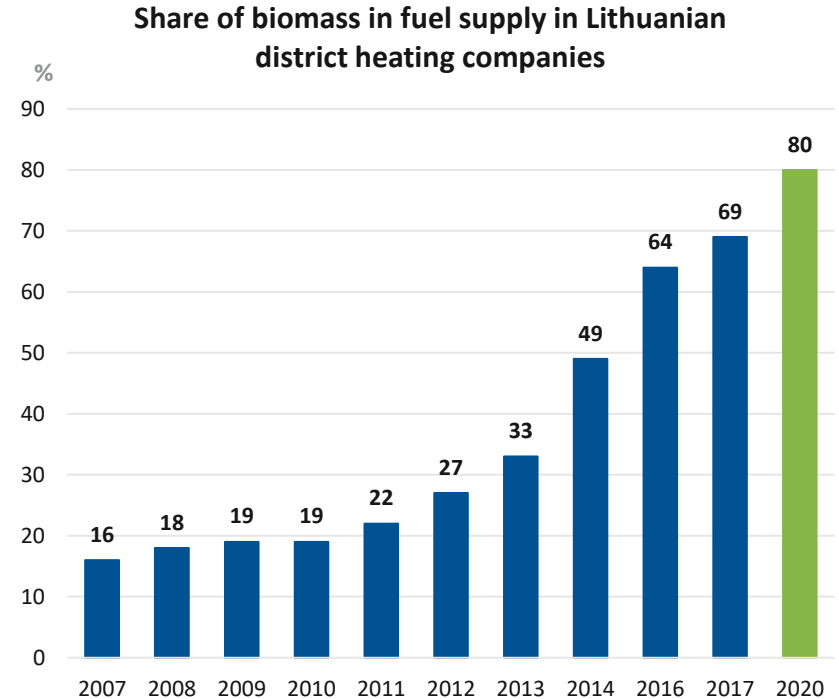
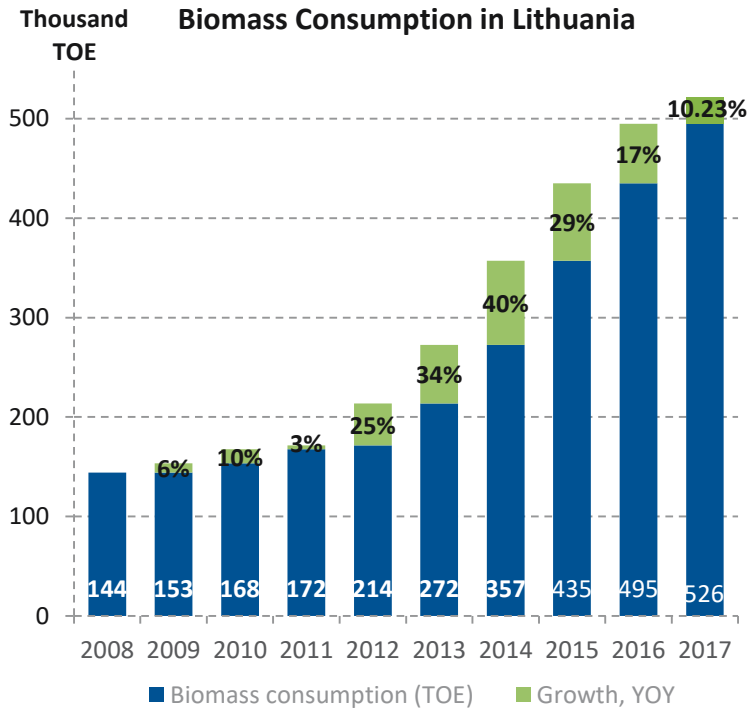


BIOMASS TRADED AS COMMODITY:

BALTPOOL EXPERIENCE

Vaidotas Jonutis
Head of trading

NATURAL GAS CONVERSION TO BIOMASS IN CHP SECTOR



Data: Association of Central Heating Companies of Lithuania

Biomass has become a strategic energy resource in the Lithuanian energy sector

MARKET PROBLEMS IN 2012

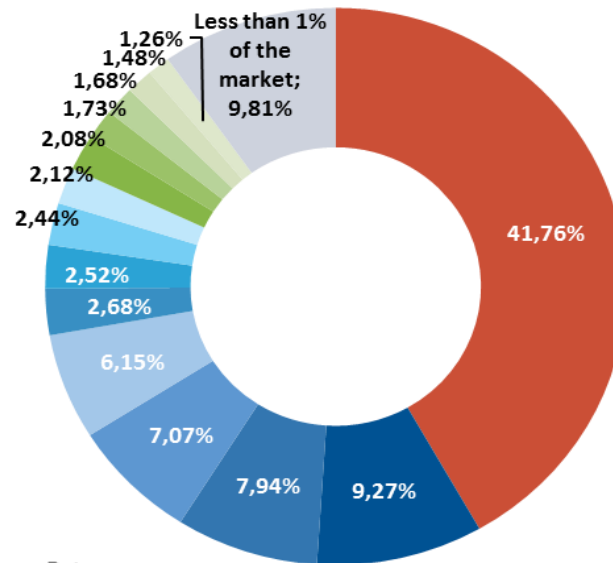
- By 2012, purchases of biomass, natural gas and oil in Lithuania in the CHP sector were carried out according to the same rules
- The biomass and natural gas sectors had become indistinguishable for consumers

Criteria	Biomass	Natural gas
Number of suppliers	Market dependent on a limited number of suppliers	Only Gazprom
Competition	Oligopoly	Monopoly
Profit margins	Superprofit	Superprofit
Market barriers	Impossible to conclude a contract with buyers	Only one trading hub
Contract duration	Long term (Most longer than 3 years)	Long term (over 5 years)

The market was unable to regulate itself. Result for consumers - high fuel prices = high heat prices

BIOMASS MARKET CONCENTRATION IN 2012

High concentration in biomass supply side in Lithuania (2012-2013)



Data:
National Control Commission For Prices And Energy
2012-2013 heating season biomass suppliers' market share
according delivered biomass quantities to regulated CHP's

Market situation before the Exchange: non-transparent purchase practice; high barriers for new market participants; weak competition between suppliers; high market concentration.

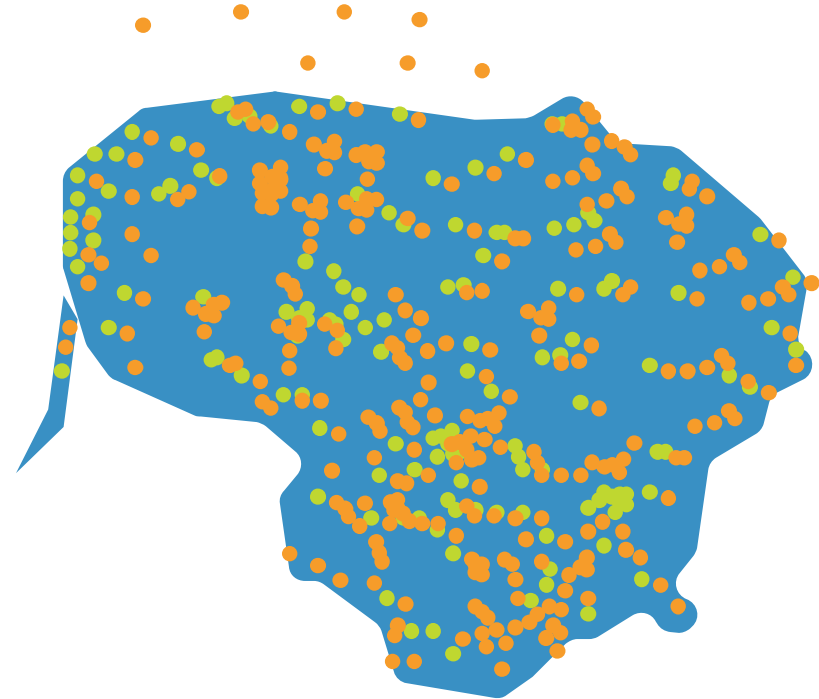
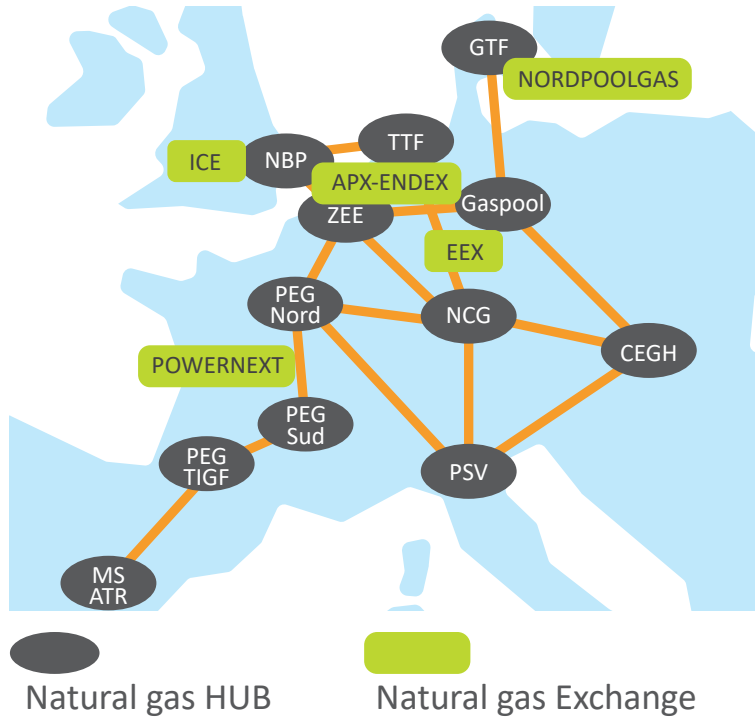
TAILORED SOLUTIONS

Market competition rules are

Biomass market – established biomass exchange
The main target to increase transparency and competition in the biomass market

Additional value – cost saving, time saving, standardization, good business environment

MAIN CHALLENGE TO CREATING A BIOMASS EXCHANGE



- 12 NG trading hubs in Europe
- TSO and existing grid
- Supply guaranteed by TSO
- Regulated transmission tariff

- Unlimited trading hubs
- Virtual transmission system
- Supply guarantees market liquidity
- Different tariffs for every supplier

BIOMASS DISPLAYS ALL THE FEATURES OF AN ORDINARY COMMODITY



Product has many users and suppliers

Brand doesn't matter much or there is no brand

Product and processes can be standardized

Little differentiation between a tradable commodity coming from one producer and the same commodity coming from another source

Product must be usable upon delivery

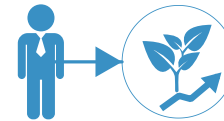
HOW THE EXCHANGE CHANGED THE MARKET



Standardized biomass products and biomass supply procedures;



Equal and transparent trading rules for all participants;



Low market barriers for new market participants;



Market liquidity ensures reliable systemic risk management;



Effective price establishment mechanism – open auction.

ALL EXCHANGE PARTICIPANTS ARE COORDINATED ON ONE PLATFORM

Statistics for 2018:

Executed transactions	> 5,000
Submitted orders	Bids > 17,000, offers > 68,000
Participants	71 buyers, 130 sellers
Max suppliers to one buyer	51 suppliers/year
Delivered trucks of biomass	~ 66,000, >400 trucks/day
Quality arrangement and written invoices	> 11,000

Baltpool has become the central biomass business organising platform

BALTPOOL CREATES SPOT MARKET

BALTPOOL WOOD CHIPS SPOT LITHUANIA index



DEVELOPED AND LIQUID BIOMASS EXCHANGE CREATES ADDITIONAL VALUE FOR THE ENTIRE MARKET

- Electronic trading decreases administration costs
- Reduced marketing costs
- Decreased risk premiums and brokers' margins
- Security of supply ensured without price increase
- Increased trade transparency and important information sharing
- Decreased costs and barriers to new participants to enter biomass market
- Opportunities created to develop financial instruments (e.g. derivatives)
- Derivatives increase liquidity, providing price hedging possibilities
- New opportunities for standardization of other related services e.g. reserves of biomass trading.

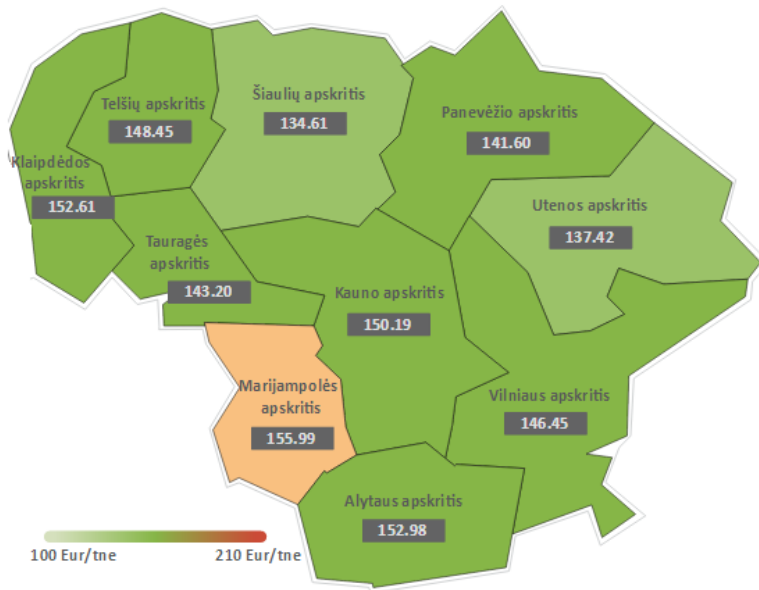
Liquid Biomass exchange ensures market transparency, efficiency and competitiveness

RESULTS OF BIOMASS TRADED AS A COMMODITY IN LITHUANIA

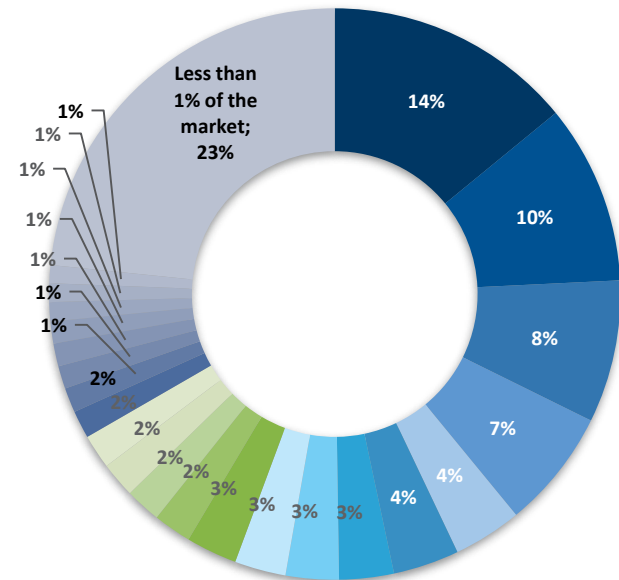


CHANGES RESULTED IN A MORE COMPETITIVE BIOMASS MARKET WITH LOWER BIOMASS PRICES

Biomass price differences decreased
(2016-2017 heating season)



Low concentration in biomass supply in Biomass Exchange (Y2016)

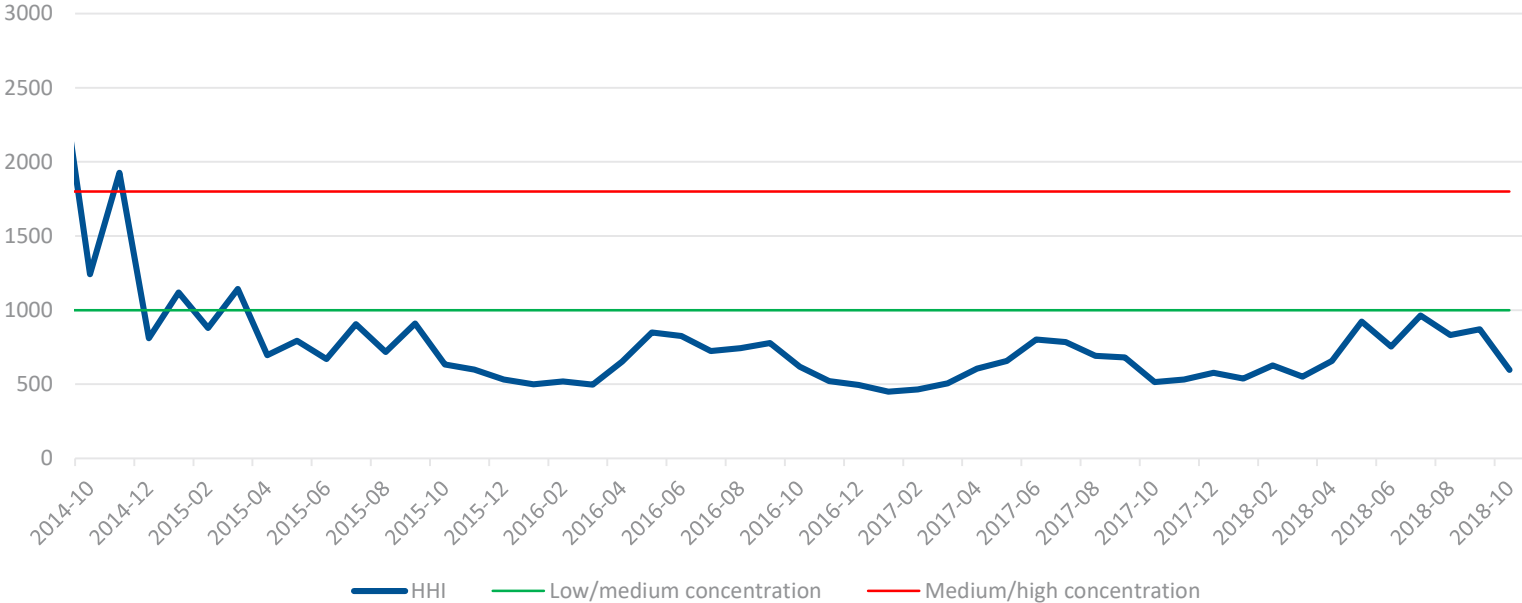


Data:
Energy Exchange Baltpool UAB
Biomass suppliers' market share in Biomass Exchange according delivered biomass quantities (Y2016)

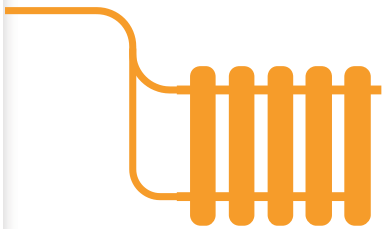
The Biomass Exchange increased market transparency and efficiency in Lithuania: biomass prices decreased by up to 40% (depending on region) compared to 2012, and price differences between neighboring municipalities almost disappeared. The Exchange also solved the biomass supply concentration problem.

COMPETITION INDEX INDICATES RIGHTS DECISIONS

Herfindahl–Hirschman Index
2015 – 2018 m.



REDUCED HEAT PRICES IN LITHUANIA

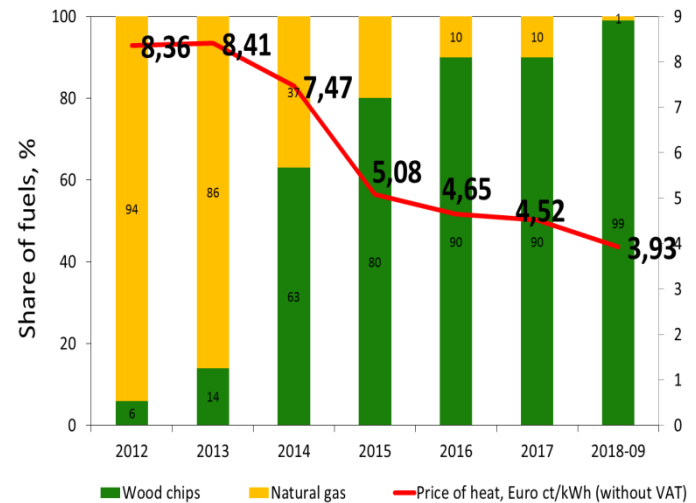


The price of heat in Lithuania reduced (over 5 years)



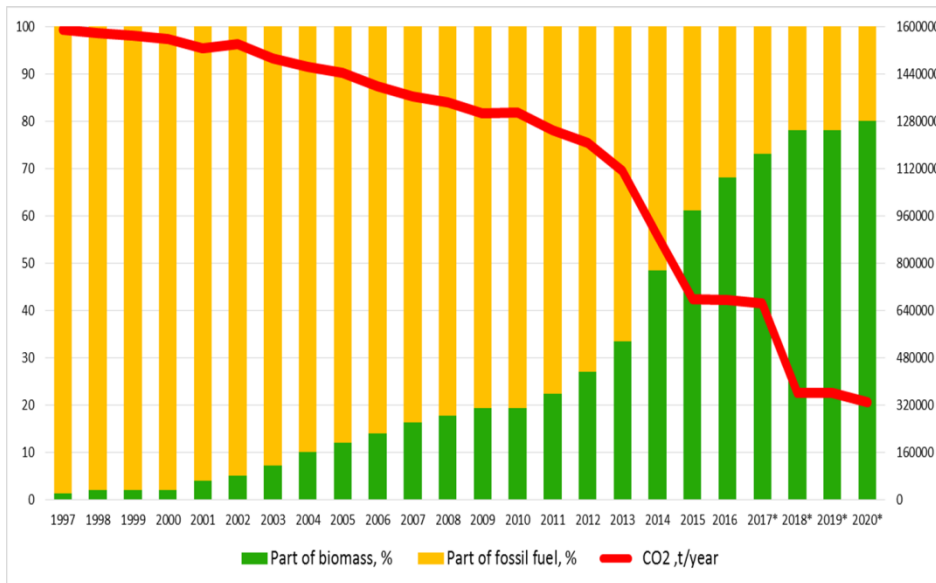
-25 %

KAUNAS CITY SUCCESS **-50 %**



Changes result from the percentage share of Biomass used

GREENHOUSE GAS (CO₂) EMISSIONS IN DH

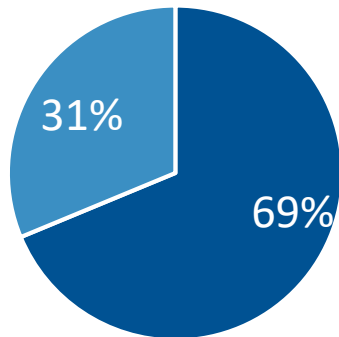


Since 1997 CO₂ emissions reduced in DH

↓
-60 %

RESULTS OF HEATING SECTOR EVOLUTION

Heat producers distribution in 2018



- Licensed heat producers
- Independent heat suppliers

- Gas – 17%, renewables – 69%;
- Biomass price 2.5 times lower than gas price, 90% acquired in biomass exchange;
- Average heat price – 10% less compare to 2008 (taking into account inflation and 610 million Euros of new investments into the sector);
- 20% more customers compared to 2008.

INTERNATIONAL DEVELOPMENT AND FUTURE PLANS



Thank You
For Your Attention

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