | 348 | 34754 | 36550 | 70725 | | 142377 |
| 5.3. | Installation of air pollution cleaning technologies in new constructed Vilnius, Kaunas and Klaipėda municipal waste CHP plants | UAB Regioninė komunalinių atliekų deginimo gamykla, AB „Klaipėdos energija“, AB „Kauno energija“ | 2009 | 2011 | | 28962 | 2896 | 28962 | 2896 | 63716 |
| 5.4. | Implementation of pollution cleaning and control (monitoring) technologies in Vilnius, Kaunas and Mažeikiai power plants | UAB „Vilniaus energija“, UAB Kauno termofikacijos elektrinė, AB „Mažeikių nafta“ | 2008 | 2012 | 5792 | 11585 | 5792 | 46339 | 43443 | 112951 |
| 6.1. | Reconstruction of existing and building of new heat production facilities for biofuel utilization | DH companies and municipalities | 2008 | 2012 | 15929 | 15929 | 8689 | 9557 | 9557 | 59661 |

Out of 98 measures of all energy sectors 40 are DH measures

Obstacles hindering to implement the trends of heating economy in Lithuania

(1/8)

Natural gas price including transportation and capacity fee



Obstacles hindering to implement the trends of heating economy in Lithuania

(2/8)

Recalculation of DH price is not related to increase of fossil fuel price, thus DH companies are brought to loss

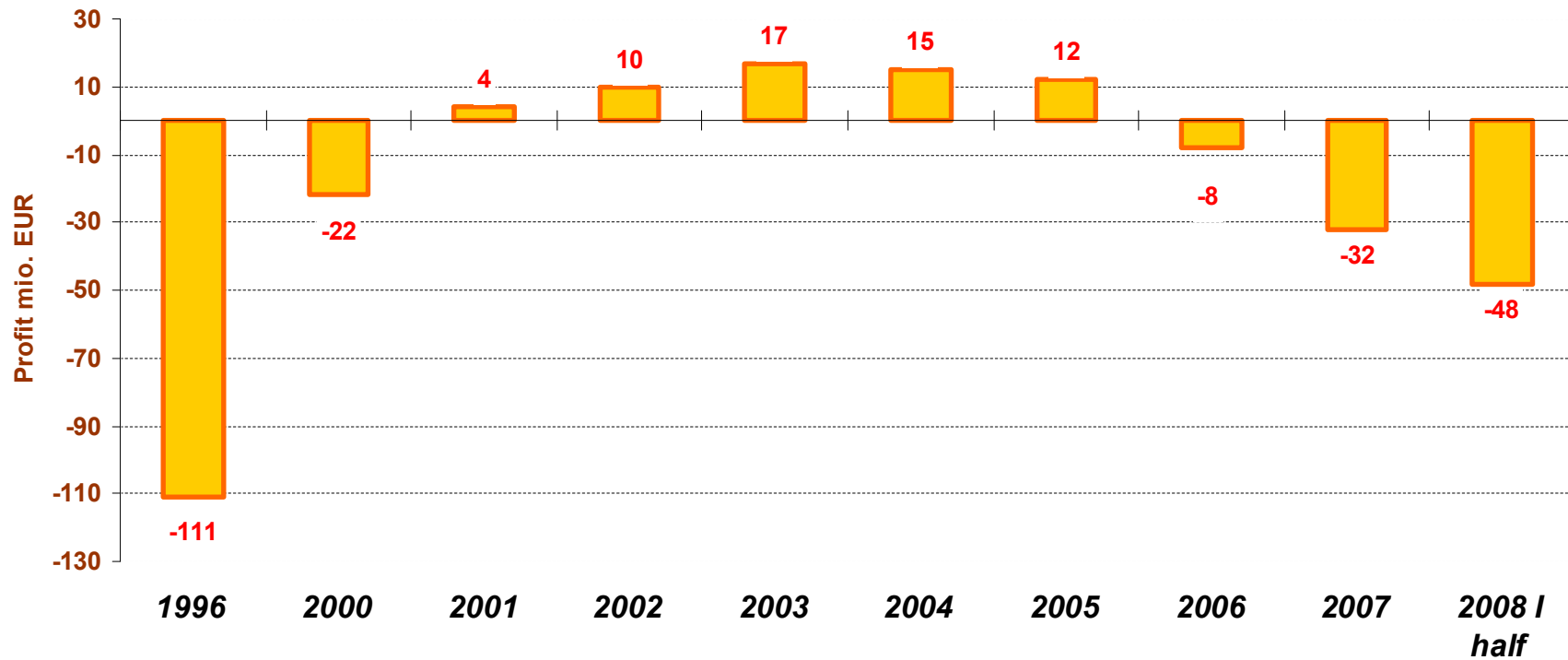
Evaluation of DH cost-price

| | | 2005 | 2006 | 2007 | 2008 |
|---|---------------------|--------|--------------|--------------|--------------|
| | | | | | I half-year |
| Natural gas price including transportation and capacity fee | EUR/thous.m3 | 101,6 | 143,6 | 213,6 | 318,6 |
| | EUR/t.o.e | 127 | 180 | 267 | |
| Comperative fuel consumption for heat | kg oe/MWh | 99,10 | 98,30 | 98,30 | 98,30 |
| Share of fuel in DH cost-price structure | EUR/MWh | 12,313 | 16,742 | 25,620 | |
| Fixed and variable cost in DH cost-price structure | EUR/MWh | 18,76 | 18,54 | 18,54 | |
| DH cost-price | EUR/MWh | 31,08 | 35,28 | 43,44 | 59,95 |
| Avarage DH price for consumers | EUR/MWh (excl. VAT) | 32,6 | 34,7 | 40,0 | 43,44 |
| Loss/Profit for heat sell | mio. EUR | 12,2 | -7,7 | -31,9 | -48,1 |

DH companies have suffered **87,8 mio EUR losses** during 2006, 2007 and I half-year of 2008

Obstacles hindering to implement the trends of heating economy in Lithuania

Profit/Loss of DH companies



Obstacles hindering to implement the trends of heating economy in Lithuania

(4/8)

Because of bureaucracy, state and municipal institutions do not issue permissions for the construction of cogeneration power plants burning municipal waste. Such power plants would generate electricity and heat for consumers;

5/8

There is a risk that the EU financial support for 2007-2013 will not be fully employed or misused. As 2 years have passed, however, estimated instructions concerning EU structural support as regards the implementation of modernizing means in heating sector have still not been confirmed;

(6/8)

Multiflats are renovated too slowly

- According to the data provided by the Ministry of Environment there are 700 partially renovated apartment houses. It makes **only 2 %** of all 45000 apartment houses, where reside the majority of Lithuanian population.
- There are 20-30 totally renovated (complex renovation) houses



Obstacles hindering to implement the trends of heating economy in Lithuania

(7/8)

Uncoordinated pricing principles between the country's energy sectors

| | Power sector | Natural gas sector | Heat sector |
|---------------------------------|---|---|---|
| Estimated property | Recalculated + new created | Non recalculated + new created | Neither recalculated + nor new created |
| Calculation of normative profit | From reappraised property excluding supply margin | From unreappraised property + supply margin | From unreappraised property excluding supply margin |
| Real costs | Established with no restrictions | Established with no restrictions | Established with set of restrictions |

The reappraised differ from unrepressed by 3 times

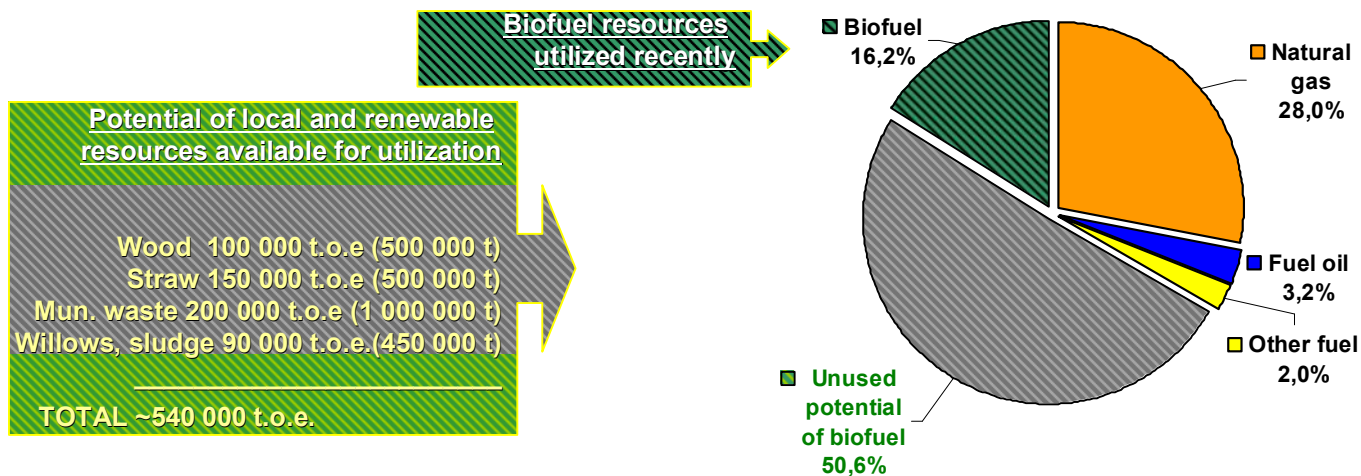
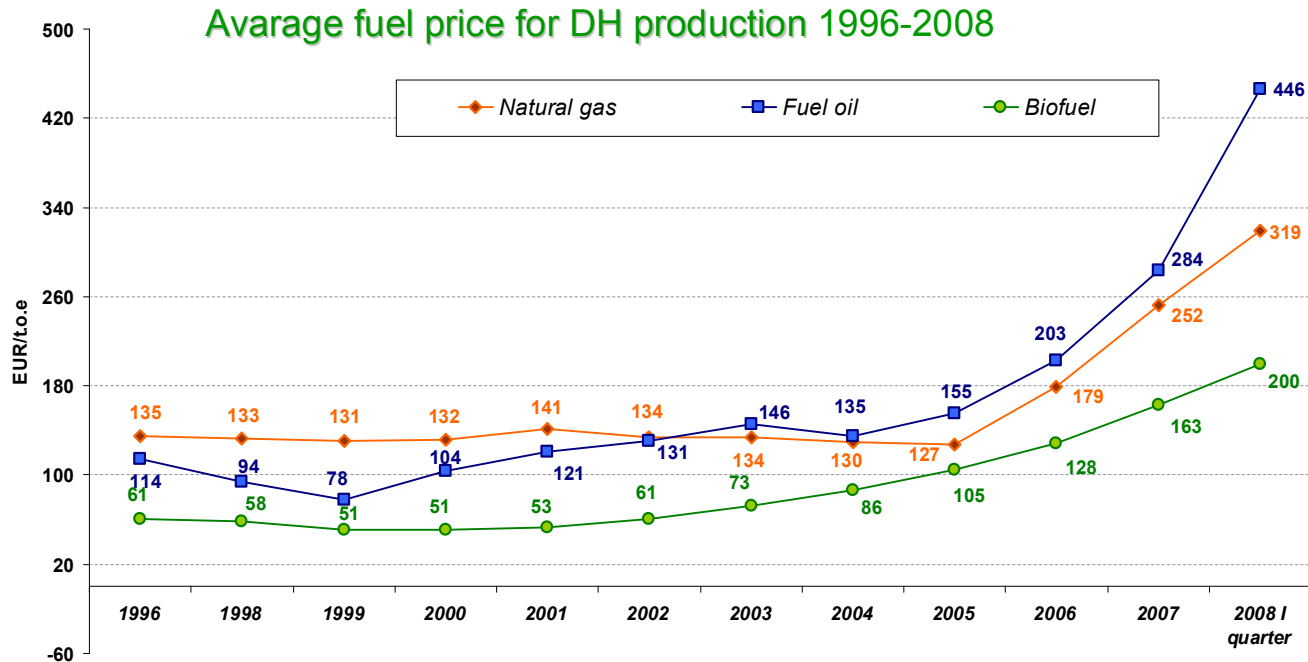
The main part of costs is not established as indispensable costs in DH sector

LDHA proposals how to find the way out of the existing situation

- 1. The use of biofuel for the production of heat;***
- 2. The use of municipal waste for the production of heat;***
- 3. Accelerating the renovation of buildings which waste heat;***
- 4. The expansion of cogeneration power plants;***

LDHA proposals how to find the way out of the existing situation

1. The use of biofuel for the production of heat

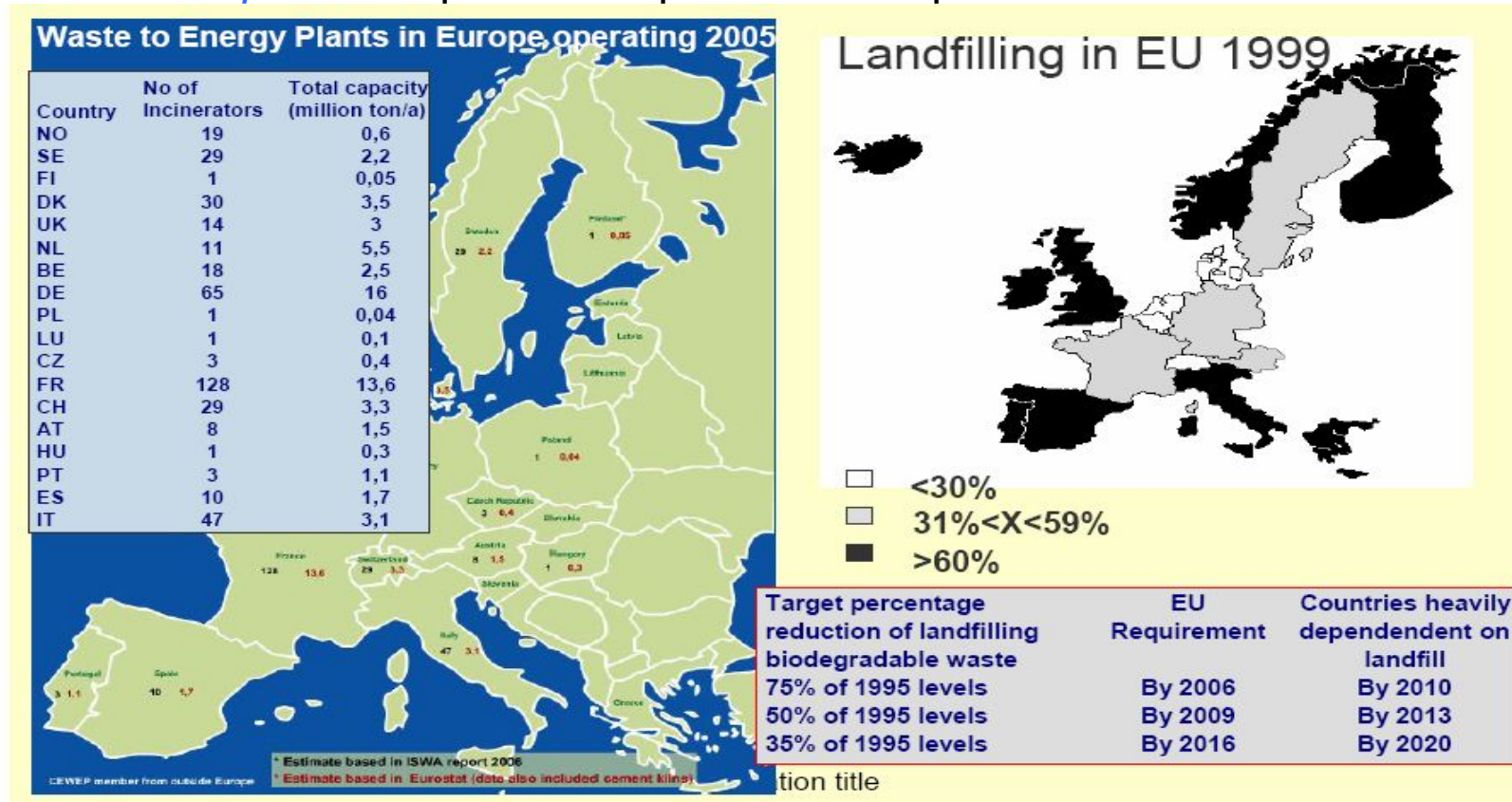


LDHA proposals how to find the way out of the juncture

2. The use of municipal waste for the production of heat

There are 418 municipal waste plants in Europe, where about 58,5 mio. tones of waste incinerated annually for heat and power production.

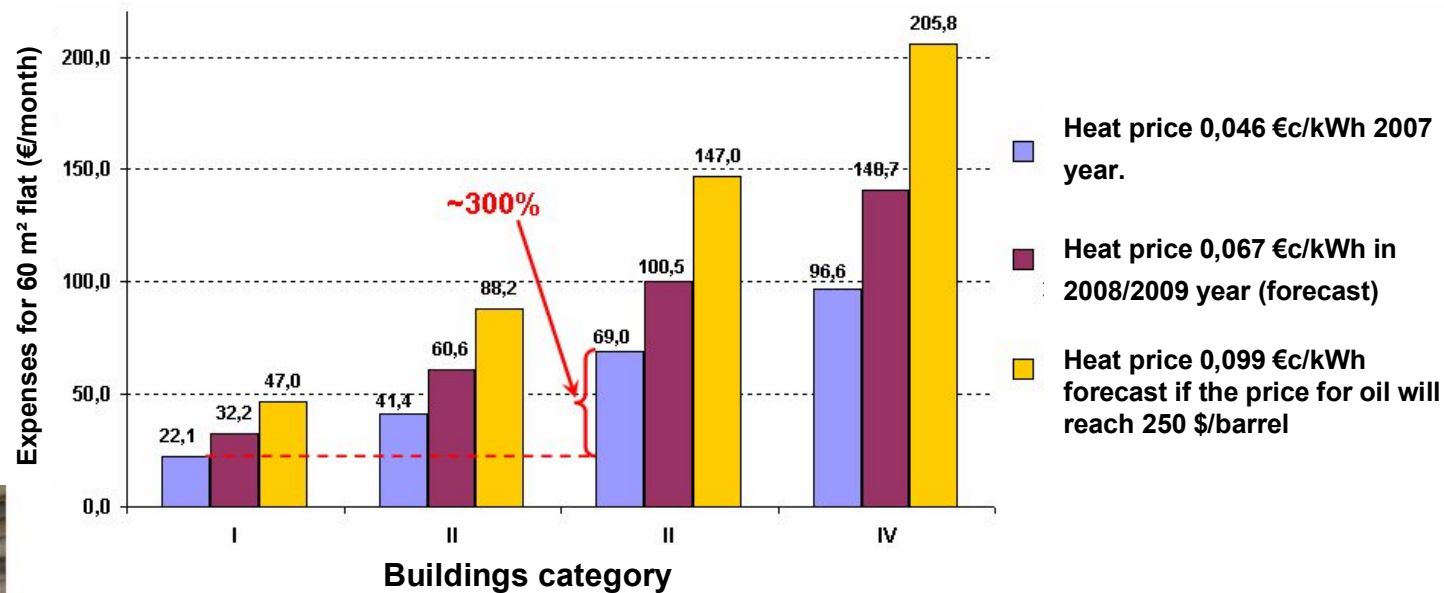
In Lithuania there are about 1.3 mio tones of municipal waste which could be incinerated by making about 30 % of total DH production. Currently *these waste are buried in dumps* and expensive imported fuel is purchased.



LDHA proposals how to find the way out of the existing situation

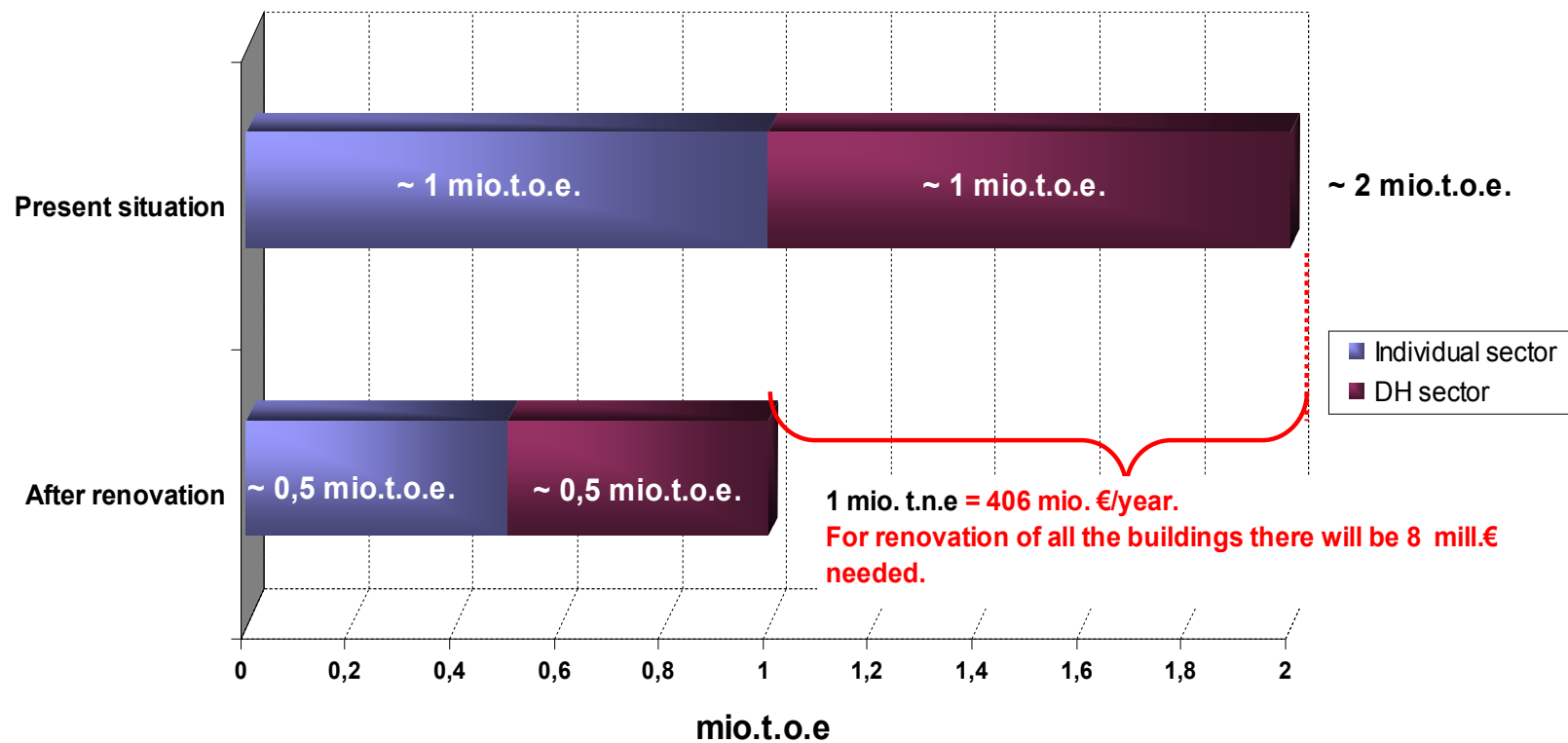
| | |
|--|---|
| <p>I. Apartment houses with low heat consumption (modern, high construction quality or reconstructed buildings,)</p> |  |
| <p>II. Apartment houses with low or average heat consumption (modern, with proper heat insulation buildings)</p> |  |
| <p>III. Apartment houses with high heat consumption (old, unrenovated buildings)</p> |  |
| <p>IV. Apartment houses with very high heat consumption (old, poor heat insulation buildings)</p> |  |

Payment analysis in 2007/2008 heating session and forecast for 2009 year in Lithuania



LDHA proposals how to find the way out of the existing situation

The need of fossil fuel (mio.t.n.e./year) for district heating in Lithuania (2007/2008)



LDHA proposals how to find the way out of the existing situation

LDHA proposals:

1. To prepare a survey where would be made an analysis of DH sectors developments in East European countries during the last 15 years period; to compare the received data with results of West European countries.
2. To prepare the EU Directive on regulation of DH sector activity (as it is for electricity and gas sectors)

Informative and educational activity

- Informacijos viešinimas interneto svetainėje www.lsta.lt (puslapis atnaujintas 2007 m. pabaigoje).

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LIETUVOS ŠILUMOS TIEKĖJŲ ASOCIACIJA

Centralizuotai tiekama šiluma – švari aplinka

 Lietuviškai

Website updated 2008-09-03
Now online 5
Total 189012
(since 2008)



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News

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[The National Heat Energy Technology Platform has been established](#)

2006-02-07

[Emissions trading – a new market with new market mechanisms](#)

2005-10-13

[Cooperation agreement for promotion of biofuel](#)

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Events

2007-09-14

[EFIEES International Forum "Energy demand-side management: which actions to improve Energy Efficiency in buildings?"](#)

2006-03-01

[Seminar on NETWORKING in the frame of energy saving organisations of the partnering countries/regions](#)

2005-12-13

[SENET/ESCOBALT Conference](#)

2005-11-22

[CENERG Conference „Policy and Strategy of Sustainable Energy Development for Central and Eastern European Countries until 2030“](#)

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DISTRICT HEATING - CITY WITHOUT CHIMNEYS



Vilnius, district heating



The city of England, individual heating