Lithuanian DH at a crossroad: which way to choose?

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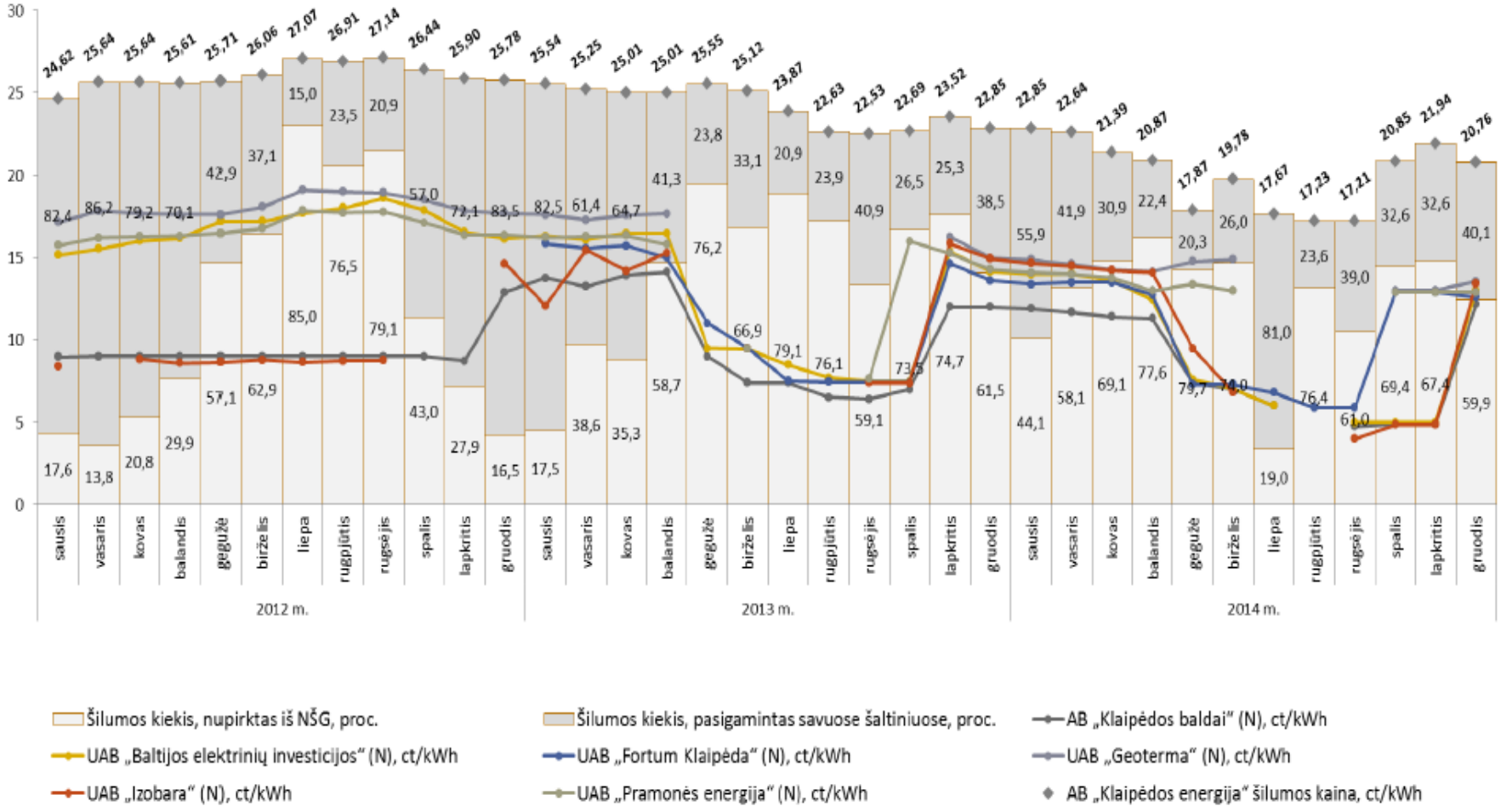
District heating market development in large Lithuanian cities

- District heating market was organised as vertically integrated monopolies serving captive consumers
- Lithuanian district heating market has been (and still is) under very deep regulation
- Lack of investments into new efficient heat production capacity and transmission pipelines
- The increase of natural gas prices stimulated investment to biofuel boilers
- Independent heat producers (IHP) were allowed. Competition in heat generation has began.

What happened?

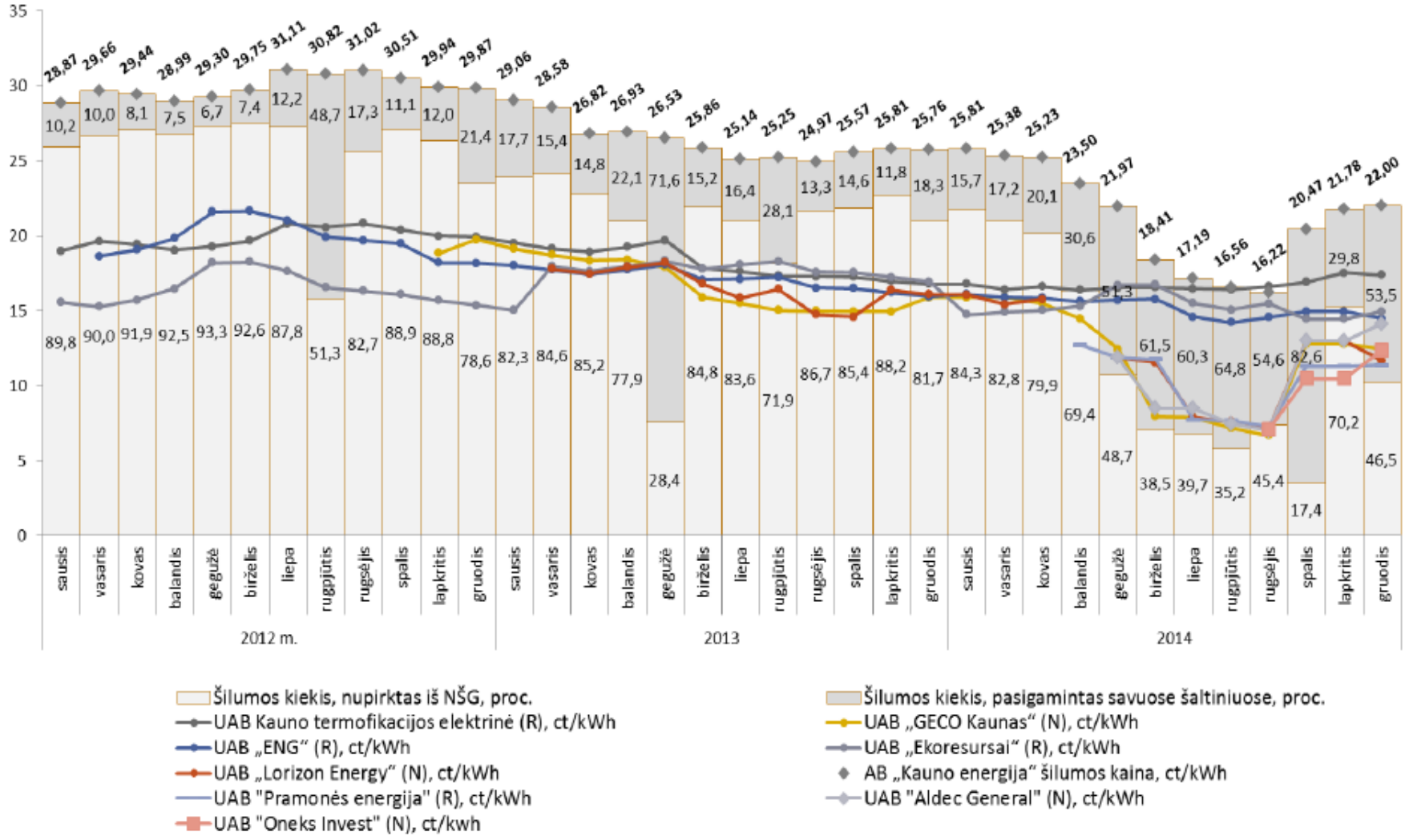
- competition among heat producers significantly increased in just 3 years in cities where the municipalities did not have artificial barriers for new IHP
- Heat trade using an auction procedure was a successful step
- Price drop of heat production due to competition is evident

Konkurencija Klaipėdoje



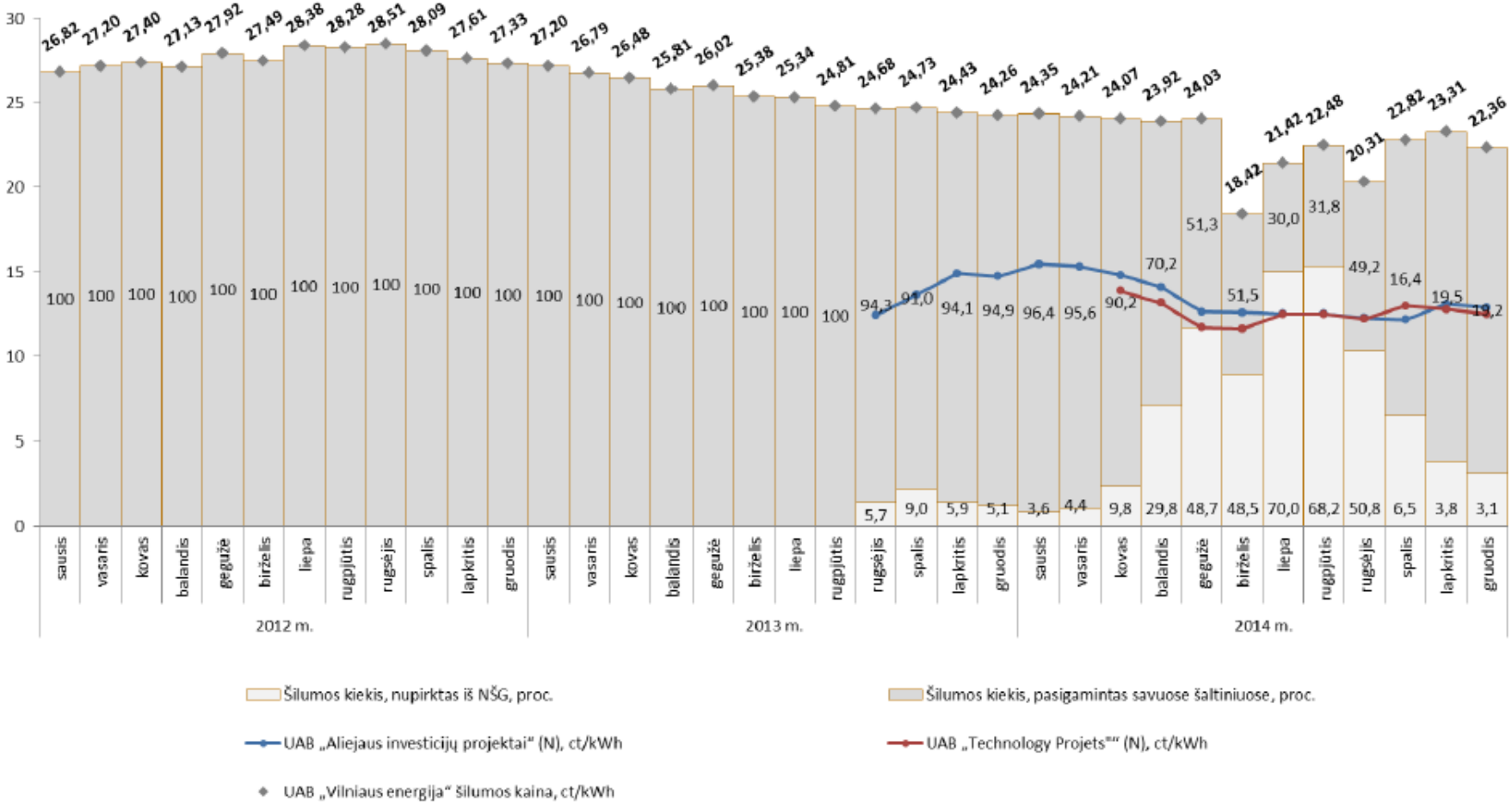
Source: dr. Darius Biekša, NCC, 23 January 2015

Konkurencija Kaune



Source: dr. Darius Biekša, NCC, 23 January 2015

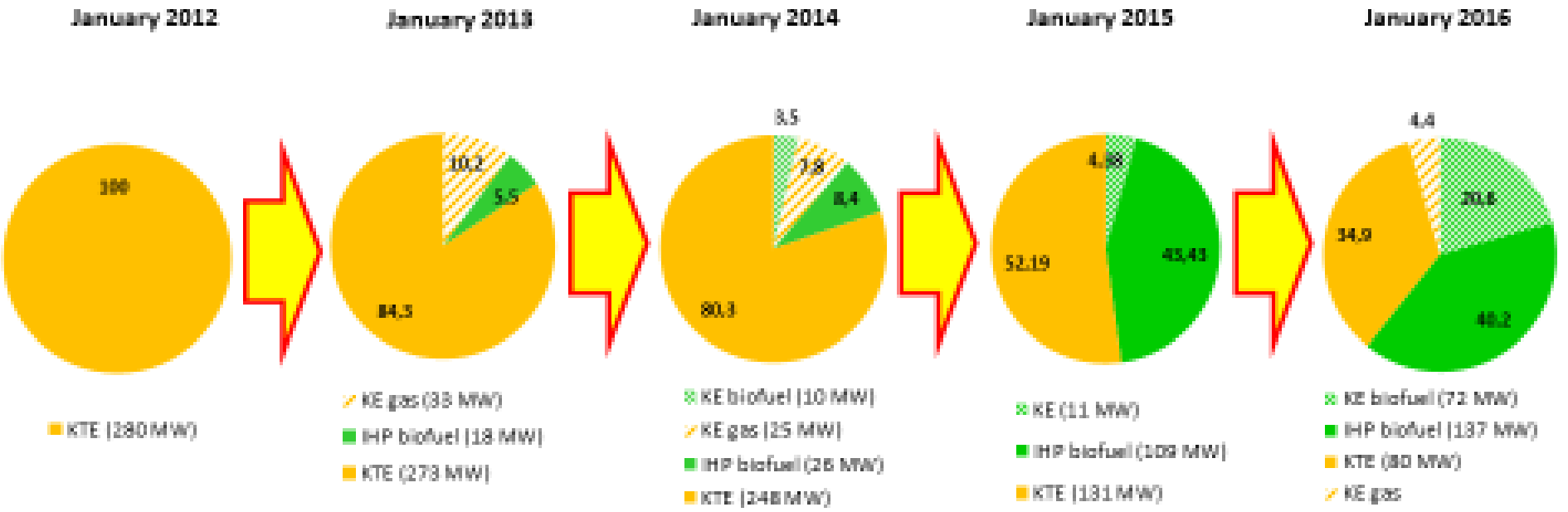
Konkurencija Vilniuje



Verkių g. 25C-1, Vilnius. www.regula.lt

Source: dr. Darius Biekša, NCC, 23 January 2015

Working capacities of heat producers in Kaunas integrated network in January 2012 – 2016, per cent



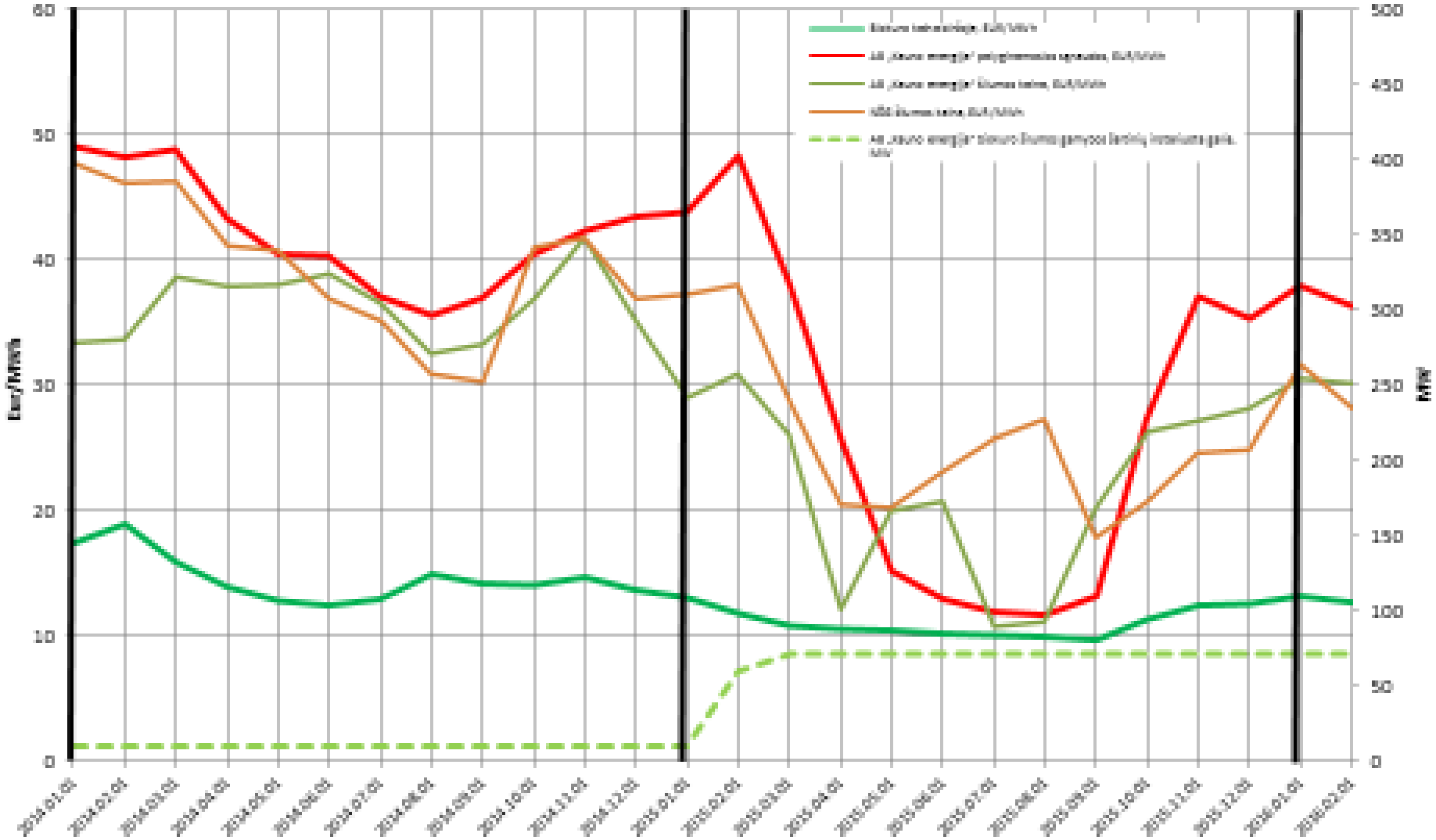
Perennial average of IN heat demand of January is 290 MW

Actual power demand was 320 MW.

UAB Kauno Termofikacijos Elektrinė already was not a dominant heat production facility in Kaunas in 2015. The amount of heat, purchased from UAB Kauno Termofikacijos Elektrinė amounted to 28.5 per cent of all heat purchased and consumed in Kaunas IN. In comparison, it amounted to 49.9 per cent of the all purchased heat in the year 2014 and to 72.6 per cent of the all purchased heat in the year 2013. The heat was not purchased from UAB Kauno Termofikacijos Elektrinė during non-heating season in 2015.

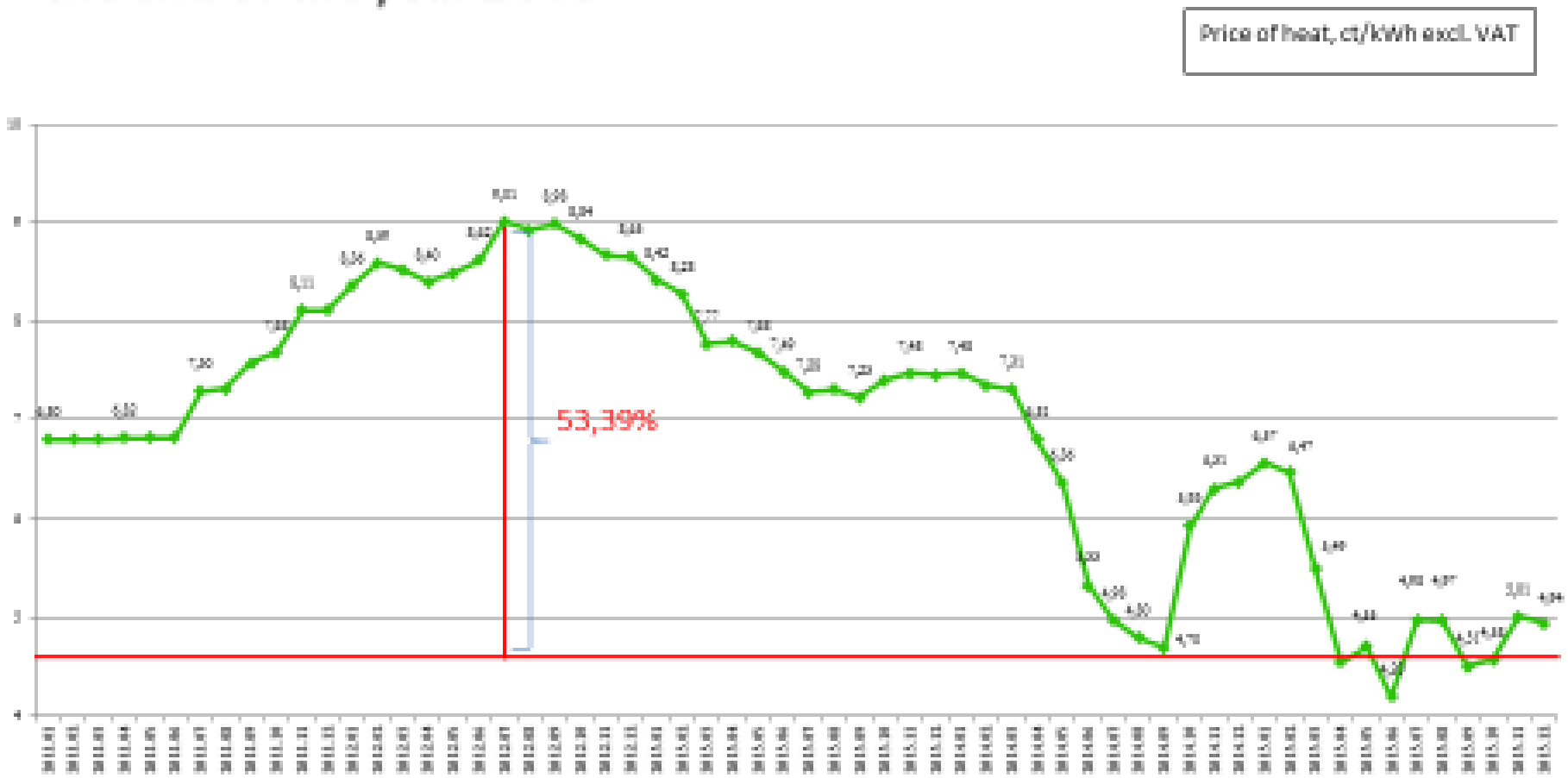
Source: dr. Rimantas Bakas, Kauno energija AB, 21 April 2016

Comparable heat production expenditures of AB Kauno Energija, prices of fuel and impact of own biofuel capacities on them



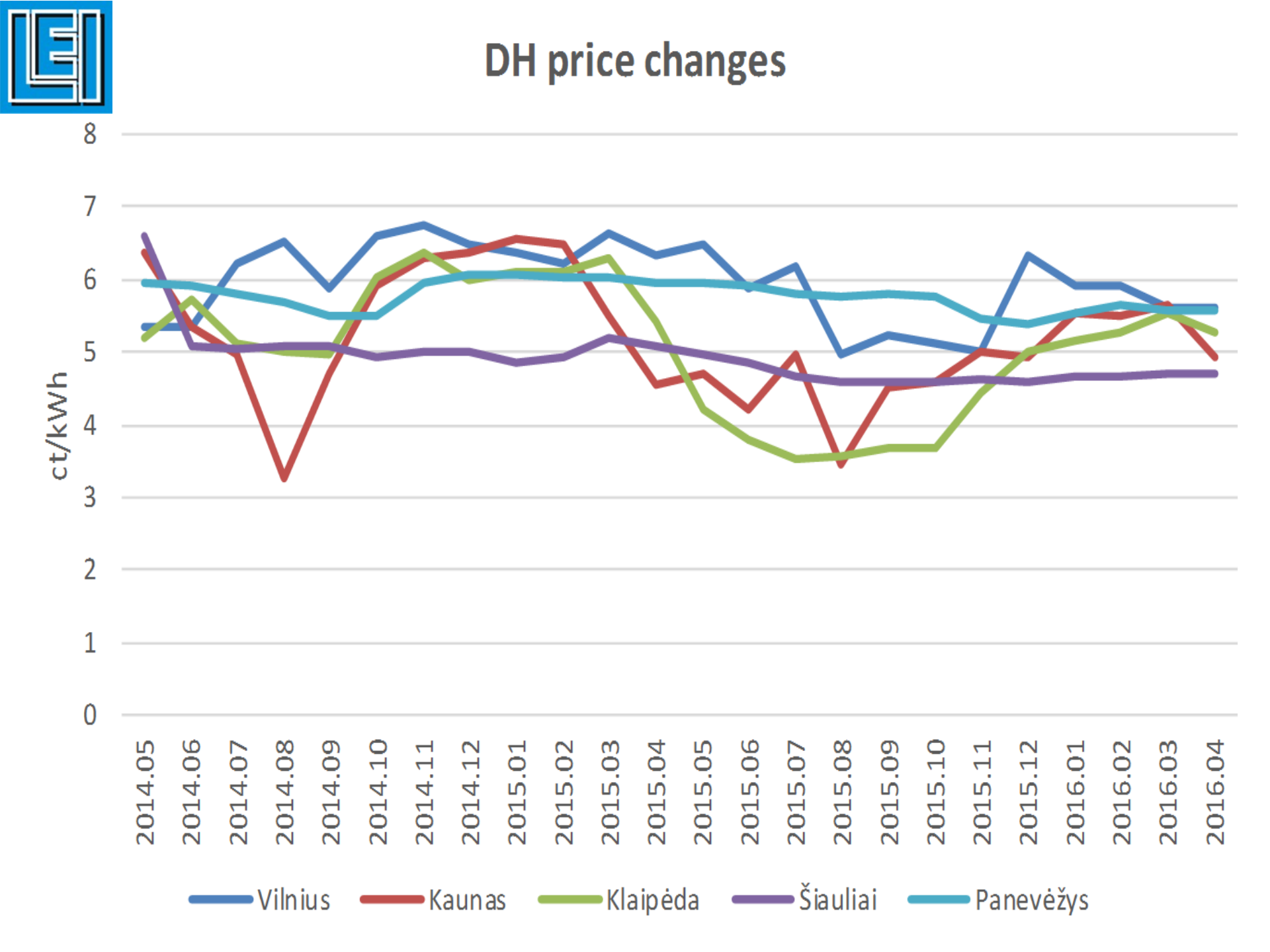
Source: dr. Rimantas Bakas, Kauno energija AB, 21 April 2016

Changes in price of heat supplied by AB Kauno energija and in price of conditional fuel from the beginning of the year 2011 until the end of the year 2015



Source: dr. Rimantas Bakas, Kauno energija AB, 21 April 2016

DH price changes



Todays situation

- The main features of the existing scheme are the following:
  - IHP in the auction should participate with the full price and can not reach the limit of DH company‘s production variable costs,
  - but the DH company is obliged to provide reserve capacity and ensure reliable and stable heat supply for final consumers.

  This scheme works well enough, untill market share of IHP is not significant
- In case IHP heat generation covers more than half of the demand, the dispatching of heat flows become complicated
- There is only one commodity – heat (kWh). After auction DH company should distribute this heat according to the actual load curve. (How much IHPs wish to work in the peak load?)
- Existing regulation are not clear in regards how DH company should buy and pay for the regulating heat and emergency reserves

Problems

- DH company includes generation and transmission capacities and play a Single Buyer role in two-stages heat auction.
- This leads the DH company to have motivation and possibilities to manipulate heat production price and to make pressure on independent producers.
- Existing heat trading rules reached its limit in the cities with advanced competition background.
- Situation is neither sustainable, nor stable.

Problems

- There is a threat, that in the case of trading rules would not properly improved, the significant concentration of ownership of heat production capacities will start.
- Incentive to concentrate a market can have both: DH company and IHPs (everybody is interested to become a price-maker in the heat production)
- In both cases, prices will rise to the detriment of consumers
- Neither Competition Council of Lithuania, nor NCC has no enough practice on market concentration cases in DH markets and their possible approach is not known (should they do barriers for concentration process or do not?).

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- To upgrade heat trading rules and to have sustainable competitive market

  or

- Take a step backwards and keep tolerance to the market concentration and competition degradation

Observations

- The discussion about which type of monopoly (or oligopoly) is better - private or public - is not viable. Perspective is a competitive market with many participants and consumer's choices.

- The free market mechanism, rather than the regulator has the ability to develop the most effective and most consumer focused market structure. This is achieved through the formation of market with the strong competitive background

The ideas
how to improve trading code
to keep strong competition
in advanced DH markets

Ideas and their argumentation:

- Kaunas DH development strategy, 2012
- Findings of Working group for the harmonization of Kaunas DH integrated network operating rules (grid code), 2013
- LEI proposals for the National heat sector development program, 2014
- Updated National Energy Strategy, 2014

1. Two versions of trade rules

Heat trade according existing rules is complicated (dependent, independent, regulated, unregulated heat producers).

In the case of two auctions procedure implementation (one heat produced from renewable sources, the other - from fossil fuels), the trading system would be even more complicated. Heat trade rules must be substantially simplified.

Better to have two versions of trading rules:

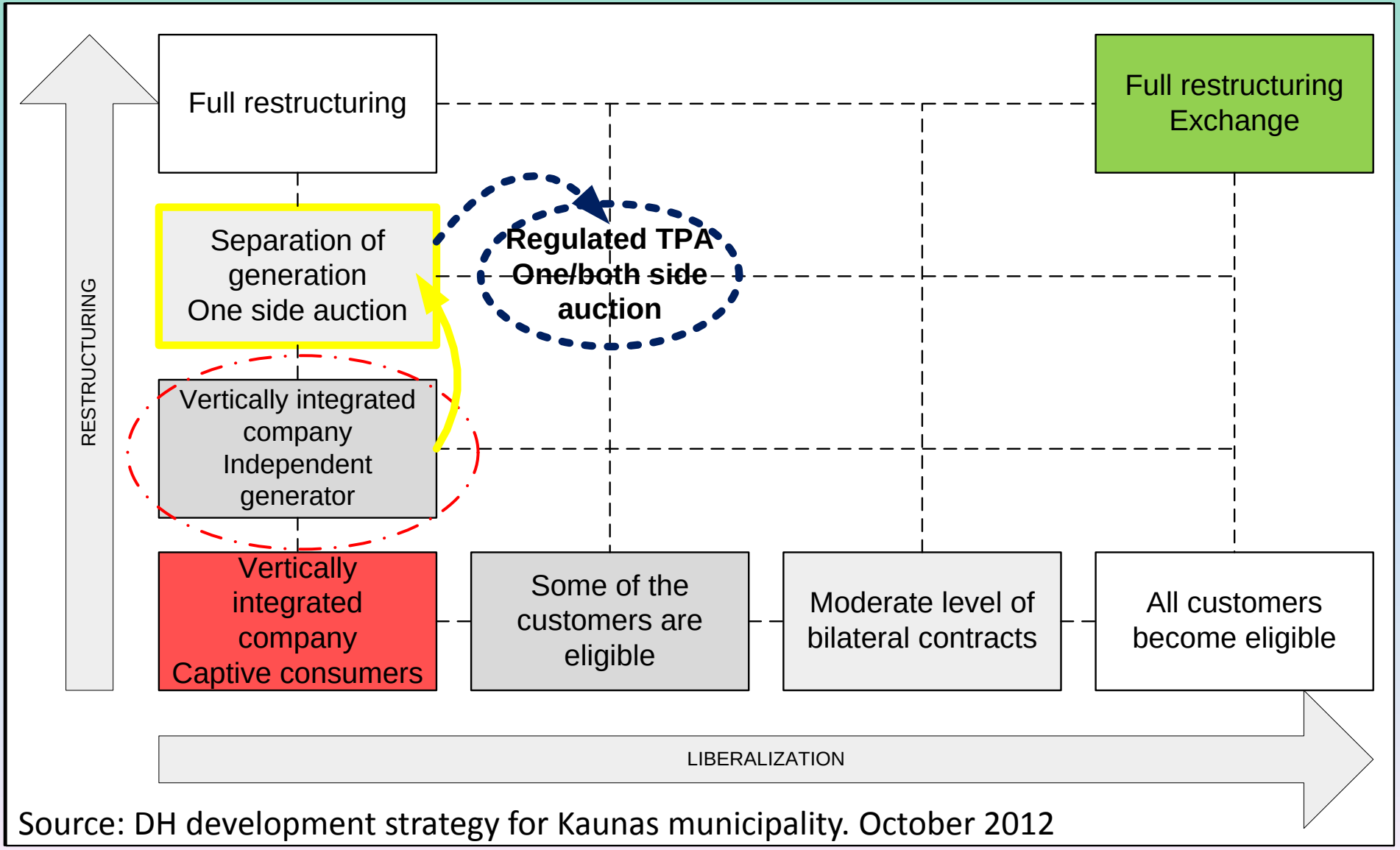
- One version for small scale DH systems with low (or without) competition level (based on existing practice)
- Other version for advanced DH systems with competition.

2. Advanced competitive DH market features:

- Heat production and transmission are unbundled,
- All heat demand is traded in auction,
- Emergency reserves are traded in auction,
- All producers participate in auction with full price
- Commodities are purchased from producers based on price priority

This is a one-side auction model. Next step - regulated Third Party Access model with one/both side auction.

Competition through liberalization



Source: DH development strategy for Kaunas municipality. October 2012

Commodities traded in auction

- Base load heat
- Peak load heat
- Regulating heat
- System emergency reserves

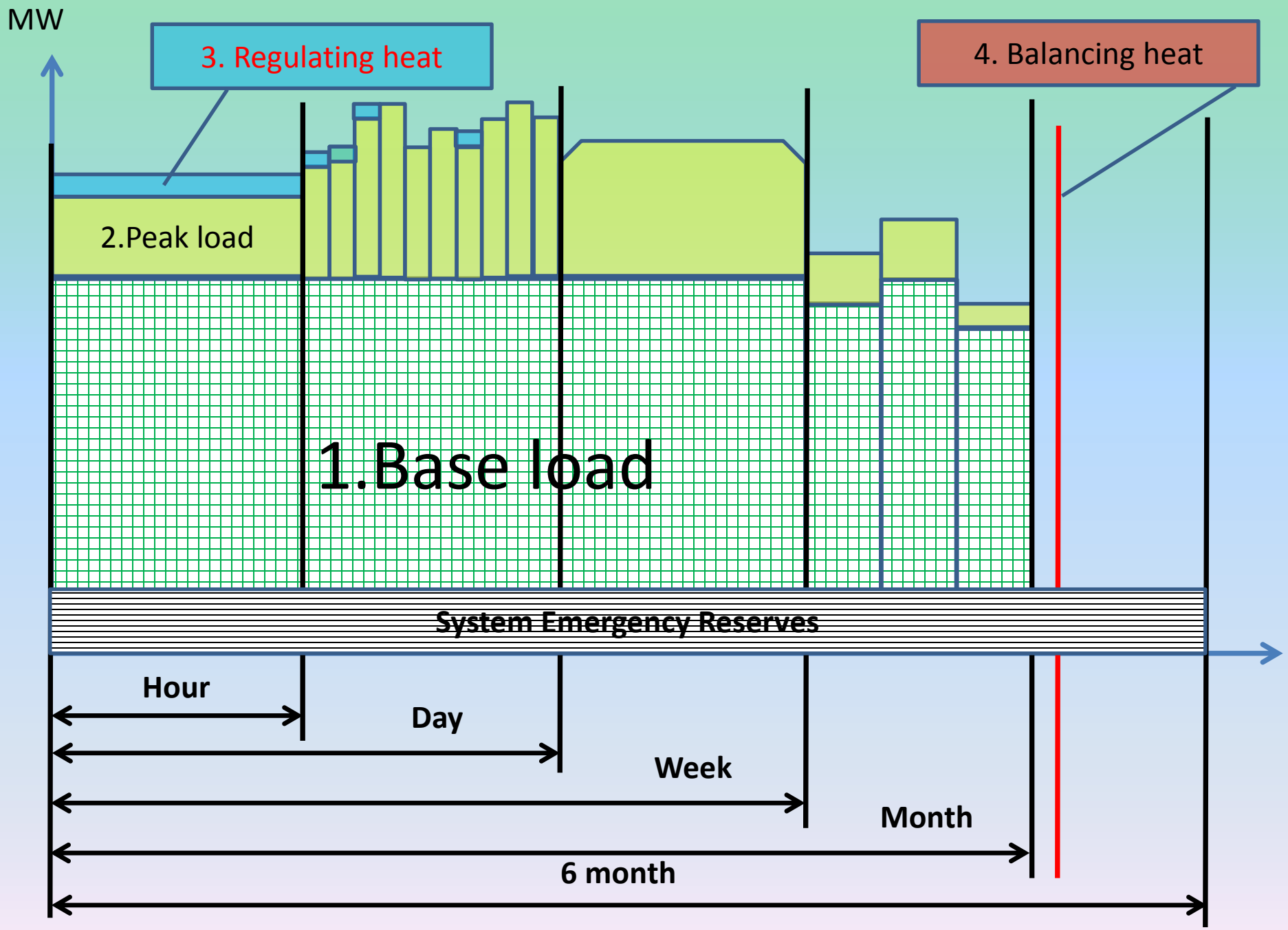
- Balancing heat – the differences between contracted generation and real generation, counted at the end of the month.
- Schedule – hourly.

Trading procedure

The basic rule of the auction process is the same for all commodities (except for Regulating Heat):

1. Network operator predicts demand of commodity (load curve) and declares it for producers
2. Producers submit their bids
3. The network operator receives bids and set producers according to the merit order
4. Network operator, having regard to the technical feasibility, buy products from producers and publishes market prices publicly

Network Operator functions: Forecaster, Trading operator, Dispatcher, Pipeline operator


MW
3. Regulating heat
4. Balancing heat
2.Peak load
1.Base load
System Emergency Reserves
Hour
Day
Week
Month
6 month

Observation

- DH company (Network Operator) is responsible for the heat delivery to final consumers.
- Security and reliability of the heat supply are ensured not by the fact, that heat generation and reserve capacities are the ownership of DH company.
- Security and reliability is the outcome because of two conditions:
  - a sufficient amount of heat generation capacity, that is connected to the network and technically ready for work,
  - well organised contractual relationship between the network operator and producers.

Necessary preconditions for such the auction model to operate successfully

- All heat producers are subject to the same conditions (without - (not) dependent (non) regulated))
- There is no technology priority queue. Support for technologies (eg., waste incineration, RES) is carried out through other mechanisms.
- The producer before joining the DH network signs the network usage contract with the network operator and declares needful technical parameters.
- Consumer needs are represented by the network operator.

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Thank you
for your patience ☺

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