Hungarian Energy Market REPORT

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Dear Reader!

The current market environment for power plant investments is rather unfavourable. To guarantee the security of supply and ensure the necessary capacities, numerous member states plan to introduce some kind of capacity mechanism. These individual national measures mean a serious threat for the integrating electricity markets, so European Union authorities tend to oppose this trend. The first article of our current report explains the most recent view of the European Commission regarding these mechanisms, and shows in which circumstances finds it possible to utilise such mechanisms.

Our second piece is about European power exchanges, which in the recent years due to market coupling projects turned into the primary tool of market integration. Close cooperation of national power markets in the same time creates a fierce competition between the power exchanges. Our article gives a short review on the European exchanges, which may be potential competitors of HUPX for operating organised power market in Hungary in the near future.

The main target of the National Energy Strategy is the curtailment of energy consumption and thus the easing of energy dependency. In the last few years residential and tertiary sector primary energy consumption displayed a considerable drop, which may be understood as the beginning of a favourable development. Whether this decrease can be explained by energy efficiency developments and the increase of energy efficient new buildings or simply the economic crisis? May other factors be the reason? How does the energy use of residential and tertiary sector develop in the next decades? We seek the answers to these questions in our third analysis.

The aim of our last article is to demonstrate the features of sectoral taxes levied on energy industry players, with a short outlook to the European situation. We assess the Robin Hood tax, which was greatly amended early this year, the already repealed sector-specific surtax, the utility lines and pipes tax introduced in January 2013 and explain the latest amendment of the local business tax. The relevance of the topic is that according to our estimates, sectoral taxes levied on the energy industry to the budget amount to 29% of the 2013 planned business tax income. This indicates that share of direct tax incomes from the sector will not decrease considerable despite the repealing of sectoral taxes.

I sincerely hope that our analyses are worthy of your attention and our articles help the better understanding of the energy sector developments in Hungary.

Péter Kaderják, *director*

ENERGY MARKET DEVELOPMENTS

During the third quarter of 2013 (July to September) there were minor changes on the regional energy markets. The price of crude oil after a growth trend has been reversed and is now decreasing. The price of natural gas remained unchanged, while the price of coal continues to slowly decline. The German electricity prices are no longer falling, but it is too early to say whether this is an actual change in trend.

The quarterly electricity consumption grew by 2% in comparison to the same period in the previous year. The share of imports continued to increase; and now more than a third of the electricity demand is satisfied through imports. Due to the higher share of imports and bottle-necks in cross-border capac-ities, the Hungarian day-ahead prices broke away from other regional prices.

On the natural gas markets the injection period was concluded, the utilization of storage capac-ities were low at 42% at the end of September. This is 26% lower than the amount injected in the previous year.

International price trends

In 3Q of 2013 the prices of the two main energy carriers, oil and coal have split. The price of Brent crude oil increased from 100 USD/barrel in June to 120 USD at the beginning of September, then within a short period of time it dropped back to 108-110 USD. Contrary to this, the price of ARA coal futures barely changed in the relevant quarter; the price continuing to fluctuate around 80-85 USD/ton.

The decline of electricity futures prices continued in the first half of the given period. By August, the price of German base load electricity declined to 36 EUR/MWh from the previous year's 50 EUR/MWh, and in the first weeks of September the price increased to 39 EUR/MWh due to the increased demand by traders who were aiming to close positions. The price of peak load electricity followed the same trend and at the end of the period it closed at 50 EUR/MWh. Significant change in natural gas futures prices in this quarter was not observed.

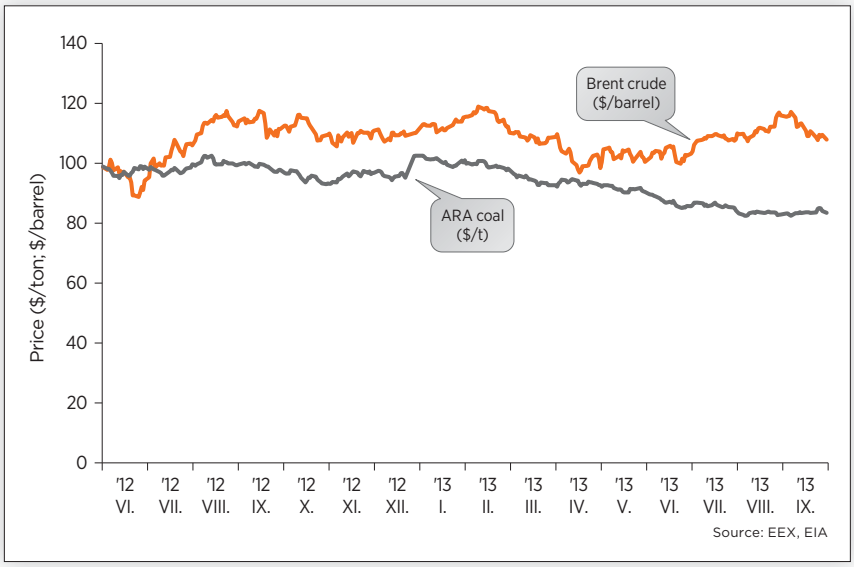


Figure 1 **The price of 2014 ARA coal futures traded on EEX and the spot price of Brent Crude between June 2012 and September 2013**

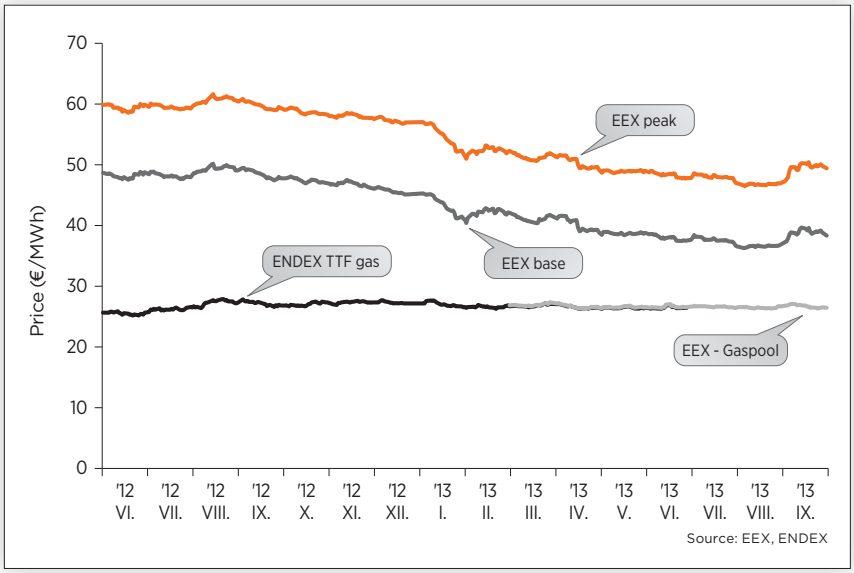


Figure 2 **The futures price of 2014 electricity and natural gas between June 2012 and September 2013**

Since 3Q of 2013 the ENDEX TTF prices are no longer publicly available, therefore we depicted the Gaspool annual futures prices traded on EEX. At the same time it is clear that the two prices are tied to each other; the latter has the same price levels as the ENDEX TTF.

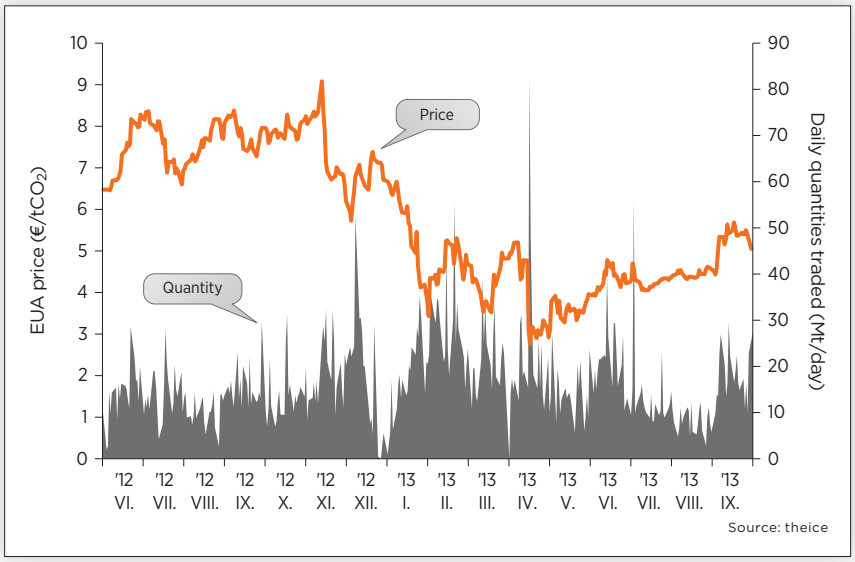


Figure 3 The price of CO_2 quota with a December 2013 delivery date, and the daily traded volume between June 2013 and September 2013

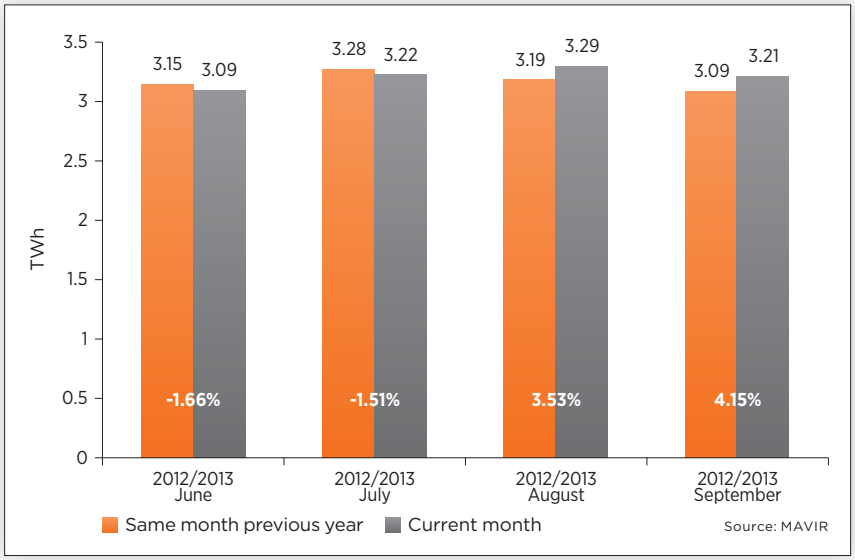


Figure 4 Temperature and working day adjusted electricity consumption between June 2013 and September 2013 relative to the same period of the previous year

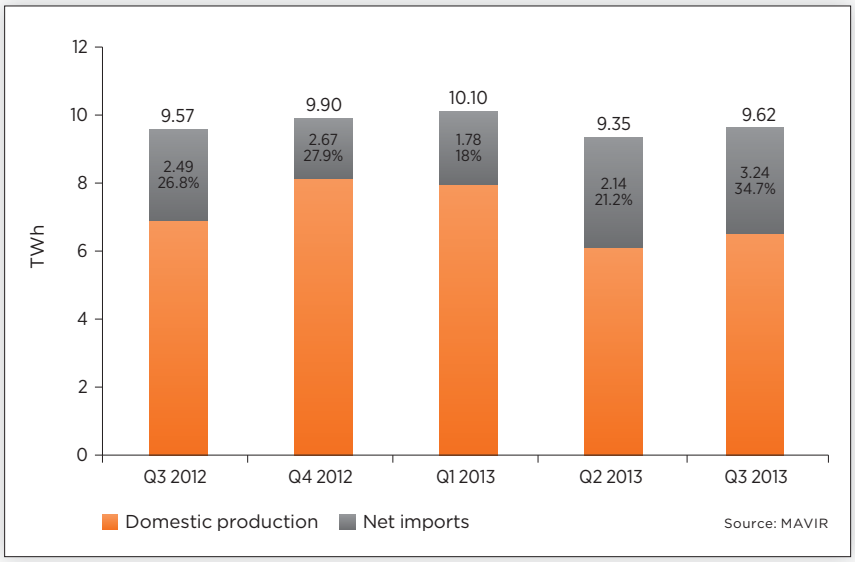


Figure 5 Quarterly domestic electricity production and net imports between Q3 2012 and Q3 2013

The price of emission rights with a December 2013 expiry was 4 EUR/ton at the beginning of this quarter. Up until the beginning of September, the price of the EUA fluctuated at this level, and then it suddenly rose by 1 EUR/ton, retaining this price level until the end of September.

Overview of the domestic electricity market

The quarterly temperature and working day adjusted electricity use was 9.7 TWh, which is 0.2 TWh or 2% higher than last year. The consumption between different months had significant differences: while in July the network usage was significantly below that of the previous year, in August and September the consumption increased by 3.5-4.2%.

The gap in prices of electricity between domestic power plants and imports has been growing since the spring of 2012; therefore imports constitute an increasing proportion of domestic consumption in the last year and a half. In 3Q, the ratio of imports was surpassed 34%, which is 8% higher than in the previous year. The scale of increase in the balance of imports is significant, the total sum of imports in the first three quarters of the year has already been surpassed the total import for 2012, and approached 8.5 TWh.

At the monthly cross-border capacity auctions the price of Austrian and Slovakian import exceeded 6.5 EUR/MWh. At the same time, this value is not exceptional in summer-time, as the price of

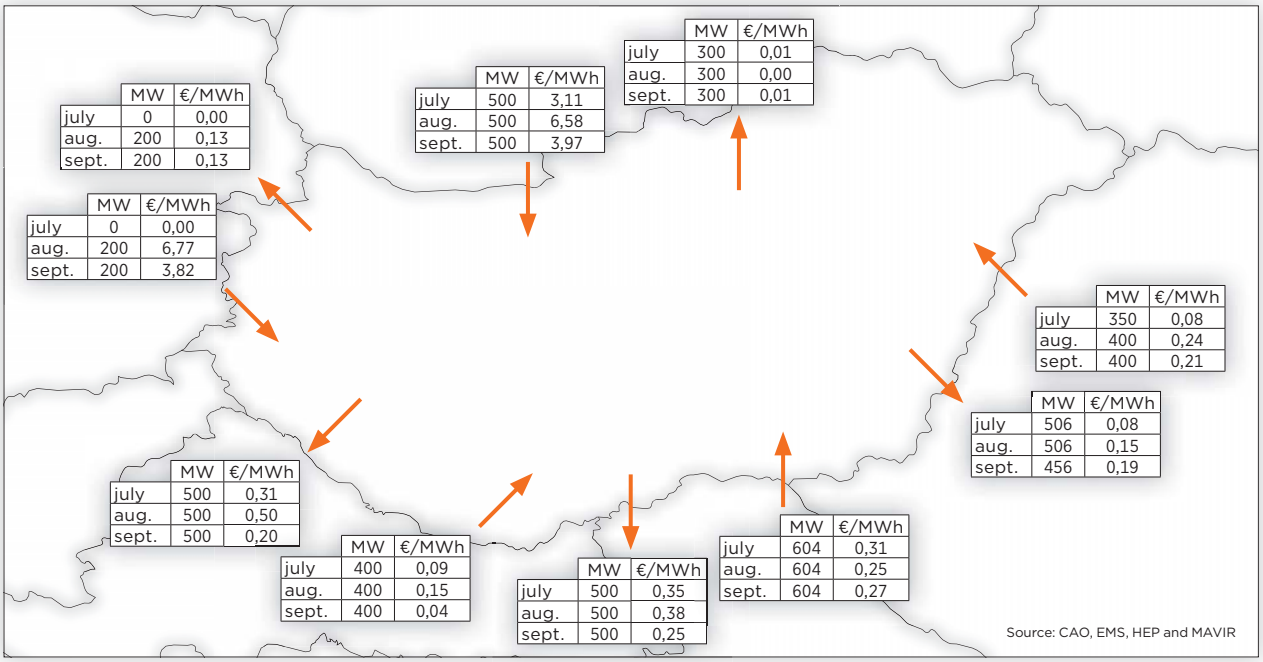


Figure 6 **The results of monthly cross-border capacity auctions in Hungary, Q3 2013**

Capacities in the figure mean capacities offered for auction. The only cases when capacities were not sold completely in the period under review were in cases of over-subscription at a specific price, because in such cases the system operator considers the next highest price as the auction price.

this cross-border capacity for the same period in the previous year surpassed 14 EUR/MWh. In July and September the price of import capacities from these states fluctuated around 3.5 EUR/MWh, not including the July import from Austria, which case there was no monthly capacity auction right distributed. In case of the other borders the cross-border capacity prices were below 1 EUR/MWh.

At the beginning of the 3Q the day-ahead prices at HUPX continued to move away from the prices on other regional exchanges. The Hungarian day-ahead prices were above the German EEX exchange prices by 8 EUR/MWh in July and 9 EUR/MWh in August, mostly due to the unexpected maintenance works at the power plants at Paks and Mátra. However, this tendency changed once the maintenance of works at the power plants and cross-border capacities were completed and the price difference shrunk to 5 EUR/MWh

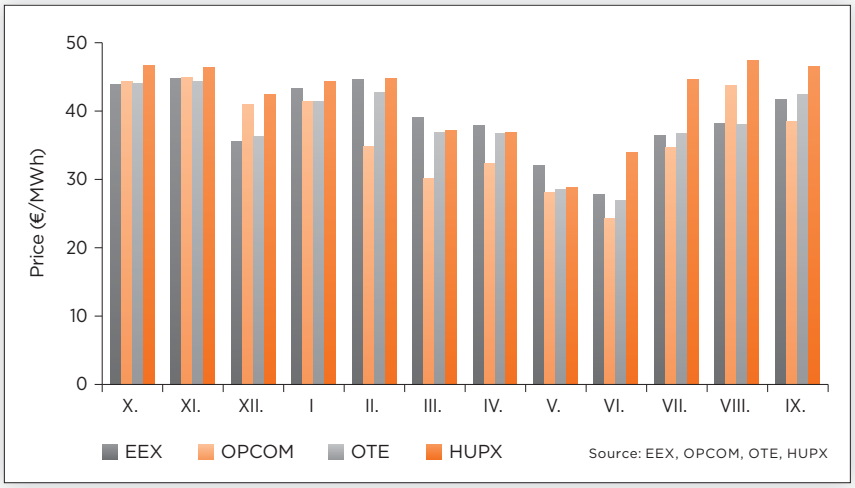


Figure 7 **Comparison of day-ahead prices of baseload power on EEX, OPCOM, OTE and HUPX between October 2012 and September 2013**

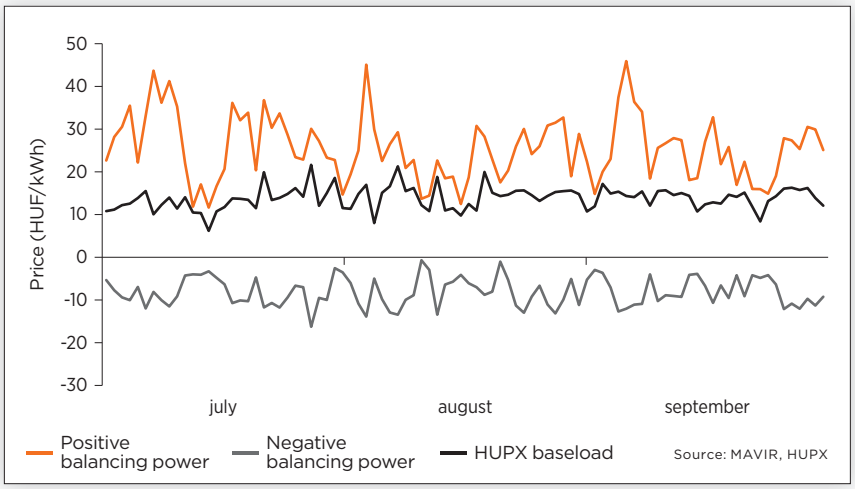


Figure 8 **The daily averages of the balancing energy and spot HUPX prices, Q3 2013**

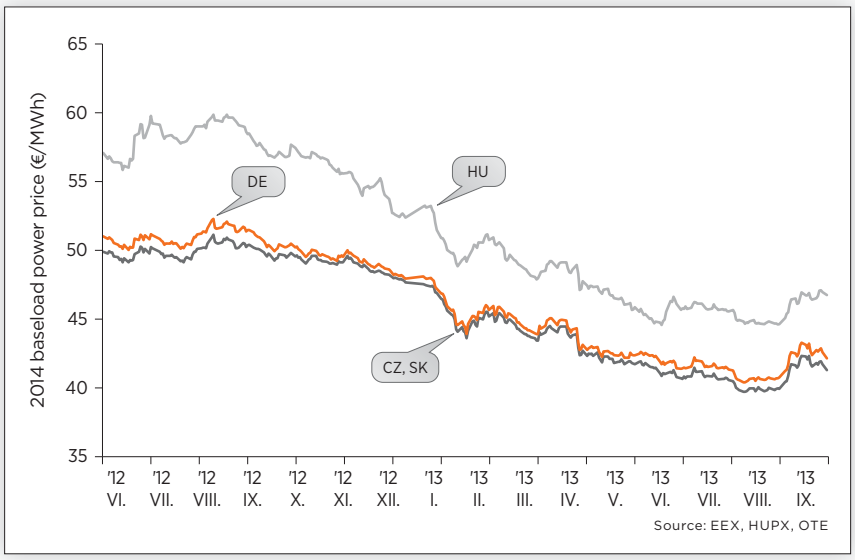


Figure 9 Baseload futures prices quoted for 2014 delivery in the countries of the region between June 2012 and September 2013

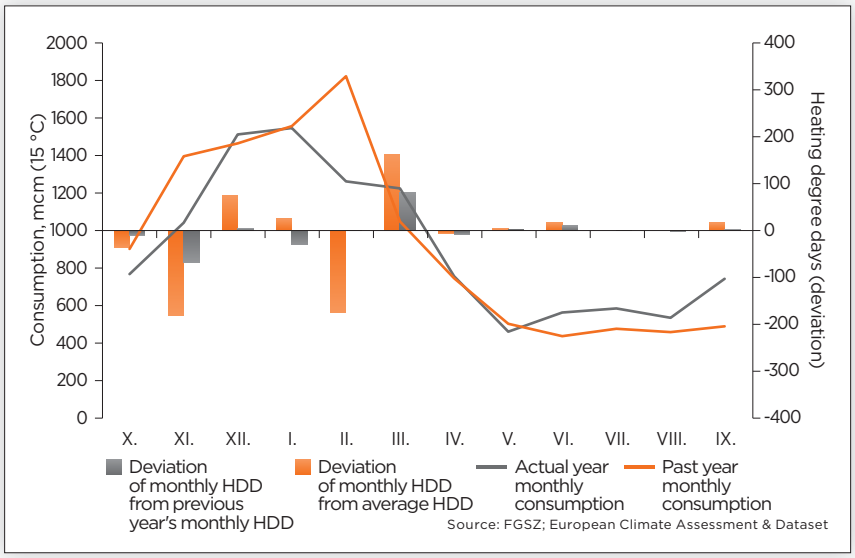


Figure 10 Monthly natural gas consumption between April 2012 and March 2013, compared to the natural gas consumption in the same months of the previous year, and compared to the difference between the monthly heating degree days and the multi-year average HDD figures and that of the previous year

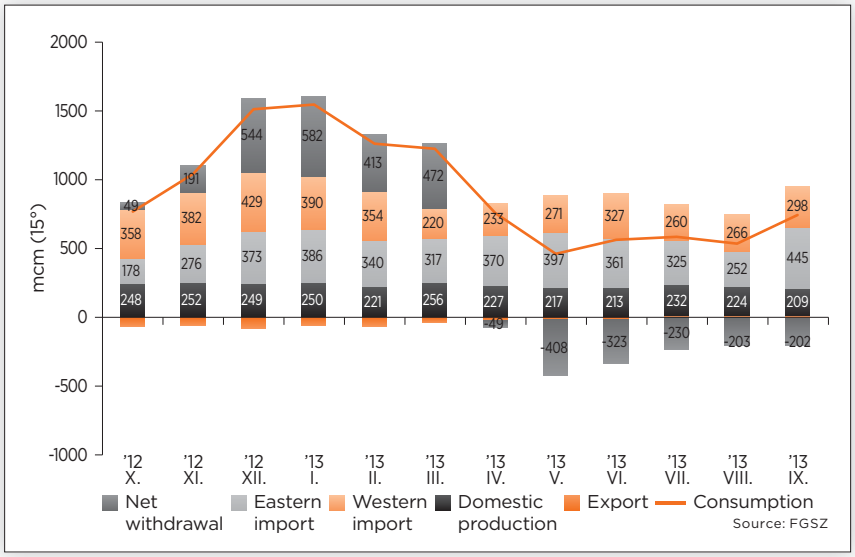


Figure 11 The source of the gas consumption of Hungary by month between April 2012 and March 2013

in September. The Czech prices were almost equal to the German prices during this quarter, while compared to the German prices the Romanian prices were slightly lower in July and September, and higher in August.

The wholesale price of electricity is influenced by the costs of deviations from the schedule and the balancing energy prices as well. The system operator sets the settlement prices of daily upward and downward regulation based on its procurement costs of energy from the balancing market. The financial costs of balancing for the balance circles are determined by the balancing energy prices and the spot price of electricity in the settlement period. The higher the difference between the price of upward and downward regulation and the spot wholesale price, the more it costs to acquire the required amount from the balancing market. During Q3 the price of positive balancing energy was 25.5 HUF/kWh on average and the price of negative balancing energy was -8.2 HUF/kWh on average.

The price of the futures baseload product did not show significant, trend driven changes in 3Q. The Hungarian prices for the 2014 futures baseload product stagnated during the summer months, or showed a slight decrease, then in September followed the German baseload price and increased to 44 EUR/MWh. The price of the German shipped baseload product was below this level by 5 EUR/MWh, while the Czech prices offered a 1 EUR/MWh discount in comparison to the German market.

Overview of the gas market in Hungary

The gas consumption in 3Q significantly surpassed last year's consumption, by 440 million m³. Although the HDD value was somewhat higher than in the previous year, this was not on such a scale that this could explain such an increase. Based on our current estimation consumption in 2013 will be slightly above 11 billion m³, exceeding the previous year's value by a few hundred million cubic meters.

On Figure 10 the heating degree days (HDD) on the right axis indicate the heating requirement. To calculate the HDD we look at the daily mean temperature. If it is below 16 Celsius degrees, then the daily HDD is the difference between the 16 degrees and the daily mean temperature. The monthly HDD is the sum of the daily HDDs. By comparing the actual monthly HDD to the value from the previous year and the average HDD values we can determine how cold the given month is in relative terms. Thus, the positive values stand for lower temperatures and higher gas consumption, and the negative values stand for higher temperatures and lower consumption.

The quarterly national production was 666 million m³, corresponding to the production data of the previous quarter. Net imports were 1.86 billion m³, 44.6% of which was delivered from the west and 55% from Beregdaróc.

The gas reserve level in storage facilities was at a record low in June, the commercial storage capacities were only filled at 30%. By the end of the injection period this value increased to 42%. At the end of

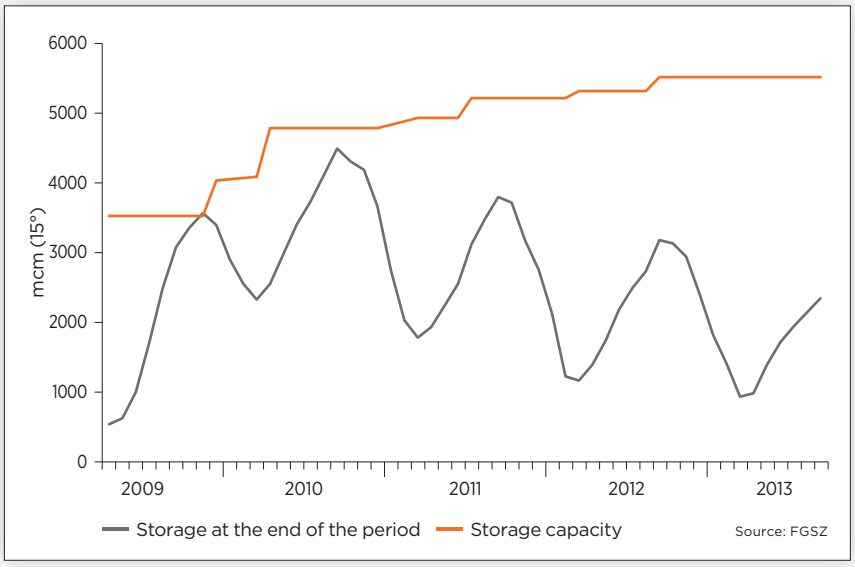


Figure 12 The working gas storage capacity of commercial storage facilities and their stocks by month

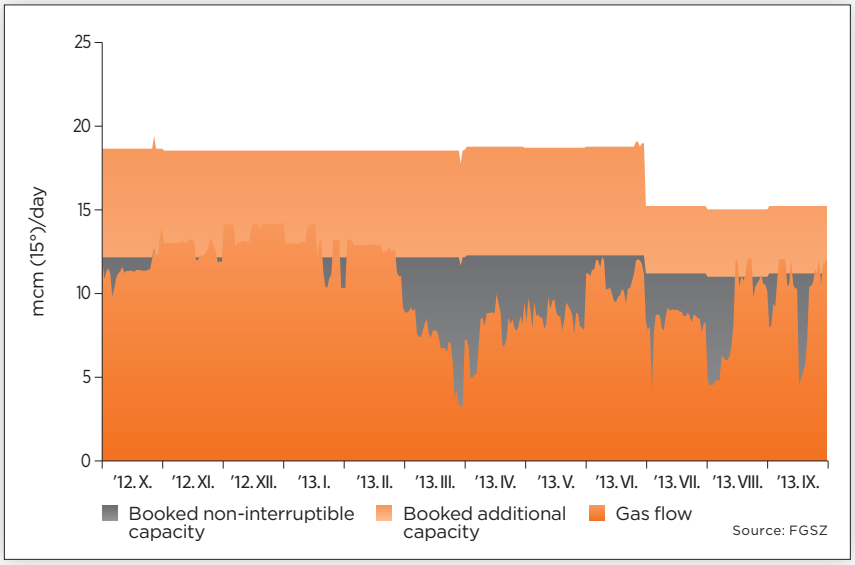


Figure 13 Transmission traffic at the Baumgarten entry point between April 2012 and March 2013, in addition to contracted interruptible and non-interruptible capacities

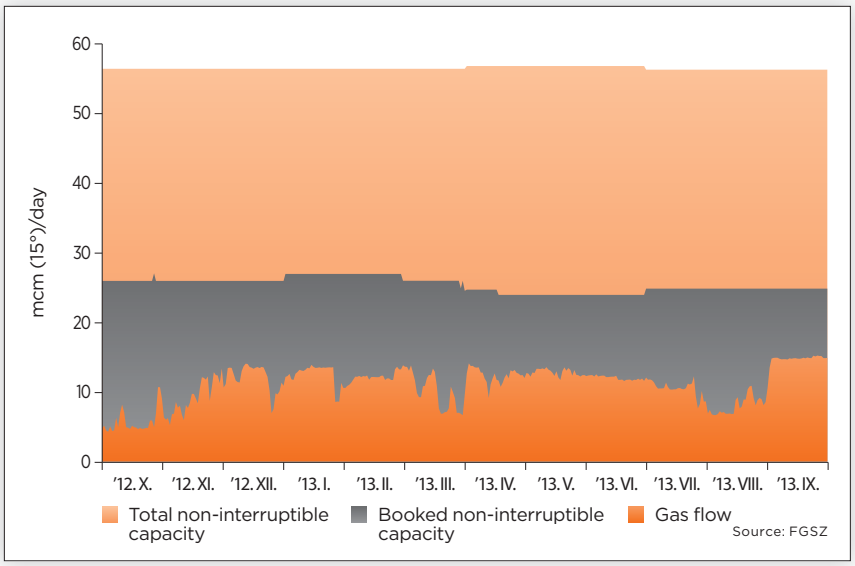


Figure 14 Transmission traffic at the Beregdaróc entry point between October 2012 and September 2013, in addition to the total available capacity and contracted non-interruptible capacity

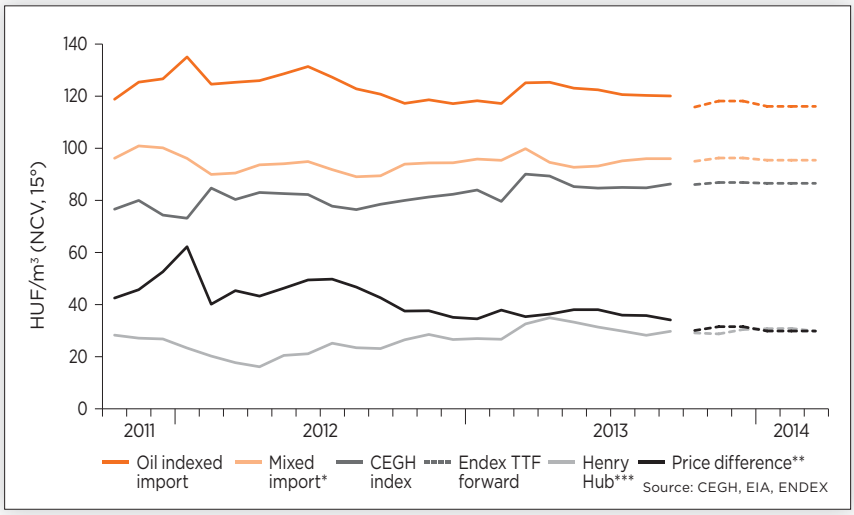


Figure 15 **Past and forecasted international and domestic wholesale gas prices**

** Weighted average of the oil-indexed and the ENDEX TTF gas price on the exchange, with a 60:40 ration until September 2011, and a 30:70 ratio afterwards.*
*** The difference between the oil-indexed and CEGH prices.*
**** Cubic meter price of the Henry Hub wholesale gas price, exchanged at the average/nominal exchange rate of the Central Bank of Hungary.*

the quarter the gas storage facilities had 2.3 billion cubic meters filled, which is 26.5% lower than in the previous year. Therefore, the trend of a growing difference between working gas capacities in commercial storages and the actual stored stock, noted in recent years, continued in 2013 as well.

During the quarter, 800 million m³ gas import arrived through Baumgarten, which equals the data from the previous quarter, but at the same time it remains short of the previous year's imports by more than 200 million cubic meters. 80% of the contracted, non-interruptible capacities were utilised.

A total of 1 billion cubic meter gas was delivered via the eastern border during Q3, which means a 400 million or 60% increase in deliveries from Beregdaróc in comparison to the previous year. However, this increase can be explained by last year's very low import level. In 3Q of 2011, imports were 950 million cubic meters, which was only 7% lower than the current import level.

The price of oil-indexed gas import – due to the Forint exchange rate strengthening against the dollar – decreased from the 122-125 HUF/m³ level of the previous quarter to a price level of 120 HUF/m³. The mixed import price constituted from 70% exchange-based and 30% oil-indexed price, which is the import price acknowledged for the universal service providers, increased slightly by 1-3 HUF/m³ to 95 HUF/m³ from the 92-94 HUF/m³ typical of the previous quarter. Due to the assumed moderation of the Brent crude oil price in the coming months, we expect that the gap between the oil-indexed and exchange-based prices will decrease.

ENERGY MARKET ANALYSES

Second-best option? Guidance of the European Commission's November communication regarding capacity mechanisms

Following a public consultation about capacity mechanisms initiated in 2012, the European Commission issued a communication in November 2013 regarding the support of renewable energy sources, public interventions aiming generation adequacy, and – in relation with these – also demand side flexibility.[1] Our aim here is to highlight the most important statements and suggestions of the Commission related to capacity mechanisms.

In an earlier article we have already dealt with the question of capacity mechanisms *(REKK Report 2013/2)*: such mechanisms are already in place in a number of European countries, and are being planned by some others with the aim of ensuring that an adequate level of electricity generating capacity is being built or kept online. In most countries such mechanisms are predominantly intended to support gas-fired power plants, which play a central role in providing supply-side flexibility, but are nowadays usually underutilized and operating with low profitability. However, the impact of these support schemes on the relative competitiveness of power producers in different countries could be large enough that it may endanger the functioning and integration of European energy markets. Furthermore, caution is needed when designing support mechanisms to avoid unintended effects on the national or neighbouring markets.

The European Commission's communication tries to respond to the abovementioned worries. In this, the Commission formulates recommendations about the conditions under which introducing a capacity mechanism can be reasonable, and it also delineates potentially less distortionary alternatives to capacity mechanisms.

Most importantly, the communication states that the introduction of capacity mechanisms can only be justified if all of the following conditions hold at the same time:

- a Member State carries out an objective national generation adequacy assessment in line with the ENTSO-E Union-wide generation adequacy analysis – also taking into account the cross-border nature of electricity markets –, and concludes that generation inadequacy is a serious problem;
- the Member State proves that generation inadequacy is a result of market failure: that is, the market, left alone, cannot provide an adequate level of electricity generating capacity;
- the Member State identifies and removes all factors which can potentially hamper investments into generation, i.e. existing subsidies for fossil-fuel based and nuclear power plants, as well as all regulated prices, wholesale and retail (excluding social prices for vulnerable consumers). Speaking about capacity mechanisms the communication emphasizes that "[s]uch interventions should not compensate for the negative impact of other subsidies or poor implementation of internal market rules";
- and lastly, the Member State after taking into account all possible alternatives – including interventions for the advancement of demand-side flexibility and end-use energy efficiency (e.g. the roll-out of smart metering), and also the investments in new cross-border interconnectors – concludes that these alternatives are unable to solve the identified problem.

Based on these criteria we can see that the Commission aims to limit Member States' possibilities for introducing capacity mechanisms, and tries to get Member States to apply potentially less expensive and less distortionary alternatives, in particular interventions helping the wide-scale adoption of demand-side flexibility.

These alternative measures – most importantly the incentivizing of demand-side flexibility and investments in cross-border transmission capacities – play a central role in the communication: by this the Commission is arguably emphasizing that introducing a capacity mechanism is neither the only solution for mitigating the problem of generation inadequacy, nor it should be seen as a preferred option. The communication stresses the importance of interconnectors by highlighting that according to the latest network assessment by the ENTSO-E there is overcapacity on several European electricity markets, meaning that

[1] Communication from the Commission number C(2013) 7243 about "Delivering the internal electricity market and making the most of public intervention" (published on November 5, 2013)

generation inadequacy on any national market can partly be traced back to structural problems, which could be alleviated by importing electricity from markets with overcapacity. It should be noted, however, that this suggestion does not take into account that some Member States may differ regarding how inclined they are to rely on neighbouring countries' generating capacities when considering their own security of supply.

Considering demand-side flexibility, the communication mostly emphasizes its unused potential – according to an assessment cited by the Commission, demand-side measures could potentially reduce peak loads by 10% in the whole of the European Union, or by one-third of all gas-fired generation capacity. However, there is a number of reasons behind the under-utilization of demand response in most states: regulatory deficiencies, the insufficient level of the necessary infrastructure (e.g. smart metering), the price inelasticity of consumption, the lack of underlying services (e.g. incentive tariffs) on the market, etc. Thus, save for the existing incentives for smart metering rollout, the Commission's communication provides little guidance on how to eliminate these barriers.

According to the Commission, if a Member States concludes that generation inadequacy is problematic, and it cannot be remedied without implementing some form of capacity remunerating mechanism, then the Member State can take the following actions:

1. it can establish a strategic reserve;
2. it can carry out a credibly one-off tendering procedure for electricity generating capacity;
3. or it can create a market-wide capacity mechanism.

The above list is ordered from most to least preferred actions. According to the assessment of the Commission strategic reserves have the least market distorting potential: first, because these operate separately from wholesale markets (they are activated only on the mandate of TSOs), second, because they avoid the "wait for the tender" problem – i.e. unlike in the case of capacity tenders, there is no incentive for investors to postpone investments in generating capacities until a tender takes place –, and third, because strategic reserves are easily reversible. At the same time while a one-off capacity tender entails the risk of postponed investments, it is also a procedure that is relatively easy to carry out and has the advantage of ensuring that the entire procured capacity will indeed be constructed. In contrast, the communication warns that a market-wide capacity mechanism could entail large costs (for instance, the common mechanism operated by Ireland and Northern Ireland costs 15 EUR/MWh, while the American PJM costs 5.50 EUR/MWh), while there is also a risk of under- or overcompensating investors: these factors suggest that Member States should rely on such market-wide mechanisms only as a final, least preferred option.

While the communication predominantly gives recommendations, it is important to highlight that the Commission calls attention to EU laws and Member States' obligations based on them: in particular, that EU legislation – for example competition rules and decisions as well as provisions of the Electricity Directive 2009/72/EC – require the identification and elimination of all factors hampering market forces. The communication warns that Member States are obliged to notify their national generation adequacy reports to the Commission. Moreover, based on legislation on either state aid rules or the electricity market, the Commission may have the obligation to investigate Member States' public interventions aiming generation adequacy, and to oblige Member States to carry out a comprehensive generation adequacy assessment and notify it to the Commission. The Commission also points out that in case a Member State happens to decide on implementing a capacity remunerating mechanism, it should take into account the objective of phasing out fossil fuel generation subsidies by 2020. We should note that this is a rather tangible threat from the part of the Commission, which means that in case a Member State implements a capacity mechanism while leaving its existing regulated prices and subsidies for fossil-based generation untouched, then the Commission will be ready to initiate an infringement procedure referring to forbidden state aid.

The communication, however, has little to say about by what specific means the European Union will be able to help the implementation of the alternative measures mentioned above. While it gives recommendations on the expansion of cross-border transmission capacities as well as the implementation of demand side response, the only indication the Commission gives about a Union-wide legislation or support of these actions is that it intends to help these by the timely transposition of the energy efficiency directive by June 2014 the latest – we can hardly see this as a measure solving generation inadequacy problems of Member States once and for all.

To sum it up, it is clear that the European Commission recognizes the danger for the internal energy market inherent in unilaterally adopted capacity remunerating mechanisms. Since the Commission does not currently have the means to keep Member States from implementing a capacity mechanism, for now it resides to advice Member States to apply alternative measures, and relies on its existing tools when stepping up against a state: that is, on its right of consultation regarding generation adequacy assessments, and also on EU laws and directives mandating either the elimination of existing subsidies for power plants or the abolition of retail and wholesale price regulations.

For now, the most important threat for the Member States is that the Commission can initiate against any state either an investigation regarding the lack of compliance with the EU competition law or an infringement procedure referring to inadequate implementation of the EU directives. However, even in these procedures the Commission has a limited elbow room, since the Electricity Directive 2009/72/EC explicitly allows tendering for capacity procurement. The Commission's communication leaves the question open what legislation and financial incentives the EU will be able to put in place for the defence of competitive market conditions and European market integration, should the current laws and incentives prove insufficient in keeping Member States from the unilateral implementation of capacity mechanisms.

A short review of power exchanges

Since its three years in operation, HUPX the Hungarian power exchange has been continuously growing both by means of membership, trade volumes and products. Besides Hungarian market players, international companies have joined HUPX as well; not only Hungarian companies do trade in the organised power market – nearly three quarter of the registered companies is actively participating in other regional power markets. From 2011 on, besides day-ahead trading, futures products were introduced. In September 2012, the Hungarian and Czech-Slovakian markets were coupled, resulting in considerable growth in trade volumes and converging prices. The Hungarian Gas Exchange CEEGEX, owned by HUPX, was launched in 2013. The aforementioned continuous development may imply that HUPX has a stable position in the Hungarian electricity market.

However, according to the working draft of the day ahead and intraday market coupling capacity allocation and congestion management guideline,[1] published in November 2013, the current practice that the power market is exclusively organised by a national exchange may not be sustainable. Pursuant to the working draft, each member state may appoint a nominated electricity market operator (NEMO) in an open and non-discriminatory way, which operates day-ahead and intraday markets and facilitates market coupling. NEMOs may operate power exchanges in other member states as well, so it may be possible that the Hungarian power market is operated by another European power exchange. We must note that this is not an unprecedented example, for instance Hungarian forwards can be traded in PXE and the HUPX as well, or the UK Power Spot may be purchased in APX and N2EX – operated by NASDAQ OMX – as well.

The main question of our article is how much do market developments carried out by the Hungarian power exchange guarantee the current position of HUPX in a more competitive environment, where the exclusivity of power exchanges ceases and rivalry between European power exchanges strengthens. To answer this question, we first review the potential competitors, introduce the guidelines for the appointment of NEMOs and evaluate the status of HUPX based on the aforementioned criteria.

Possible competitors

Most of European power markets – apart from a few exceptions – were founded in the early 2000's. These exceptions are: Nordpool day ahead market in Scandinavia was already open in 1993, first day-ahead trades took place in 1998 in Spain, and the Dutch APX was founded by market participants in 1999. The increasing liquidity, standardized products and daily market signal produced by the exchanges urged the European countries to form such organised power markets, either by state incentives or by voluntary action of market participants. So exchanges may be purely state-owned, TSO-controlled or supervised by venture capital.

Exchanges may not only be classified by the circumstances of their founding or ownership structure, but also by products traded. This may offer a better comparison, since this way the potential competitors to the Hungarian market can be identified easier.

[1] Regulation establishing a Network Code on Capacity Allocation and Congestion Management and a guideline on Governance supplementing Regulation (EC) 714/2009. Working Draft. *http://ec.europa.eu/energy/gas_electricity/electricity/doc/20131122-cacm.pdf*

The following products are traded in the European power exchanges:

i) day ahead/spot hourly electricity
ii) Intraday hourly electricity
iii) physical or financial futures on yearly, quarterly, monthly basis
iv) other products (eg. emission rights, green and white certificates, regulating power, natural gas, coal, etc.)

Although each exchange offers greatly different products, a recent process of diverging may be observed: power exchanges are forming two groups, the ones offering day-ahead and the ones trading with futures products. Day-ahead markets are predominantly run by TSOs, while the bigger futures markets have been acquired by financial investors in the past 5 years.

This is illustrated by the separation of Nordpool to day-ahead and futures markets. In 2007, NASDAQ OMX acquired futures markets of Nordpool, and the clearing house of Nordpool in 2010. However, day-ahead and intraday markets remained in the possession of Scandinavian TSOs. Another example is the formation of EPEXSPOT, jointly founded by the German EEX – owned by the Deutsche Börse – and the French Powernext, which offers day-ahead trades in France, Germany, Austria and Switzerland. German and UK futures were taken over by ICE (Intercontinental Exchange) in 2013 from

Market	Exchange	Owner	DAM	Intraday	Physical futures	Financial futures	Natural Gas	Other products
NL, UK	APX	**TSO**	X	X				
SI	BSP Southpool	**TSO/state**	X	X				
CH, DE/AT, FR	EPEXSPOT	**TSO/private**	X	X				
IT	GME	**state**	X	X	X		X	regulating power, white certificate, green certificate, emmission right
NO, SE, FI, DK, EE, LV, LT	Nordpoolspot	**TSO**	X	X				
ES, PT	OMIE	**state**	X	X				
RO	OPCOM	**TSO**	X	X			(X)	green certificate, emmission rights
CZ	OTE	**state**	X	X			X	regulating power
IE	SEMO	**TSO**	X	X				
PL	POLPX	**private / state**	X	X	X		X	emmission rights, cogeneration certificate
BE	Belpex	**TSO**	X	X				green certificate
AT	EXAA	**private**	X					green electricity
HU	HUPX	**TSO**	X		X		**CEEGEX**	
SK	OKTE	**TSO**	X					
RS	BSP Southpool	**TSO/state**	X					
DE/AT, FR	EEX	**private**			X	X	X	coal, emmission rights
BE, NL, UK	ICE ENDEX	**ICE**			X		X	emmission rights, gas storage access
UK	N2EX	**NASDAQ**				X		Nordpool spot, intraday
NO, SE, FI, DK, EE, LV, LT	Nordpool	**NASDAQ**			X	X		
ES, PT	OMIP	**state**			X	X		
FR	Powernext	**TSO**					X	White certificate
CZ, HU, SK	PXE	**private**			X	X		

Source: REKK data collection based on power exchange websites

Table 1 Characteristics of European power exchanges and products traded

APX-ENDEX, while day-ahead trading remained at the hands of the TSO-controlled APX.

Thus it can be concluded that futures markets are taken over by commodity exchanges, whereas day-ahead and intraday trading is conducted by the TSO-controlled exchanges. This phenomenon may have a twofold explanation: on the one hand, day-ahead markets perform an important role in system operation, but the functioning of these markets requires a close cooperation of TSO and exchange. In case of futures products, peculiar characteristics of electricity – like the constant balance of demand and supply and the difficulties in storage – are not so important. On the other hand, revenues to be realized by day-ahead trading greatly lag behind the revenue to be realized by future trades. This is indicated by the ration of EPEXSPOT day-ahead and EEX futures revenue shares: the revenue of the futures market – which is made up of membership fees and volumetric trading fees – is 3-4 times greater than the revenue of the day-ahead market.

Besides the two types of exchanges described above, it is not uncommon to encounter a third type of power exchange, on which apart from day-ahead and futures trading, other products of the national energy market are traded. It must be noted that these exchanges are often formed due to regulatory action. Examples of this type are the GME in Italy, where regulating power, green and white certificates and emission right can be purchased, the OTE in the Czech Republic, OPCOM in Romania and TGE in Poland.

Thus it can be concluded that exchanges may be categorised in three distinct groups based on the products traded, and these three groups are not competitors to one another. Moreover, exchanges similar to HUPX – owned by TSO, facilitating day-ahead trade – do operate an intraday market as well, but do not trade futures market. Possible competitors of the Hungarian power exchange are assumed to be the neighbouring exchanges, due to the close coupling of markets and geographical reasons, and the EEX which is a decisive player in the region.

Designation of the market operator

According to the draft regulation of the EU, NEMOs shall fulfil the criteria below:

a) have or contract adequate financial, IT and technical infrastructure for the operation of single day-ahead coupling
b) are cost-efficient with respect to day-ahead (or intra-day market coupling).
c) have appropriate independence from market participants
d) be able to provide the necessary clearing services.

In the following section assesses how HUPX fits these criteria.

Financial IT and technical infrastructure

Generally speaking all currently operating power exchanges do possess these infrastructures. The main difference between the exchanges is that if they own a front-end software or license it from another exchange. For instance, EPEXSPOT uses an own fron-end software and optimization algorithm, and licenses it to another exchanges, like HUPX and BSP Southpool. This way software usage fees are costs for the licensee exchanges and revenue for the ones providing the software.

Market operation and coupling in a cost-effective way

Costs of market operation are essentially determined by IT infrastructure costs and software licensing fees. Since these fees are rather fixed and not volumetric in nature, a raise in membership or trade volumes may in theory result in lower fees.

Exchange members pay a one-off entry, yearly fixed and volumetric fee. We have collected these fees for the regional exchanges. The left hand chart of Figure 16 displays the pattern that an increase in the number of exchange members results in a decrease in annual fixed fees. The reason for EEX being an outlier is that in the regional power markets it has such decisive role that it may ask for such high fees.

In case of volumetric fees we find counterintuitive results: greater trades are coupled with higher volumetric fees. A possible explanation of this phenomenon is that day-ahead markets are not competitive yet, and exhibit a rather monopolistic market structure. Therefore the exchanges can levy higher fees for higher trade volumes.

It should also be noted that the different exchanges utilise various pricing strategies: some apply high fixed fees coupled with low volumetric fees, others use low fix and high volumetric combination. For example HUPX charges higher fixed fees compared to OTE and EXAA, but applies lower volumetric fees relative to these exchanges.

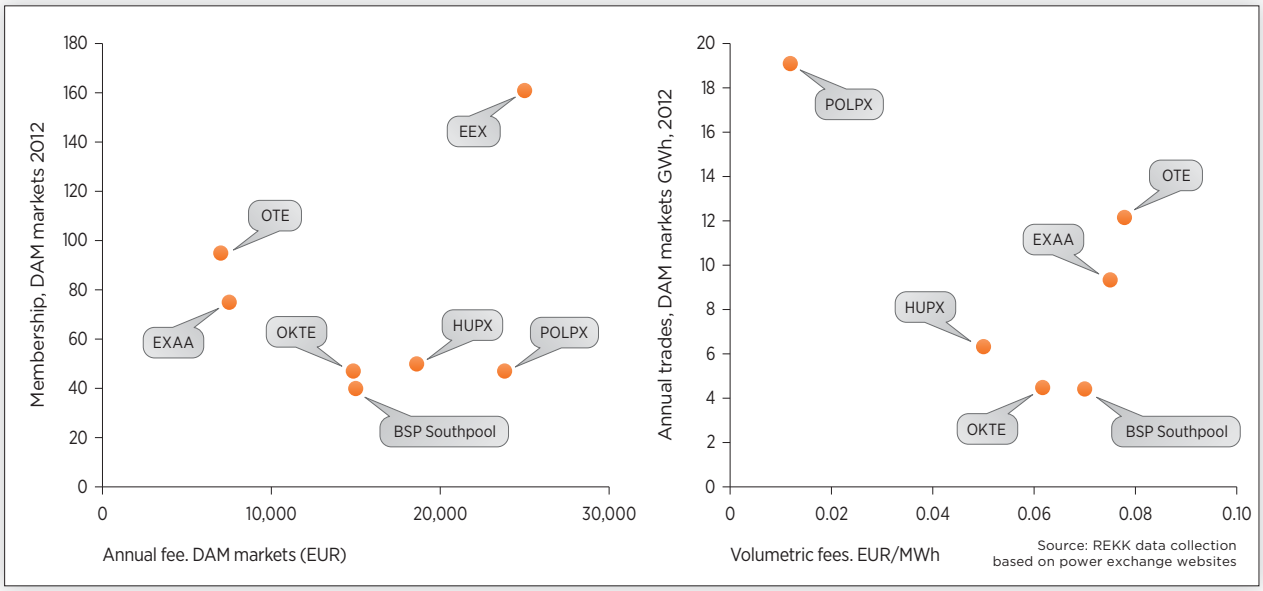


Figure 16 Fixed and volumetric fees on regional day-ahead markets

Maturity and integration of the power exchange to the national energy market is displayed best by the share of day-ahead trade in annual electricity consumption. As Figure 17 shows, in the regional markets this index is around 20%, but in more mature markets – like day-ahead EEX or Nordpoolspot – this share may approach even half or three quarter of annual consumption. So further development of the regional markets is a possibility.

Operation of a local exchange may be also reasoned with the fact that traded volumes of Hungarian futures sold on EEX since 2009 were completely diminished in 2011 and 2012 by HUPX, as Figure 18 shows. In 2013, HUPX still had bigger trade volumes but PXE realized more trades again. Since we could not find real difference between the price of the futures traded on these two exchanges – in the last 2 years price difference remained below 0.5 Euros, sometimes in favour of HUPX other times in favour of PXE) it can be concluded that the two exchanges compete in fees.

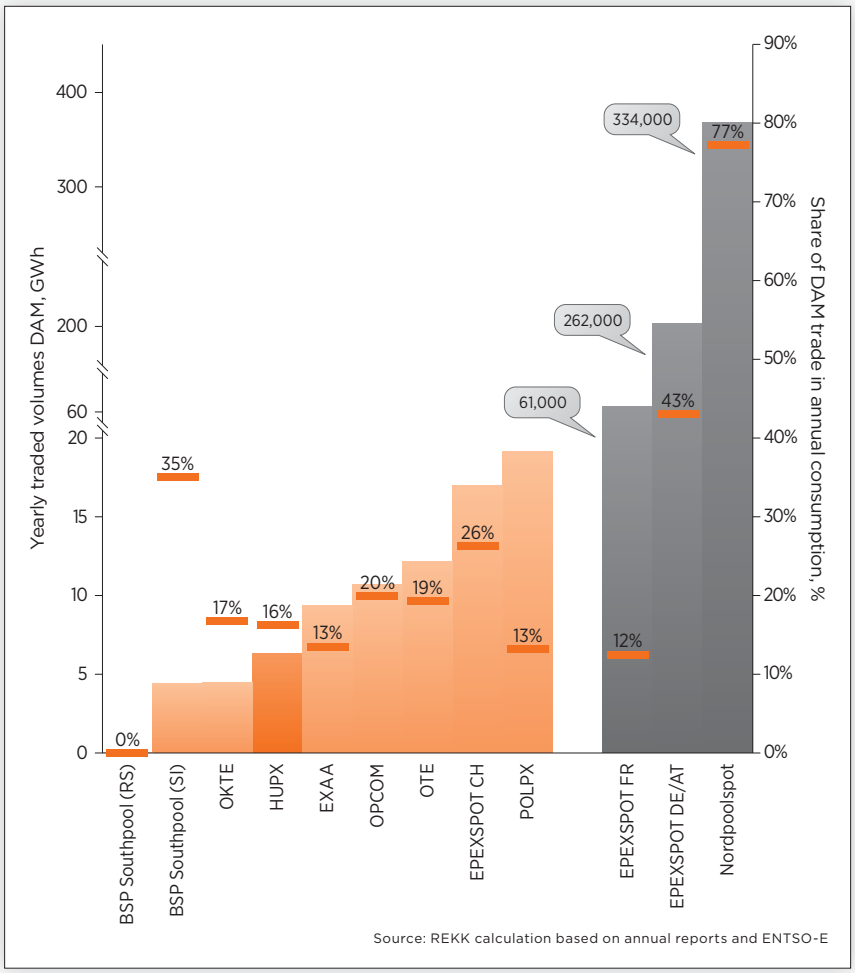


Figure 17 Annual trade voilumes in regional DAM markets and their share in 2012 consumption

Independence from market participants

This criteria is fulfilled by all exchanges, none of the exchanges is controlled directly by market partici-pants. In the region organised electricity markets are mainly in the ownership of TSO-s: in Romania, Slovenia and Hungary. In the Czech

Republic, the state exercises its ownership rights via one of its ministries. Majority owner of the Polish power exchange is the Warsaw Stock Exchange, but the minority owner Polish State Treasury has a voting majority. The EXAA is controlled by commercial banks, EEX owned by the Deutsche Börse.

Clearing house services

In all cases, financial clearing of transactions between traders is performed by a clearing house. Among the numerous clearing houses we must point out ECC (European Commodity Clearing), which is owned by the EEX group. ECC ensures the clearing of HUPX, PXE, EPEXSPOT and EEX. ECC differentiates in the volumetric clearing prices: clearing of EEX baseload futures costs 0.5 Eurocents/MWh, while the clearing of Czech baseload futures costs 1 Eurocent/MWh. For comparison: volumetric fees in the exchanges are around 5-10 Eurocents/MWh, so clearing fees are not negligible. Thus exchanges being supplied by the clearing house of another exchange may easily find themselves in disadvantage, if the two exchanges offer the same products.

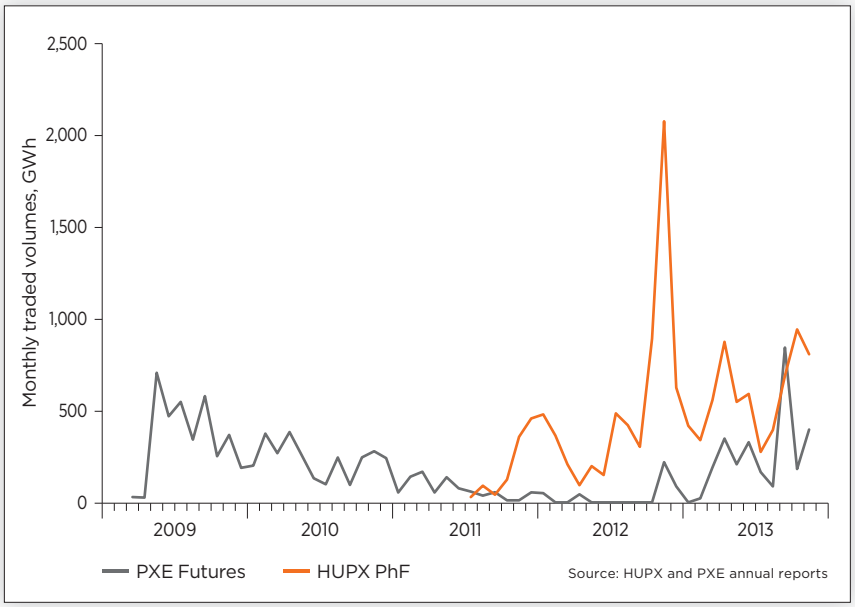


Figure 18 **Volumes trade din HUPX PhF and PXE Hungarian futures**

It can be seen that the situation of HUPX is stable in the region: it has ample opportunities to expand in the Hungarian market and realised greater volumes in Hungarian future trades than PXE. However, it has a competitive disadvantage, since it licenses its software for market operation and uses a clearing house owned by another exchange. Should the exchange supplying HUPX aspire to operate the Hungarian market on its own, position of HUPX may not be regarded as stable as we see it now.

WORKING PAPERS

Modelling residential and tertiary sector energy consumption

Energy efficiency plays an important role both in EU and national energy policies. According to paragraph 7 of the 2012/27/EU Directive every member state should save 1.5% of its total annual final energy consumption between 1 January 2014 and 31 December 2020. In recent years a significant drop can be observed in residential and tertiary sector primary energy consumption. Is this decrease related to new energy efficiency investments and the spread of newly built dwellings, or it is related to the economic crisis, or are there other reasons in the background? What should be expected in residential and tertiary energy consumption in the coming decades? In the following, we will examine these questions. First we will introduce the most influential trends that have an effect on the energy consumption of the two examined sectors, and then we will provide a forecast of residential and communal primary energy consumption, based on the REKK-developed building energy performance model. Lastly, we will provide a comparison of the current forecast with the trends proposed in the National Energy Strategy.

Primary energy consumption

The primary energy consumption of the residential and tertiary sectors, which have a 35-40% share in the total primary energy consumption and play an important role through the building energy technology programmes, showed a significant fluctuation during the last decade. While between 2000 and 2005 we can observe an increasing trend in energy consumption (from 360 PJ to 420 PJ), within the year between 2006 and 2007 the energy consumption of the two examined sectors experienced a 10% decrease. Since then the energy consumption fluctuates at a lower level. The fluctuation is generally influenced by the average mean temperature of the given year; however these changes cannot be fully explained by the different heating degree day values.

Following a detailed analysis, we identified a factor that – in addition to the climate – could provide a sufficient explanation to the changes in the primary energy consumption in the residential and tertiary sectors. This factor is the trend of the money spent on household energy per person (total consumed energy excluding energy spent on transportation). While in 2000 the spending per person on 2000 real prices was 45 thousand Forints, this cost was 73 thousand Forints in 2011, based on the same real prices. The largest increase during this period occurred between 2007 and 2008, which can be explained by the significant increase in the costs of heating material, and particularly the price of natural gas.

If these two factors, the heating degree day value and the costs of domestic energy consumption per person, to describe residential and tertiary sector energy consumption, then we acquire a model that explains primary energy consumption trends with a 96% probability. Based on the linear regressive model, a ten percent decrease/increase in domestic energy expenses leads to an 8.0 PJ growth/cut in primary energy consumption, while a year with more/less heating degree days than a hundred increases/decreases primary energy consumption by 8.2 PJ.

Natural gas consumption

Until recently, natural gas consumption in the residential and tertiary sectors could be very well described by taking into account three factors: the number of households connected to the natural gas network, the changes in the real price of natural gas, and the heating degree day value. We applied linear regression to data from the period between 1995 and 2012, where the explanatory variables were the above-mentioned three factors. The explanatory power of the model is very high, over 93%. The model functions very well for the period between 2000 and 2009, but in the last three years we note a difference in trends: natural gas consumption estimated by linear regression exceeds the level of actual consumption by 10-20 PJ. To find the reasons, we examine the types of primary energy consumption in the domestic and tertiary sectors in Figure 19.

It is clear that renewable and other (mostly coal) fuel consumption significantly increased between 2008 and 2011. The growth in this period exceeds 15 PJ, which roughly corresponds to the 10-20 PJ that is “missing” in natural gas consumption. Therefore, we conclude that the decrease in domestic and tertiary sector natural

gas consumption in recent years is mostly due to fuel switch, that is, we use wood and coal instead of natural gas; however, the total primary energy consumption has not changed significantly in recent years.

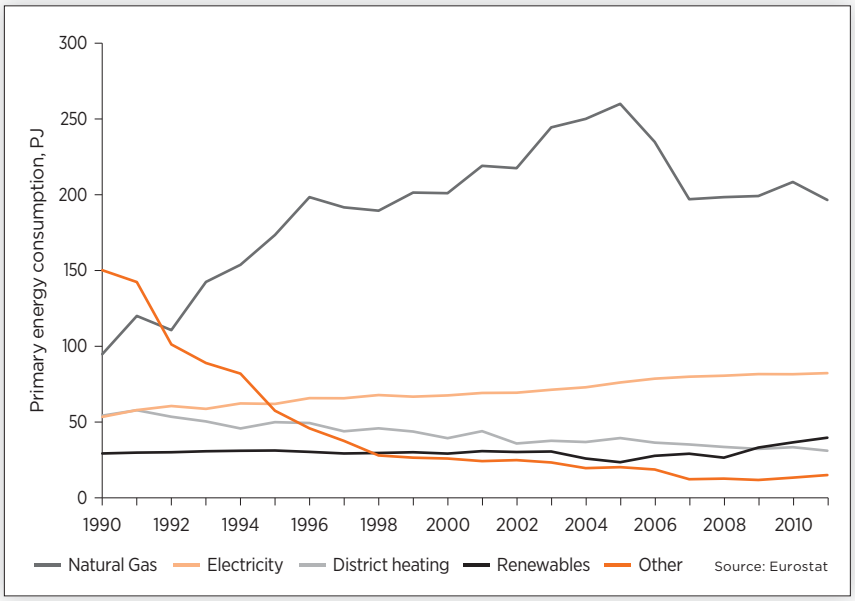


Figure 19 Sources of primary energy consumption in the domestic and tertiary sectors, 1990-2011, PJ

The energy efficiency investment trends of the residential sector

The residential and communal energy efficiency investments can be divided into two segments: private investments and investments that are realised through state-funded support schemes. In the following, we will describe the trends of these two funding types.

There is no available information on energy efficiency investments in the tertiary sector. In case of residential investments, the Central Statistical Office (KSH) annually publishes the average dwelling investment costs per person. At the same time, this data not only reflects the energy efficiency investment costs, but also incorporates all other housing related investments, not including investments in newly built property. The amount spent on new building is excluded in this case. Still, this data can be a relatively good indicator in estimating energy efficiency investments.

In real terms, investments in dwellings had been growing steadily between 2000 and 2007, since then it has been stagnating. The total of such annual household spending is slightly above 300 billion Forints. According to our estimates, assuming that in the given period half of the above spending was aimed at energy efficiency (construction installation, isolation, and replacement of closing systems) then it is possible to refurbish about 2-4% of the total existing housing portfolio, meaning annual energy saving of 2-5 PJ.

The other source of building energy performance investments are state-funded support schemes. After 2001, 76 billion Forints were approved from a total of 11 state funded building energy performance support schemes, while the overall investment costs reached 226 billion Forints, including both state and private sources. According to estimates, investments (including from personal resources) partly supported by the state result in a 2 PJ energy saving. The support schemes affected 400 thousand flats, which is approximately 10% of total number of flats in Hungary. 91% of the state-funded financial support went to flats in prefabricated concrete slab buildings. Figure 20 displays the amount of state support between 2001 and 2012. It is clear that between 2001 and 2009 state approved support budget was increasing, while from 2010 to 2012 it remained at 4 billion Forints.

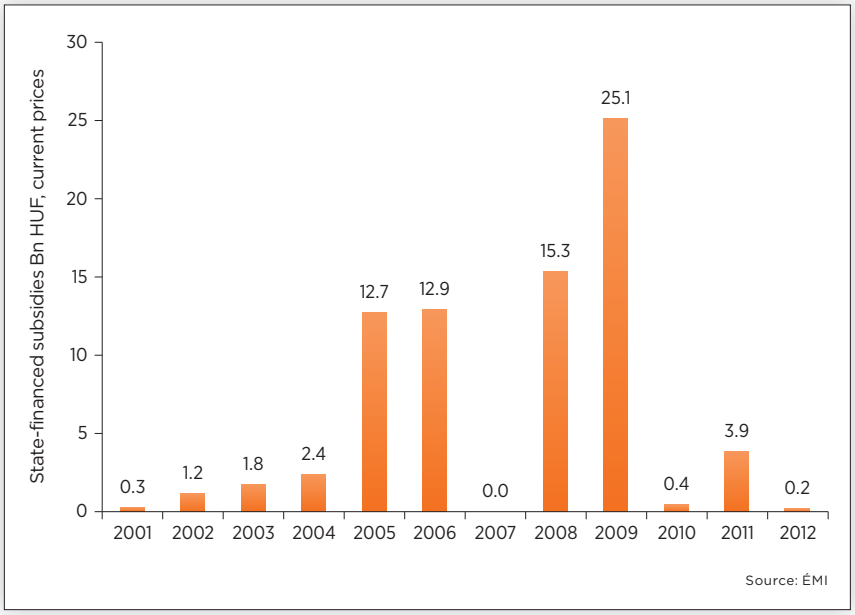


Figure 20 State-financed subsidies for residential building energy performance upgrade, billion HUF, current prices

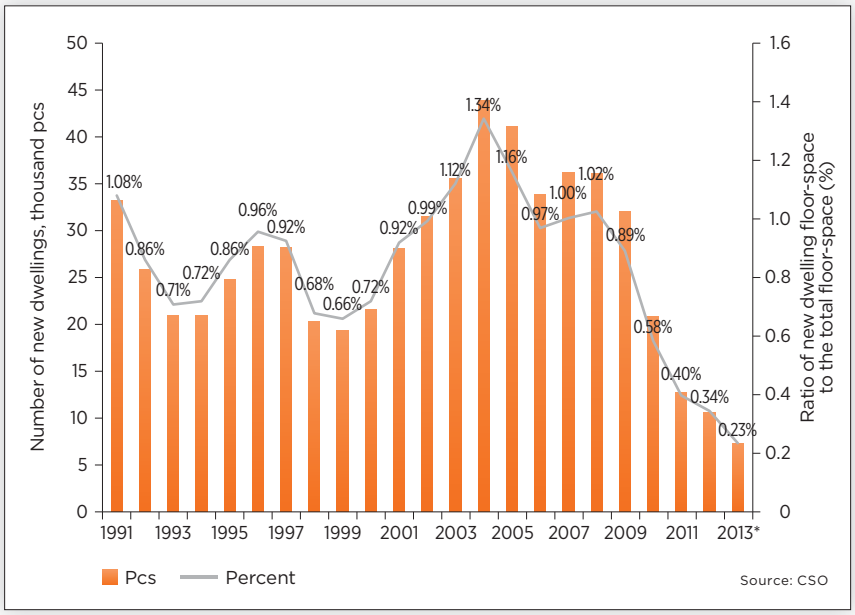


Figure 21 **The number and ratio of newly built flats, 1991-2013**

** for 2013, the annual data was estimated based on the first three quarters.*

Trends for new dwellings

The trends in the number of new dwellings can have a significant impact on primary energy consumption, as a newly built property's specific primary energy consumption can be 30-60% lower than that of an average flat. As the newly built properties can partly replace older flats (which can be demounted or stay unoccupied), primary energy savings can increase.

Since 2003, the ratio of newly built properties is constantly decreasing. While in 2003 the number of newly built properties was above 40 thousand, in 2013 this number is expected to fall under 8 thousand, which is a mere 0.23% of the total floor space of occupied flats. This means that the full property portfolio would be replaced in 400 years. In 2013, there is still no sign of any changes in this trend. Data from Q3 of 2013 show a rather pessimistic picture as well.

Changes in dwelling space per person

One of the main factors in determining primary energy consumption is the size of living space per person. This factor often tends to be neglected; however, even though there are noticeable new trends showing not only in Hungary, but also in Europe. While the living space per person in Hungary was 27.2 sq. meters in the early 1990s, this increased to 33 sq. meters by 2011, despite a decreasing population. At the same time, this value is 43 sq. meters in Germany, and 44 sq. meters in Austria.

In the past 20 years, we experienced an average of 1% annual increase in living space per person, which is not an insignificant number. It is worth comparing this data to the number of privately refurbished dwellings, which, according to our estimates, is roughly 2-4%.

Modelling the primary energy consumption in the residential and tertiary sectors

Previously we introduced the variety of factors that influence the trends of primary energy consumption in the residential and tertiary sectors. We then discussed the most important factors, which highlight the following trends:

- The primary energy consumption of the residential and tertiary sectors have not decreased in recent years
- The ratio of natural gas consumption is decreasing and this is being replaced with biomass and coal heating
- Private and state financed investment in energy efficiency is decreasing in the residential sector
- The number of newly built dwellings reached a historic low and there are no signs of changes in this trend
- The population is constantly decreasing
- The living space per person is constantly increasing

The best method for estimating the primary energy consumption in the next fifteen years is modelling the building portfolio, which captures the effects of these varied factors.

For the estimation of residential and tertiary sector primary energy consumption we used REKK's building model, developed for the National Strategy for Energy Performance of Buildings. The model, which simulates the energy consumption of the residential and tertiary sectors, provides an opportunity to change various input data and it is also efficient in depicting the energy consumption influence of distinct state-funded support schemes.

The method for modelling the residential building portfolio is as follows:

1. Determining the current building portfolio: based on the year of construction, masonry, features, and scale of refurbishment we created a total of 45 categories. For each category we determined the value of effective primary energy consumption.

2. Determining the trends of new dwellings.
3. Demand for buildings, that is, prospective estimation of the living space per person.
4. The resultant of the above-mentioned factors is the number of disappearing flats.
5. Then we determine how many and what type of dwellings will be refurbished. Furthermore, we calculate the total cost of refurbishment.
6. Based on the data of current dwellings, new dwellings, the liquidated dwellings, the living space per person and the assumptions for refurbishment allows us to estimate the prospective building portfolio.
7. With the prospective building portfolio and the primary energy consumption factors relating to the individual building types we can estimate a total domestic primary energy consumption.

Modelling the public building portfolio is based on the same principles as that of the domestic sector. Depending on the building functions, we determined five categories (education, cultural, health service, office, and trading), and within each category we identified various typical building types, totalling at 42. In the case of the public buildings, we assumed that in the five categories the living space needs are determined by the population numbers and the GDP growth.

Figure 22 shows the changes, based on the modelling, in residential and tertiary sector heating related primary energy consumption until 2030, if we do not include any refurbishment (that is, even excluding the continuation of privately financed energy efficiency investments observed in the past), and also showing what happens if we calculate with the investment values observed in the past, based on which 3% of the flats are refurbished in a year. Additionally, on Figure 22 we showed the Energy Strategy's energy consumption trends of BAU, Reference and Policy scenarios.

Figure 22 demonstrates that the currently forecasted BAU (no refurbishment at all), and

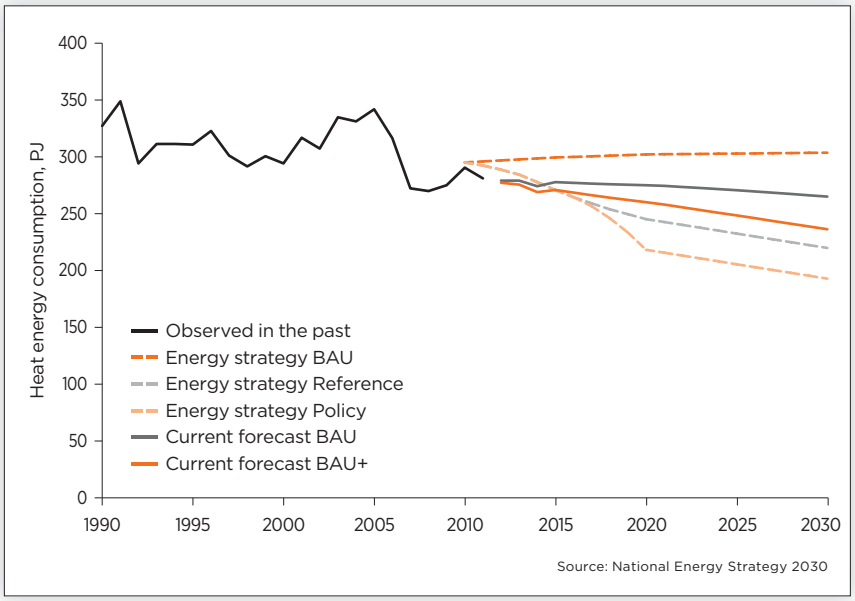


Figure 22 Trends in residential and tertiary sector heat consumption, 1990-2030, PJ

BAU+ (including private investments in the past) scenario's energy consumption is significantly lower than estimated by the National Energy Strategy. While the Energy Strategy put the BAU energy consumption above 300 PJ in 2030, in which case there are no energy efficiency schemes, the current forecasts predict a value between265 PJ and 236 PJ. The latter is closer to the Energy Strategy's reference scenario, being lower by only 25 PJ. While the Energy Strategy's reference scenario calculates with an energy saving of 84 PJ, due to building refurbishments, in the case of the policy scenario the assumption is an even stronger support from state policies.

It is clear that, due to the lower-than-expected economic growth and the changes in other factors, the energy consumption in the two sectors can decrease even without significant energy efficiency investments, and in terms of absolute values we are approaching the target values of the National Energy Strategy.

Peculiar sectoral taxes

In one of our previous issues[1] we analysed the effects the first 10% decrease of the domestic energy expenses had on the electricity and natural gas markets and we briefly discussed the surtaxes introduced in this sector. In this article we are going to fully discuss the details of these taxes and briefly compare this with other European examples. One of our reasons for this discussion

[1] Storm in the household overhead: Rekk analysis on decreasing the household overhead expenses in January 2013, Energy Market Report, 2013. Issue 1.

is that our estimation shows that the expected income from this tax in the state budget will constitute 29% of the total corporate income tax revenue, which shows that the proportion of the direct tax income expected from this sector has not decreased significantly, despite the removal of surtaxes.

In the following, we will discuss four taxes. We scrutinize in detail the so-called "Robin Hood" tax, which was enacted in 2009 and was significantly modified at the beginning of 2013. We mention the now redundant sectorial surtax; the Utility Lines and Pipes taxes introduced in January 2013 as a new type of taxing; and we also feature the 2013 modification to the local business tax, which, in our point of view, significantly affects the energy segment or at least its trading segment.

In some cases, the energy tax is also mentioned as surtax.[2] However, we do not include this as such, because its introduction in 2004 was connected to the European Council Directive 2003/96/EC that reorganised the energy products and electricity taxing framework of the community with the aim of incentivising more efficient energy consumption, in line with EU targets and the Kyoto Protocol. The Directive sets the minimum levels for energy product taxes, electricity as fuel, fuel and heating materials in a manner that does not burden household expenses. The current level of the energy tax in Hungary is close to the minimum set by the EU, therefore the lawmakers cannot be accused of only introducing this tax to increase the government budget.

The income tax of the energy suppliers

The first energy sector specific surtax was the income tax levied on the energy suppliers–colloquially referenced as district heating or Robin Hood tax – came into force on 1 January 2009. The tax targeted a defined group of energy companies, those defined in the legislation as energy supplying business entities, with an income tax of 8% in addition to the corporate income tax. Despite the original plans of the lawmakers, the tax was not abolished after two years of its enactment, and from 1st January 2013 the taxed group was expanded and the tax rate was increased to 31%.

Where does "Robin Hood" come from?

The introduction of a surtax was first discussed in 2008 as fuel and food prices were rapidly rising across Europe; the idea, commonly referred as "Robin Hood" tax, was to compensate low-income population sections by decreasing the extra profits gained by oil companies. In June 2008, Jose Manuel Barroso, President of the European Commission announced that the Commission would not hold back members states from introducing taxes on the extra profits of energy companies, taxes referred to in the media as "Robin Hood" tax, or from cutting the excise tax on certain products if used to mitigate the effects of higher oil prices.[3]

In Hungary, the law proposal was submitted in the autumn of 2008 with a reference to covering the expenses of district heating compensations, that is, according to the final text of the legislation the income from this tax would fund residential energy efficiency improvements, and contribute to residential natural gas and district heating subsidies.[4]

The act was essentially rewritten by the introduction of the amendments that entered into force on 1 January 2013. The tax rate increased by 387.5%, and the number of taxpayers subject to this levy was increased with those universal service providers, whose profitability was significantly and adversely affected by the current domestic energy expense reduction. Recalling the results of our earlier analysis on the effects of the initial reduction of domestic energy expenses by 10%: due to the decrease in network usage charges in the electricity sector, the annual burden for distribution network operators, will likely increase by 5.1 billion HUF in 2013; the income of universal service providers decreases by 7.4 billion HUF; and in the natural gas sector the expenses of distribution network operators affected by the expansion of the taxpayer category have increased by 2.9 to 3.2 billion HUF. The 11.1% decrease in pricing, effective from 1 November 2013, will likely further hinder the profitability of these companies.

As figure 23 shows, on the planned and actual tax incomes from the different tax categories

[2] The role of surtaxes in taxing systems 2nd July 2013. LeitnerLeitner

[3] In June 2008 at the meeting of the Heads of States and Heads of Governments, the Commission was asked to examine the possible measures aimed at stopping the increasing prices.

[4] Para. 3. the state budget offers a differentiated support, taking into account the residents level of revenues, for residential district heating consumers – until the universal realisation of district heating consumption control and measurment, in order to decrease disadvantages in terms of district heating competetiveness – and for residential natural gas network consumers, defined by Act LXVII of 2008 on the Increase of Competitiveness of District Heating.

The legislative act in brief details:

Legislative act: Act LXVII of 2008 on boosting the competitiveness of district heating services

Dates of effect: 1 January 2009.

Taxpayer: the energy supplier, public service provider, including foreign entrepreneurs, who are active in this segment in Hungary, are obliged to pay taxes on their business conducted at its registered head office in Hungary.

The definition of energy supplier in this act:

From 1 January 2009 to 31 December 2012.

1. hydrocarbon producer,
2. oil product producers, oil wholesale and retail traders (those that fall into the excise tax category),
3. natural gas trading permit holders, as defined in the act on natural gas supply,,
4. electric energy trading and production permit holders, as defined in the act on electricity; , with the addition that only those producers from the obligatory feed-in category are included whose built-in production unit is above 50 MW capacity;

Since 1 January 2013, in addition to the above

1. those universal service providers and distribution network operators that are defined in the act on electricity, according to the act on natural gas supply, those universal service providers, distribution network operators and the service providers segments not discussed in this article–,
2. those public hydro services providers defined in the act on public water distribution network services,
3. those water management service providers where the activity is collecting sewage water via means other than through pipelines, as defined in the act on water management,
4. Public waste management service providers as defined in the act on waste.

Base sum of taxation: essentially the same as for corporate income tax, with more restricted modifying items.

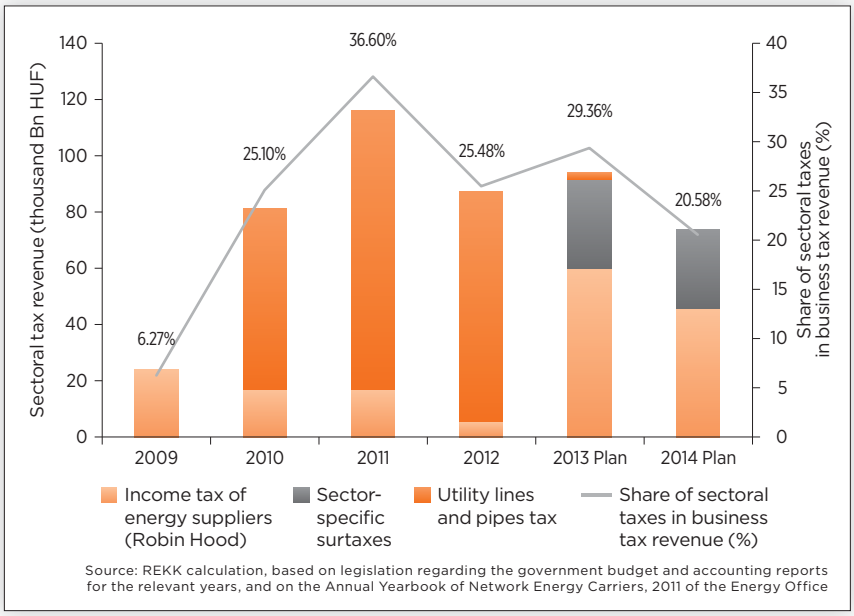
Tax rate: 8% from 1 January 2009, 31% from 1 January 2013.

Tax benefit: from 1 January 2013 an improvement/development tax benefit can be claimed up to 50% of the total tax payable, and up to the allowed limits not yet claimed for corporate income tax.

Declaration within the income statement: The Robin Hood tax cannot be written off as part of the expenditures, it decreases the revenues once taxes have been deduced, similarly to the corporate income tax.

Taxing schedule: The taxpayer with income over 50 million HUF must declare and pay 90% of the expected income tax by 20 December of the current accounting year. The payable income tax, similarly to the corporate income tax, must be stated, declared, and paid by 31 May after the reference year; and tax refund can also be claimed from date onwards. From 2014, the tax is to be paid by the same timetable as the corporate tax, which means an even distribution of the financial burden over the calendar year.

between 2009 and 2014, from 2011 to 2012 the revenues generated from the Robin Hood tax significantly decreased: although the 2012 Act of Budget only expected 70% of the previous year's income, the actual income was eventually only 33% of the income from the previous year. The legislative act was not amended during this period; therefore the tax revenue decrease must be explained by other causes: redefinition of taxpayer category, the tax base used possibly lowered due to outsourcing of activities to foreign bases or due to a drastic decrease in the tax base (that is, the income before taxes). The confines of our article does not allow for an examination of the reasons for the decrease in tax base, but the reality of this decrease and the inclusion of those tax payers who are already affected by the domestic energy expenses reduction questions the practicality of the expected revenue incomes for 2013.



Source: REKK calculation, based on legislation regarding the government budget and accounting reports for the relevant years, and on the Annual Yearbook of Network Energy Carriers, 2011 of the Energy Office

Figure 23 Taxes levied on the energy sector that benefit the government budget (million HUF)

Sector-specific surtaxes

Following the introduction of the Robin Hood tax at the end of 2010 further sector-specific taxes were introduced that, in addition to the energy sector, also targeted the communications and retailer sectors. The submission of the proposal was justified by referencing the necessity to balance the government budget and the load-bearing capacity of the affected sectors. At the time of submission of the bill on "On Special Taxes on Certain Sectors", the Budgetary Council expected a total revenue of 188,000 million HUF from the energy sector for years of 2010 to 2012, however, in reality the revenue was 244,786 million HUF.

The details of the legislative act

Legislative act: Act XCIV of 2010 on Special Taxes on Certain Sectors

Dates of effect: 18 December 2010 to 31 December 2012

Taxpayer: those legal entities that are defined by Act LXVII of 2008 (the district heating act) as energy suppliers, with the definition pre-dating 1 January 2013

Tax base: the tax payer's net revenue from its energy supply activities

Tax rate: 1.05%

Declaration within the income statement: the sectoral surtax was defined as miscellaneous expense.

Utility lines and pipes tax

The utility lines and pipes tax[5] was introduced on 1 January 2013 with the aim of achieving a more balanced share of public costs, and increasing revenues by defining public utility pipes as taxable assets.[6]

The government budget expects a revenue of 60 billion HUF from the new tax in 2013, where the natural gas and electricity sector can expect to pay 37,100 million HUF based on the data collected by the Hungarian Energy and Public Utility Regulatory Authority on pipe and cable assets.[7] In comparison to 2013, the government budget act for 2014 expects these revenues to decrease by 20%, but it is not entirely clear why this revenue would decline: due to the tax limit being lowered, the category of taxpayers being tightened, or the definition of public pipes and cables being amended.

The details of the legislative act

Legislative act: Act CLXVIII of 2012 on Tax Imposed on Utility Lines and Pipes

Effective from: 1 January 2013

The object of taxation: public utility lines and pipes

Taxpayer: the owner of the public lines or pipes as registered on 1 January in the current year, and the public utility operator in the case of state ownership

Tax base: the length of public utility lines or pipes in meters (parallel-laid lines or pipes on the same route are counted only once.)

Current tax rate: 125 HUF/meter

Taxing schedule: the tax declaration must be submitted by 20 March, the tax must be paid by 20 March and by 20 September in two equal instalments.

The definition of utility lines and pipes: supplies consumers with water, natural gas, district heating and electricity, or disposes of sewage water and drainage; network cables located on public space, above or below its surface that satisfy temporary and permanent telecommunication needs; including property other than public space, above or below its surface, excluding those network sections that, in order to satisfy consumer needs, are directly connected to a lot numbered property.

Operator: the person or organisation responsible or the public utility pipe or cable

Declaration within the income statement: as miscellaneous expense

Taxing schedule: the declaration must be submitted by 20 March, the tax must be paid by 20 March and by 20 September in two equal instalments.

From 1 January 2014, the revenues authority is planning to calculate the real value of public cable and pipe tax by using an electronic registry of the public utility infrastructures with standardised monitoring in place for all five public utility branches. This database will not be a unified system, but instead the existing database sections will be managed through a single platform. The routes of the five public utility – water, natural gas, district heating, electricity, and telecommunications – and the respective owners, operators, and their contact details will be featured on the land administration maps.[8][9]

Local business tax

The last tax type in our paper is a somewhat out of context: this is not a sector-specific tax, furthermore, this is not a revenue going into the

[5] Act CLXVIII of 2012 on Tax Imposed on Utility Lines and Pipes
[6] General justification for the Tax Imposed on Utility Lines and Pipes *http://www.parlament.hu/irom39/09166/09166.pdf*
[7] Annual Yearbook of Network Energy Carriers, 2011 (HEO) *http://www.eh.gov.hu/gcpdocs/53/VEZESTEK%202011.pdf*
[8] Governmental Decree 324/2013 (29 August) on the integrated electronic public utility registry
[9] *https://www.e-epites.hu/hirek/2014-januar-1-jen-indul-az-e-kozmu-tajekoztato-rendszer*

The details of the legislative act

Legislative act: Act C of 1990 on Local Taxes

Effective from: 1 January 1991

Tax obligation: those temporary and permanent business activities that take place on local council land.

Tax payer: entrepreneurs with headquarters or field offices on local council land.

Tax base calculation until 31 December 2012 = net revenues – (CoGS [10] + value of delivered services + subcontractor delivery + cost of raw material + the direct cost of preliminary research, applied research, experimental development).

From 1 January 2013 the ratio of the proportion of CoGS and the value of delivered services that can both be taken into account as deductions is dependent on the level of revenues and calculated as follows:

Net sales revenue	values of CoGS and delivered services, taken into account as deductions
up to and including 500 million HUF	the entire sum in this band
over 500 million HUF and up to and including 20 billion HUF	85% of the sum in this band
over 20 billion HUF and up to and including 80 billion HUF	75% of the sum in this band
over 80 billion HUF	70% of the sum in this band

The tax base must be proportionately divided between the headquarters and the field offices defined in this law.

Current tax rate: the local council decides on the introduction of this tax, its maximum rate is 2%

Declaration within the income statement: as miscellaneous expenses.

government budget, however, we believe that, as some of the suppliers in the discussed sectors are affected by this tax, it is appropriate to mention the recent changes (effective from 1 January 2013) made to the local business tax.

For some energy sector entities, the law defines field offices differently, and prescribes a distinct tax base division method. It is our contention that these distinct versions of the general regulation are not disadvantageous for the companies, but in the case of these companies these distinct regulations better serve the taxing aim set out in the legislation.

However, the limitations introduced in January 2013 on tax base decreases have a considerable impact on the universal service providers and traders, as the CoGS and the value of delivered

Net revenue from sales	**253 005**
Raw material costs	4 007
Value of contracted services	9 122
Value of miscellaneous services	466
Cost of goods sold	244 036
Cost of services sold (delivered)	41

Calculation: REKK

Table 2 The annual data of the gas supplier for 2012 (mn HUF)

services are significant items among their costs and due to the nature of the business they are not able to modify the proportions of these items: they sell natural gas or electricity purchased from power plants or wholesale traders – which will show up in their accounts as CoGS – with the help of distribution companies (delivered services). This effect is further aggravated by Decree 78/2012 of the Ministry of National Development, [11] which not only maximised the prices chargeable by the universal service providers as defined by the Act on Electricity, but also defined a universal profit margin for them. The defined universal profit margin limits the tax payer's options when calculating with the new local business tax: the tax payer is unable to compensate for the income loss caused by the increased business tax by raising its sales revenues.

We demonstrate below how this change in the local business tax calculation methodology affects gas suppliers, based on company data from 2012.

The tax base based on the calculation of the local business tax base applicable to 2012 is 4.921 million HUF, therefore the value of the local business tax is 98 million HUF.[12] Since due to the regulation effective from 2013 the revenues can only be decreased in line with the segmented scale discussed above, instead of decreasing by the total of the CoGS and the costs of delivered services, the tax base increases to 72.069 million HUF, and the tax payment – with a 2% tax rate – increases to 1.441 million HUF.

The amendment of justifiable cost regulation

In our article we have discussed in details the surtaxes that significantly affect the sector. However, besides these surtaxes additional

[10] Cost of Goods Sold
[11] Decree of the Minister of National Development No. 78/2012 (22 December 2012) on the amendment of certain ministerial decrees on the price regulation of energy products
[12] Tax base is: 253.005- (4.007-9.122-466-244.036-41)= - 4.667 million HUF; tax: 0 HUF

measures have been enacted. Act XII of 2013 permit holders of denied electricity and natural gas suppliers defined by the law the ability of passing on the Robin Hood and Utility Lines and Pipes taxes in any form. This way the lawmaker directly limited the sector's market-based functioning: in previous regulations it was accepted to revise costs and acknowledge these costs that could not be influenced by market actors, and to incorporate these into the revised price.

Other European examples

At the end of our article we provide a brief outlook on the characteristics of energy sector specific surtaxes in other EU countries.

The introduction of surtaxes is not a uniquely Hungarian phenomenon. As a crises management tool, many other countries introduced similar surtaxes; however, generally speaking these taxes do not match in size and scale to the taxes introduced in Hungary. In many EU countries "energy taxes" were introduced on the basis of the Commission's Directive 2003/96/EC, however, these do not fall into the category of surtaxes we have discussed here. The majority of these taxes are aimed at providing incentives for reducing environmental pollution – CO_2 emission reduction, increasing energy efficiency – for example, by introducing excise taxes on fuel – or, in the case of Portugal, on electricity and natural gas – or by introducing carbon tax (France, United Kingdom). Another category is nuclear tax (for example, in Belgium, Germany and Sweden), however, these are mostly not newly introduced taxes, and while the tax rates may have been raised, this can be explained by environmental and fiscal reasons. A third category, typical to Spanish and Scandinavian regions, is the "natural resource usage tax" – appearing with different labels, but applied with similar principles: wind- (Spain) and hydro-power plants (Sweden, Norway) are affected, partly with newly introduced taxes, and partly with a recent increase in the level of taxes.

The introduction of surtaxes similar to the Hungarian ones can be found in Italian and Spanish governmental decrees. The former is a "Robin Hood type" tax: the revenues of carbon miners , refineries, electricity distributors and producers are taxed by an additional 10.5% if their sales revenue exceeds 10 million EUR and if their tax deductible earnings exceed 1 million EUR. Furthermore, a network tax was introduced in Spain: based on the network length, the electricity distribution network owner or its operator must pay a tax of 1.58-4.94 EUR per meter.[13] It is worth mentioning the Czech surtax and a Slovak tax proposal; both of which are or would be levied on solar-produced electricity. The former was introduced two years ago, and the taxpayers are the solar electricity producer companies, while the later is currently still just a proposal. However, the outrage of the producers in both countries is equally visible.

[13] Eurelectric: Fiscal Flash Electricity 2012: Developments in Tax Policies Relevant to the European Electricity industry in 2013

Abbreviations in the Report:

APX	Amsterdam Power Exchange
ARA	Amsterdam–Rotterdam–Antwerpen
CEGH	Central European Gas Hub
CCS	Carbon Capture and Storage
EEX	European Energy Exchange
HAG	Hungary–Austria Gasline
HDD	Heating Degree Day
HUPX	Hungarian Power Exchange
MEKH	Hungarian Energy and Public Utility Regulatory Authority
NEMO	Nominated Electricity Market Operator
OPCOM	Operatorul Pietei de Energie Electrica
OTE	Operátor trhu s elektřinou
PXE	Power Exchange Central Europe
SEPS	Slovenská elektrizačná prenosová sústava

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Hungarian Energy Market Report has finished its fifth year. Thanks to our Subscribers, numerous interesting analyses were published in the past five years, this is why we thought it would be useful to create a table of contents for all the articles published in our –Report so far.

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The aim of the Regional Centre for Energy Policy Research (REKK) is to provide professional analysis and advice on networked energy markets that are both commercially and environmentally sustainable. We have performed comprehensive research, consulting and teaching activities on the fields of electricity, gas and carbon-dioxide markets since 2004.Our analyses range from the impact assessments of regulatory measures to the preparation of individual companies' investment decisions.

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Geographically, our key research area is the Central Eastern European and South East European region:

- regional electricity and gas price modelling
- CO_2 allowance allocation and trade
- supports for and markets of renewable energy sources
- security of supply
- market entry and trade barriers
- supplier switching

Consultancy services

- price forecasts and country studies for the preparation of investment decisions
- consultancy service for large customers on shaping their energy strategy on the liberalised market
- consultancy service for regulatory authorities and energy supply companies on price regulation
- consultancy service for system operators on how to manage the new challanges

Trainings

Our training programmes:

- summer schools
- courses for regulators
- trainings and e-learning courses in the following topics:
  - price regulation
  - electricity markets
  - market monitoring
  - gas markets
- occasional trainings for companies based on individual claims

Nowadays, due to market opening, energy markets cannot be analysed without taking into account regional environment. We monitor the market situation and developments of the countries of the Central Eastern and South East European region. We have built a regional electricity market model including 15 countries to forecast regional electricity prices.

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HEO (Hungarian Energy Office), GVH (Hungarian Competition Authority), KVVM (Ministry of Environment and Water), GKM (Ministry of Economy and Transport), FVM (Ministry of Agriculture and Rural Development)

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