Non-cost barriers to renewables – *AEON* study

Hungary

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1 Introduction

In order to understand the situation of renewable energy, and especially the application of the Directive 2009/28/EC one have to first familiarise somewhat with the energy situation of Hungary and the road of the last few decades that lead to this stage.

Similarly to other Central European counties, while depending politically on the former Soviet Union, owing to the relatively low level of availability of domestic energy sources, the dependence was also strong from the energy point of view. This era corresponds to the time of "cheap and abundant" what energy is concerned. Environmental issues were neglected, energy efficiency or reduction of energy use were unknown expressions. Massive amount of new buildings and houses were erected based on this "energy principle". Industry considered energy as an endless flow coming into the process through gas pipelines, or in a form of oil or carbon. No engineered system considered energy as a resource one must economise with; insulation, energy rationalisation, resource management were simply left out of the picture.
This was the prevailing attitude, when in the late 80's early 90's the independent Hungarian economy and its citizens paid larger and larger energy bills. Industry utilised energy with rather low efficiency (high specific energy use), people leaved in houses with hardly any insulation, etc. A relatively poor county with relatively poor citizens: none could afford to invest to improve energy use patterns thus reducing energy bills. This situation conserved itself: resources were just enough to pay the bill, did not allow any refurbishment or improvement. In a recently published report (Ürge-Vorsatz, 2010) Hungary is classified as a country of fuel poverty. The study states that for more than 80% of the Hungarian population the energy bills exceeds 10% of their income, thus lives in fuel poverty.
Many industrial actors went bankrupt, entire subsectors extinct. Modern, more efficient technologies were chiefly delivered by foreign investors, buying smaller or larger shares of the low profile companies. Step by step modernisation, the total dying out of heavy industry and some sectors of manufacturing (e.g. aluminium production, smelting, machinery production etc.) improved the industrial figures smoothly. Today it can be stated that the overall efficiency of the industry caught up with that of the industrialised countries (except energy intensity the nominal values are similar to the EU average). Interestingly enough, in case of limestone production, the Hungarian subsector is among the best in terms of specific energy use, owing to the fact that the few operating facilities were fully refurbished and were set up to use natural gas in last few years.
Similar improvement in the tertiary and domestic sector is still lagging. The total energy use of the Hungarian households exceeds that of the industry, requiring one third of the total energy use of the country. The use of primary energy sources and electricity generation are similarly obsolete. Some half of the existing power plants are outdated and inefficient, and to be replaced in the coming 15 years. The total installed capacity of roughly 9 GW consist of natural gas, oil, coal and nuclear in order of importance.

Renewables adds around 6%, 90% of which is biomass, chiefly firewood. The energy mix is still heavily relying on imported oil and gas (90% of the total imported energy) mainly from Russia (EC, 2010).

Entering the EU in 2004 Hungary committed itself to follow the common European pathways in energy issues too, including renewable technologies. The country adopted and adopts since then all energy related decisions, decrees, directives etc. in time. As a consequence the issue of RES is not a legislative problem but a matter of financing and determination.
The relatively high level of corruption that waves through the entire economy affects energy production and distribution also, as large transfers and major interests are involved. The lack of country-wide, practical and harmonised conceptual plans for the entire energy sector, including renewables and energy policy, and the conservative approach to energy issues helps to conserve the situation.
Renewables have been successfully marginalised for long time. It is the economic downturn and the relatively high price of the fossil energy sources that turns more and more people and institutions to the renewables. Unfortunately, the recession reached Hungary in a weak economic position, when both citizens and the entire economy were lacking resources. Since renewable sources usually require large specific investment (per kW) and produce energy cheaper than conventional sources, renewables stays unreachable for the broader public.

There is a general level of common understanding that the share of renewables should and could be improved. When the “how?” and “how much?” are the questions, this harmony seems to vanish.
Hydro is a black sheep. Dated from the ‘80s and initiated by the strongly opposed water dam projects of the former Czechoslovakia and Hungary, aiming to build several dams on the Danube (one was actually built in Slovak territory removing large amount of water from the original river bad; issue which is since then debated), the Hungarian public is just inherently opposing any kind of hydro power plant; even the ones with no or minor (environmental) effects. Besides the existing few large and a dozen of small and medium hydro plants (37 altogether, 50MW installed capacity [Energia Klub, 2010]), only one small plant was commercialised in the last 20 years.
Wind is the other “extreme”. Wind is accepted by the broad public, even bird associations are far less refusing than in other European countries. Land owners welcome them too, profiting substantially from the land use fees. It is the transmission system operator and some grid experts who stand against the faster expansion of wind turbines, saying that the Hungarian grid is lacking the necessary backup/storage required for implementing more wind power into the system, a statement that is widely debated. Starting in 2001 (first, 600 kW commercial wind turbine started the operation), the built in capacity has increased substantially (slightly exceeding 200,000 MW at the end of 2009 [HVEA, 2010]).
Solar and geothermal are hand in hand. For both resources the country is among the ones with relatively large potential, still little improvement has been made. In case of solar, a typical small scale (built-in) resource, the lack of capital, freely available knowledge and some sort of reluctance that prevent the spread of the technology. While solar panels for domestic hot water production are gaining popularity recently, PV is rather expensive in Hungarian terms.

For geothermal, both shallow and deep, it is primarily the large investment cost that hinders the advance. Shallow is showing a fast upturn (but still low in absolute figures), Hungary still misses a deep geothermal power plant. It has to be added, that geological conditions in the Carpathian basin are fairly complex that is also a cause of slow process. Biomass is advancing, as the strong agricultural and forestry history of the country predestines. The raw material (firewood and agricultural residues) is abundant. Since biomass requires the least investments of all renewables and recent support schemes favours biomass equally to other RES, the advance of biomass is clear consequence (providing 86% of the total renewable energy in Hungary in 2006[1]). Biogas production is a stepchild. Though some facilities were built, none of them are linked to the gas pipelines, they operate stand alone and serve nearby installations.

Regarding future changes: in the last weeks parliamentary election took place in Hungary. At the time of writing, results suggest that the former opposition will gain rather strong political power, exceeding even 60%. Energy policy is part of the few key issues the new government is targeting with large effort, so the country is foreseen to face major changes in energy issues.

Ürge-Vorsatz, D., Tirrado Herrero, S. Fuel Poverty in Hungary. 2010.
homepage of European Commission (EC), http://ec.europa.eu/energy/energy_policy/doc/factsheets/country/hu/mix_hu_hu.pdf , last visited 15 April, 2010.
homepage of Energia Klub, www.energiaklub.hu last visited 22 April, 2010.
homepage of Hungarian Wind Energy Association (HVEA), www.mszet.hu, last visited 21 April, 2010.

[1] biomass inculdes firewood and biogas too. The renewable energy breakdown shows 38% biomass, 47% firewood, <1% biogas. source: Bohoczky: Megújuló energiaforrások, ezen belül a napenergia hasznosítás lehetőségi Magyrországon. August 2008. Lecture.

2 Issue 1 Administrative Procedures

2.1 Introduction

In general administrative procedures and legal background are similar to that of the European Union. (Bohoczky, 2010) There are deviations and specialties, but the main line is in harmony with the European expectations. All relevant and yet missing legislations and guidelines will be transposed until the end of this year. It is the practice and the attitude that require changes: general administrations should help the acceptance and distribution and not only require data, studies and more papers to be filled.

It is a general weakness of the public administration that no easement or thresholds are defined that would favour small installations to be licensed on a shorter and maybe formalised track. It is the lengthy and subjective (solutions vary between authorities) attitude of the public administration, that makes licensing often a question of good luck instead of a compliance issue.

Public administration is generally slow, difficult and rigid, licensing is disperse and exhausting. Legislation changes too often, the stable and reliable legal environment is missing. (Energia Klub, 2009).

2.2 Description of barriers & solutions

2.2.1 Detailed description of the Barriers and solutions

Barrier 1.1 – Inefficient general administrative procedures

Long administration procedures (water right permit, shallow geothermal)

In case of shallow geothermal installations the required water right permit is issued between 2 months to 12 months. If application is not handed in early enough, either building procedure might be delayed or the level of uncertainty is raised, as in case of a possible denial the technology needs to be re-planned, gas pipelines plus different heating technologies and the required auxiliary system needs to be built. (Ádám and Tóth, 2010).

Possible solution: shorten and standardise the application procedure, provide benchmarks (if they are fulfilled, the license can be “automatically” issued).

Administration often can not meet the set and already long deadlines

It is a common behaviour of licensing authorities to postpone the deadlines set by law with different excuses. The delay is usually caused by overall bureaucracy and the lack of standard way of procedures.

Possible solution: Formalise the licensing procedure, and/or provide authorities with guidelines and standards especially for small and simple cases.

Lack of benchmarks or publicly known expectations
Though licensing is generally regulated by law, in reality the process differs case to case. During the licensing procedure authorities follow a rather subjective pattern. (Kircsi, 2009; Energia Klub, 2009).

Possible solution: Should a clearly defined set of expectations exist to certain, well-defined cases than applicants/investors would have clear cut expectations regarding licensing procedure.

The attitude and implicit expectations of authorities vary from region to region
Somewhat similar to the previous case, but here not the subjective attitude of a given authority, but the different way the regional authorities behave is the question. There are no regional differences in the background but simply the (slightly) different understanding or customs of the regional institutions.

Possible solution: A published guideline that would channel the arrangement of applications and narrow down the path of subjectivity.

The procedures and requirements are often not proportionate to the extent of the project or even to the "complexity" (simplicity) of the technology
There is no differentiation in licensing in the same technology regarding e.g. installed capacity or any kind of complexity. A small installation is required to hand in the same level of documentation as a large one. This hinders small installations to be considered, and so blocks small scale systems to spread (especially building integrated or autonomous technologies, independent of any distribution network). (Bányai, 2010).

The lack of one stop-shop licensing (Energia Klub, 2009; Balogh. 2010a).

Excessive expectations are also to be found in application procedures. For NEP/ZBR application, some 20–50 pages long forms have to be filled in, while the value of the application is normally less than 5000 EUR. (Ádám and Tóth, 2010) Beyond the length the required data and information is usually overwhelmingly lot, bureaucratic and not required for the professional understanding of the application. (Ádám and Tóth 2010) For the latest wind capacity extension tender a large some had to be assigned on a bank account in cash as deposit (60000 EUR/MW) during the time of the entire tendering procedure, affecting small and medium enterprises adversely. (Kircsi, 2010).

Possible solution: Simplify administrative procedures, introduce threshold for small scale units (probably exempt them from licensing), introduce one-stop shopping.

Lack of harmony of authorities
As long as one stop-shop licensing is not available, a fair amount of licenses have to be arranged for small/medium sized RES investments. Independent of the type and size, there is a general lack of "self-communicating" authorities. It is the client who needs to

run from one authority to the other and make sure the chain of licensing is continuous and still active, instead of affected authorities communicating with each other and the relevant legal background would regulate it. (Balogh, 2010a, 2010b).

Possible solution: RES law (collect and harmonise diverse legislation affecting RES), clearer/more thoughtful legislation.

Barrier 1.2 – Competing public interests

Nature conservation and/or local interest often contradict with RES application

As large proportion of the territory of the country belongs to Natura 2000 or otherwise protected area, investors find difficult to harmonise their expectations and the restrictions of the given location. (Civin et al., 2010) For pumped storage hydro power stations it is practically impossible to find a location due to public concerns (NIMBY) and nature reserve restrictions. A nearly finished hydro power station development (Békésszentandrás) has been stopped for nature protection issues. (Bohoczky, 2010).

Public interest, furthermore equal rights are also challenged by low enthalpy, small heat pumps. Should neighbouring houses decide to install heat pumps on own premises, in the absence of established protection zones the heat pumps would work against one another, lowering individual efficiency. (Bohoczky, 2010).

Geothermal vs. water protection

According to effective legislation extracted water must be pumped back to the geological layer it was removed from. This expectation is to protect water reservoirs, on the other hand makes high enthalpy geothermal less efficient (due to energy required to press water back) and so less favourable. (Bohoczky, 2010).

Non-energy aspects

As it is, the 2009/28/EC is targeting energy issues, but not purely. In the Hungarian approach other aspects, like reducing unemployment by RES applications, promoting innovation, improving energy safety etc. are neglected and only the energy side is communicated (Balogh, 2010a). This implies that the promotion of the directive would be more efficient and fruitful if it were not only considered as an energy issue, but other (social etc.) aspects would be considered, hence co-operation with other affected sectors/Ministries would strengthen the energy side.

Barrier 1.3 – Inexistent or insufficient spatial planning

There is no expectations regarding RES application in new buildings

There exists no policy for administration to expect/prefer RES in new buildings. To the contrary, RES in new buildings often a drawback and not an advantage from licensing point of view. Local municipality (as a licensing authority for building permit) is usually not aware of RES technologies. Plans without chimney, the lack of conventional (secondary/backup) heating are often criticised, or even cited as cause for denying building permit in small municipalities.

Barrier 1.4 – Other Barriers

Legislation issues (deep geothermal)

The case of deep geothermal installations is just about to change in Hungary. The licensing authority for such applications was the regional Water Directorates until last December (Mining Law 1993/XLVIII, modified on 15 December 2009). Investors complained that deep geothermal was exempt from other mining activities, and so no opportunity establishing "mining plots", that is a geographically determined zone, within which no other similar activities allowed (mining entrepreneurs property). Since the water right permits issued by the Water Directorates defines only the amount of water to be used and "reserves" it for the applicant, competitors might enter the targeted site as the issued license gave no protection.

The modification of the mining law actually divided deep geothermal application into two categories. The ones that are shallower than 2500 m below surface are still required water right permit, the ones that are deeper than that require the license of the District Mine Inspectorate and thus mining easement can be/has to be established, providing a solid border for further geological research and investigations.

Subsidised prices
It is the subsidised gas prices (affecting still more than 1.5 million households in 2009) that is a strong counter interest either energy efficiency or RES application are to be considered. (Ádám and Tóth, 2010).

Renewable law
There is a strong need for renewable law. The existence of such a law would promote RES technologies and also harmonise and collect the diverse legal background that affects RES technologies today. (Energia Klub, 2009) A renewable law would create a more homogeneous, transparent situation for the affected RES technologies, presumably from licensing through operation to acceptance and support schemes.

2.2.2 Best Practice Elements and Indicators

No.	Technology	Benchmark	Result
1.1	All	Is one stop-shopping possible?	Not.
1.2	All	Amount of money to be invested in the administrative process (including cost of work and costs like fees) (in €) Admin (authority) fees are set but other costs are kept confidential by investors, so it is hard to estimate.	
1.3	PV shallow geothermal deep geothermal wind	Time to be spent for the administrative process (duration to get all the main permits) (in months)	<1 2-12 >18 30-40
1.4	PV shallow geothermal deep geothermal	Estimated number of permits required (#)	1 2 >5

2.3 Literature

Ádám, B., Tóth L., HGD Ltd. personal communication on 3 March, 2010.

Balogh, L., MMESZ (Hungarian Renewable Energy Association), A kötelezettségek teljesítésének feltételei (Heti válasz konferencia előadás), [Conditions of fulfilling requirements – Presentation of a Conference organised by "Heti Válasz"], 10 March, 2010a.

Balogh, L., MMESZ (Hungarian Renewable Energy Association), written comments on 20 March, 2010b.

Bányai, I., senior expert, personal communication on 9 March, 2010.

Bohoczky, F., Ministry of Transport, Telecommunication and Energy, personal communication on 16 March, 2010.

Civin, V., Novák, G., Latorczai, Zs., Vajnai A., MVM Ltd., personal communication on 9 March, 2010.

Energia Klub, 2009. Javaslatok a megújuló energiaforrások szabályozási és támogatási környezetének felülvizsgálatához. [Recommendations for the revision of the legal and support scheme of RES].

Kircsi., A. 2009. Windbarriers – egy európai projekt tapasztalatai [Windbarriers – experience of a European project], slides of presentation, 2009.

Kircsi., A., Hungarian Wind Energy Association, personal communication on 25 February, 2010.

Mining Law 1993/XLVIII, modified on 15 December, 2009.

3 Issue 2 Technical Specifications

3.1 Introduction

No explicit technical specification issues arose during either the literature review or the interviews. This does not imply that this area is functioning perfectly well. It can be assumed that these issues are either less important than other problems quoted, or they goes hand in hand with other barriers (that are identified and discussed in other sections) and they can not be separated from each other.

Labelling for appliances and houses/flats (Govt. decree 176/2008, transposing 2002/91/EC) are affective. The decree requires new houses or flats and public buildings larger than 10,000 sqm to obtain an energy label as of 1 January 2009. By 1 January, 2012 all flats and buildings must be audited and must have an energy certificate.

3.2 Description of barriers & solutions

3.2.1 Detailed description of the Barriers and solutions

Due to the immature RES market as such and also because of the weak and poorly financed support scheme of RES technologies technical specifications does not play a crucial role in RES in general. Except (large scale) wind there is only a small but growing interest. It is not technical specification that has critical impact (if any at all) on the development of the market today.

Barrier 2.1 – Weak definitions
As there are only a few support fund available, and none of them are specific to renewable technologies, it is difficult to state that the given technical definitions are weak or not.

Barrier 2.2 – No EU standards applied
No deviation from the EU standards were found or reported. It has to be noted there though that the number of available funds are rather limited, hence it does not automatically imply that the call for tenders or applications are normally barrier-free in this respect.

Barrier 2.3 – Specified locations
No barriers were found or reported.

(It is not certification issue, but affects location. For small scale PV system, if electricity is to be sold for the grid, DSOs often require specific inverters to be acquired (often from specific distributor of company). This is communicated to be explicitly for the interest of electric shock protection, but often serves individual [financial] interest. (Berkovics, 2010; Bányai, 2010))

Barrier 2.4 – Barrier to trade
No barriers were identified.

As the internal RES market is rather underdeveloped, there is little chance or even interest to impede trade in any form.

Barrier 2.5 – Other Barriers

3.2.2 Best Practice Elements and Indicators

No.	Technology	Benchmark	Result
2.1	All	Are specifications expressed in terms of European standards (including eco-labels, energy labels and other technical reference systems), though such European references exist?	yes

3.3 Literature

Ádám, B., Tóth L., HGD Ltd. personal communication on 3 March, 2010.

Bányai, I., senior expert, personal communication on 9 March, 2010.

Berkovics, Á., Garco Co., personal communication on 2 March, 2010.

Government decree 176/2008 on the certification of building energy characteristics.

4 Issue 3 Building integrated technologies

4.1 Introduction

Renewable technologies perceived to be expensive and too “complex”. People but even engineers and technicians consider renewable technologies a great option but difficult to implement and expensive. Even at the present energy prices, the payback time for small installation of solar, wind or shallow geothermal is around 10 years. In case of successful application to supporting funds, this time may be lowered to 6–8 years.

Beyond the communicated positive attitude of the public administration there are little practical help, information or motivation to promote the installation of renewable systems.

There are only a few public buildings (and some private ones) that are refurbished with renewable energy sources, but they are hardly promoted. Some already turned out to be less a success story then they were planned to be (see e.g. the case of Szeged Hospital, www.euractiv.hu).

There appear to be less counter interest between tenants and owners with regards to the use of renewable energy. The reason for this is that real interest to renewable energy is not too high, but also because the share of tenement flats are 8% in Hungary, compared to the European average of 35%, and these flats are almost exclusively provided on a social bases (owned by local governments, given to relatively poor people on an application/needs bases).

More attention is paid to energy efficiency than to renewables these days. It is probably because of the rather bad condition of the Hungarian flats and buildings from insulation point of view. Insulation of houses and especially the old, concrete block of flats are an issue now in Hungary if energy is the question.

If renewables are mentioned, often RES-E is understood by that, though there are much more potential in RES-H (both number of units and total capacity). (Energia Klub, 2009).

4.2 Description of barriers & solutions

4.2.1 Detailed description of the Barriers and solutions

Barrier 3.1 – Inefficient general administrative procedures

It is not the efficiency, but often the need for administrative procedure that was mentioned as barrier (Bányai, 2010; Bochoczky, 2010). In case of small scale wind, PV or solar units there is no need for authority to step into the process, a well "certified" market (both installer and RES units) would make it. E.g. building code requires building permit for wind turbines taller than 6 m (thus practically all), and there is no explicit exemption for autonomous PV or solar units either, though they often do not require licensing.

Once administration or authorities needs to be involved, the process slows down dramatically and the outcome becomes highly subjective. As long as local municipalities are involved (each case if building permit is needed) training of decision makers and local experts is inevitable. Practice suggests that there are little knowledge on RES technologies on local level. (Bányai, 2010).

Barrier 3.2 – No/insufficient specific rules for building integrated/small scale RES installations

There exists no exemption or specific rules for small scale units

The PV and solar installations require no license at all if grid connection is not planned (except some extra cases when building permit is needed). Others, like shallow or deep geothermal, wind require licensing. The licensing procedure is the same in each case, independent of size, power output etc. For more details and solutions see also barriers mentioned in 1.2.

For independent small scale units (including PV, solar, wind) a much less rigorous attitude (administration, licensing, expectations) would help the spread of these technologies. (Bohoczky, 2010) Clear guidelines, information and certified technologies and installers could efficiently substitute the existing bureaucracy.

Barrier 3.3 – Competing public interests

For building integrated renewable sources no other and disproportionate public interests were identified. Certainly there are restrictions that heritage law, building code etc. present, but these are not main or critical problems hindering RES to spread.

Barrier 3.4 – Renewables obligations insufficient

There is no obligation regarding the use or implementation of RES yet. There are many studies and various expert opinions point out the need for one, however beyond general statements from the state administration side no mandatory expectations exist.

Barrier 3.5 – Exemplary role of public buildings neglected

There are only a few public buildings equipped with RES technology (REC Headquarter – Szentendre, Hospital – Szeged). More private buildings are using RES (mainly multinational and/or large companies, e.g. Pannon Headquarter (mobile service provider)

– Törökbálint, K&H (bank) new headquarter – Budapest). These installations are mainly used to show the green attitude of the given firm but not promoted as exemplary cases.

Explain better using examples of technologies.

Barrier 3.6 – RES deployment hindered by spatial planning matters

Somewhat similar to 3.4, there are no expectations from the planners or the investors to consider or apply RES in the newly built or refurbished buildings. It is not that explicit barriers exist in spatial planning, it is more the lack of consideration or guidelines that would channel designers and planners towards RES. (Bányai, 2010).

Barrier 3.7 – Tenancy law and ownership law impedes development of Building Integrated RES technologies

Given the relatively low share of tenement flats in Hungary, this is not a barrier yet.

Barrier 3.8 – Other Barriers

4.2.2 Best Practice Elements and Indicators

No.	Technology	Benchmark	Result
3.1	All	Is this installation type in normal cases exempted from an authorization procedure (building permit)?	no
3.2	All	Are legal-administrative requirements adequate for this installation type?	no
3.3	PV wind	Number of administrations that must be contacted (#)	1 (small scale) >3

4.3 Literature

Bányai, I., senior expert, personal communication on 9 March, 2010.

Bohoczky, F., Ministry of Transport, Telecommunication and Energy, personal communication on 16 March, 2010.

Energia Klub, 2009. Javaslatok a megújuló energiaforrások szabályozási és támogatási környezetének felülvizsgálatához. [Recommendations for the revision of the legal and support scheme of RES].

Euractiv, visited 10 March, 2010 (www.euractiv.hu).

5 Issue 4 – Promotion of energy efficient renewable energy equipment

5.1 Introduction

In general it can be said that RES are not widely promoted in Hungary today. The trends suggest in almost all kind of RES that substantial improvements are ahead. Certainly, the speed and depth of spreading of these technologies can be heavily influenced by adequate promotion campaign and also by proper support schemes.

The existing support mechanisms are fourfold:

- The first is the Green Investment Scheme (ZBR). The fund is provided from quota sharing incomes and must be spent on GHG mitigating measures;
- The second is National Energy Efficiency Programme (NEP);
- Third is EHA Energy Efficiency Credit Fund: continuous credit option for small scale refurbishment and energy efficiency improvements at homes;
- Finally KEOP (Environment, Energy Operation Programme) programmes. These programmes are supported from EU funds in the following area for various stakeholders, mainly for the "rural" part of the country, the capital and the surrounding region is generally not eligible.

5.2 Description of barriers & solutions

5.2.1 Detailed description of the Barriers and solutions

Barrier 4.1 – Non-compliant promotion schemes

Harmonised support schemes

RES can not be considered simply as energy issue. It must not be separated from other positive (side) effects, like employment, fostering and strengthening of small ventures etc. Thus promotion/support schemes should be harmonised with these social/societal aspects and shall promote not only RES. E.g. renewable energy applications and employment activities strengthen each other, with multiplicative effects. (Balogh, 2010a).

Efficiency thresholds

The 7th Annex to the Government decree 389/2007 determines the minimum electrical efficiency in order to qualify for the feed-in tariff. According to the annex the following thresholds are set:

- biomass fired unit min. 30%;
- biomass fired unit, mixed fuel min. 32%;
- biogas fired unit, >500 kW min. 35%;

- biogas fired unit, <500 kW min. 32%;
- biogas fired unit, mixed fuel min. 40%.

Barrier 4.2 – Lack of substitution of existing inefficient systems

As the number of old and inefficient working units are low, it can not be considered as barrier.

Barrier 4.3 – Use of national procedures

No issues were found or reported.

Barrier 4.4 – Insufficient information

As part of the general lack of information, there can be little known about the different efficiency of equipments. There exists no similar scheme or promotion material to that of electrical appliances. It would be a clear and wise thing to promote not RES technologies but efficient ones, especially biomass boilers, since the more and more expensive gas price turns back many users towards traditional wood heating. (A decade ago fairly large number of houses/flats left wood heating for the easily accessible and available natural gas. As gas price rises – retail price grows on average 10% as of 1st April, 2010 – the trend changes too).

Barrier 4.5 – Other Barriers

The relatively large share of grey/black market

It is a commonplace in Hungary that the relatively high level of taxation prevents many investments others are implemented in large numbers on the grey/black market. The examples of last years' energy efficiency tenders targeting general public provide good examples. The available sources were limited both in percentage (usually 30%) and in total sum as well (often less than 50 000 EUR). Since VAT is 25% in Hungary, it was often easier and feasible not to spend time and effort on an uncertain application but get goods on a grey/black market without VAT. (Bányai, 2010; Ádám and Tóth, 2010).

Strong counter interest

It is a general consensus that there is a strong political and also economic counter interest between conventional or fossil fuel and renewable energy sources. (Bányai, 2010; Ádám and Tóth, 2010) Almost all sources claimed that there is a strong opposition of strengthening or helping RES to grow among those circles interested in fossil fuel.

Need for overall public administration reform

There is a strong need for simplified public administration, including the licensing and attitude towards RES. It should include better and smoother information distribution, a much simpler but consistent central administration, and a non-discriminatory attitude towards RES (especially help and not scare off new producers to enter the RES market). (Balogh, 2010a).

Rearrange RES support

The present tariff system is not neutral. KÁT (Compulsory Feed-in Tariff) is favours CHP/biomass, tolerates wind, and neglects/penalizes others, like solar, geothermal and hydro. Last year's fund predominantly (> 70%) covered CHP (HEP, 2009; Energia Klub, 2009), often produced by old, inefficient and large fossil power stations (Balogh, 2010b).

CHP should not be supported but made otherwise competitive, PV shall be more supported in order to promote the spread of and small scale PV units. (Balogh, 2010a, Energia Klub, 2009).

5.2.2 Best Practice Elements and Indicators

No.	Benchmark	Result
4.1	Are the requirements of Art 13 (6) of the Directive concerning the promotion of efficient bioheat and heat pumps fulfilled? (yes/no)	no

5.3 Literature

Ádám, B., Tóth L., HGD Ltd. personal communication on 3 March, 2010.

Balogh, L., MMESZ (Hungarian Renewable Energy Association), A kötelezettségek teljesítésének feltételei (Heti válasz konferencia előadás), [Conditions of fulfilling requirements – Presentation of a Conference organised by "Heti Válasz"], 10 March, 2010a.

Balogh, L., MMESZ (Hungarian Renewable Energy Association), written comments on 20 March, 2010b.

Bányai, I., senior expert, personal communication on 9 March, 2010.

Energia Klub, 2009. Javaslatok a megújuló energiaforrások szabályozási és támogatási környezetének felülvizsgálatához. [Recommendations for the revision of the legal and support scheme of RES].

Government decree 389/2007 on a the Compulsory overtaking and tariff of the electricity generated by renewable energy sources or from waste forms or from CHP plant (23 December, 2007).

6 Issue 5 Information/awareness raising

6.1 Introduction

There is a positive acceptance in all renewable energy technologies among the general public, except hydro and biomass lately. It is (practical) information that is missing on local level. A broad ranged information campaign could initiate massive interest among people. To kick off with such a campaign is not a matter of resources but that of decision and intention. (Bohoczky, 2010).

The overall denial of dams and hydro power plants has a historic origin. It goes back to the ’80s, when the planned series of hydro power plants on the Danube (together with Czechoslovakia) was the **casus beli** for the change of the social and political system. Since then there is a rather negative attitude towards hydro power stations in general, regardless of size or region.

Except one small hydro station (at an existing dam) at Rába river in western Hungary, no hydro station was built in the last few decades. There are a couple of small station planned, there is a general interest in pumped storage hydro power station, as the national grid capacity is generally concerned to be limited by large base load power stations leaving little room to e.g. wind capacity expansions.

Similarly, but much more consolidated public opposition seem to emerge against medium sized biomass power stations (Szerencs 50MW – straw 100%, Mátraterenye 50 MW – biomass 20%). (Kircsi, 2010; Civin et al, 2010; Ádám and Tóth 2010) In these cases local interest (NYMBY), environmental and economic constraints, cultural heritage issues are also quoted.

6.2 Description of barriers & solutions

6.2.1 Detailed description of the Barriers and solutions

Barrier 5.1 – Insufficient availability of information on support measures

As the number of tenders and other application sources are limited, those interested or willing to build RES installations are aware of these opportunities. Beyond financial issues (lack of sources, short lived (1 month) tenders etc. that are beyond the scope of the study) it is not the information available, but the difficulty and complexity of application forms, the application procedure itself and the level of bureaucracy that is often criticised (see above).

Barrier 5.2 – Insufficient funding for campaigns/programmes

There is no known campaign running promoting RES (and was none in the last few years). As neither real strategy nor measurable and substantial supporting mechanism exist, it would not be wise to suggest a broad ranged information campaign. However, general awareness raising is also missing, that would prepare a later promotion.

There are "Szél napok" ("Wind Days") when most of wind turbines are open to the general public to visit. This annual promotion activity is mainly sponsored by EU funds and operators, so far no contribution from governmental sources (Kircsi, 2010).

Barrier 5.3 – Insufficient campaign-/programme-design

Positive attitude

The promotion of benchmarking, "best practice" examples or accepting external costs in tenders/application is missing.

Barrier 5.4 – Other Barriers

Hydro means something bad

The expression hydro power triggers almost automatic refusal in the Hungarian public. The geographic location and the topology of the country imply that the share of hydro shall not be high, provided that the majority of Hungary is flat, with little (high enough) mountains. The given extra low share of hydro is considered to be the result of subjective or even emotional attitude and not scientific evidence.

The lack of pumped storage hydro power station is often quoted as a weakness of the national grid as there is little room left for the regulation. (Civin et al, 2010; Ádám and Tóth, 2010) The relatively low share of renewable is often explained by the rigidness of the national electricity grid and system, which is usually reported to be caused by the bad levelling and backing of large base load power plants. There is no consensus regarding the need for pumped storage among experts either (see e.g. REKK, 2008), but the general public refuses it.

Extensive presence grey/black market

The wide spread presence of grey market is not only a financial problem. (Ádám and Tóth, 2010; Bányai, 2010; Berkovics, 2010) In those issues when cheaper solutions of the grey market or reliable and guaranteed services of professional technicians are competing, it is not only the matter of resources but also the question of careful consideration of long term interest: safety and trustworthiness. Short term thinking and high price sensitivity of Hungarian people give large space for fraudulent promises. Cheap but incompetent and non professional services may often cost more than certified and reliable system installed by trained experts.

Innovation allowance

Innovation allowance is a sort of tax enterprises pay, and is proportional to the revenue. It is either paid to the tax authority or (partially) can be used to support "innovative" technologies, e.g. RES. There is a competition for the allowance of large/multinational companies, who's allowance is substantial. The use of this allowance for small scale RES installation is hardly known. It could be promoted, or even part of the allowance could be required to be used for RES. (Berkovics, 2010).

An extinct species: energeticist
The once existing positions of energeticist of almost all large companies, energy users and local governments almost ceased to exist nowadays. As a consequence, there are no experts with hands on experience and knowledge on energy issues. These people could promote energy efficiency and local solutions (RES) at local levels (not only in local governments but could be also available for local people too). (Bohoczky, 2010) They would also be a base of two way information distribution, promoting RES and informing decision makers on local activities and opportunities.

6.2.2 Best Practice Elements and Indicators

Please fill in here the results of the Benchmark indicators:

No.	Benchmark	Result
5.1	Is sufficient information on support measures available?	yes, but not promoted

6.3 Literature

Ádám, B., Tóth L., HGD Ltd. personal communication on 3 March, 2010.

Bányai, I., senior expert, personal communication on 9 March, 2010.

Berkovics, Á., Garco Co., personal communication on 2 March, 2010.

Bohoczky, F., Ministry of Transport, Telecommunication and Energy, personal communication on 16 March, 2010.

Civin, V., Novák, G., Latorczai, Zs., Vajnai A., MVM Ltd., personal communication on 9 March, 2010.

Kircsi., A., Hungarian Wind Energy Association, personal communication on 25 February, 2010.

REKK, 2008. A szivattyús energiatározás kérdésének közgazdasági elemzése [Economic evaluation of the question of pumped storage].

7 Issue 6 Certification

7.1 Introduction

As mentioned previously, RES market is underdeveloped in Hungary, especially is small scale units are examined. Public awareness is low, but just like acceptance is positive and growing.

Besides information and chiefly financial barriers, the third most important point hindering a massive spread of use of renewable sources are trained, knowledgeable installers with practice. There are plenty of rooms for "self-made experts" and inexperienced contractors. Though as market would develop these groups should fail and fall out, the presence of grey market keeps them still alive. These groups provide cheaper services than certified, official installers, and the price sensitive public prefers lower price to reliability and professionalism.

7.2 Description of barriers & solutions

7.2.1 Detailed description of the Barriers and solutions

Barrier 6.1 - Lack of a Certification body

There are neither registered training system, nor certification body exist for installers, technicians etc. Neither literature survey, nor interviewed experts reported school of training centre with specific curricula for RES applications. Both engineers and installers (technicians) working on the renewable market are trained as general engineer/craftsman and self-learned (mainly from practice) the know-how of renewable technologies. (Except geothermal, University of Miskolc has recently started a 2 years MSc course, mainly for the use of high enthalpy geothermal energy. Other universities also plan to start or about to develop the curricula of MSc courses on geothermal, alternative energy use e.g. Szeged University, Debrecen University, Gödöllő University).

Barrier 6.2 - Lack of guidelines

There are no guidelines or recommendations exist that planners, architects should follow. There are no guidelines even for authorities what could be expected regarding the use or even optimising the use of renewable energy. As the number and spread of planners with relevant knowledge is rather limited, due to the fact that present MSc curricula contains little adequate information, even if guidelines were exist, there would be only a small number of designer to apply them now.

Possible solutions: Adding renewable energy to the curricula of designers, architects, engineers etc. and simultaneously setting clear guidelines for authorities they should require in case of new houses would clearly make a difference.

Barrier 6.3 - Lack of training

Low quality technical training

While engineers are considered to be trained well enough (Civin et al, 2010; Bányai, 2010; Berkovics, 2010; Ádám and Tóth, 2010, Kircsi; 2010), the curricula and knowledge of technicians are widely criticised. Both attitude and actual knowledge reported to be inadequate to meet the expectations of the various and emerging RES technology (Bányai, 2010; Ádám and Tóth 2010). Since this is a general issue, affecting not only renewable sources but also other sectors of the national economy, it is an overall educational issue, and not a specific barrier of RES.

It was also mentioned that in many cases is not (just) knowledge issue but that of practice. As the spread of small scale technologies are limited, there are not many rooms for practitioners to develop and mature hands on experience. (Berkovics, 2010; Ádám and Tóth, 2010, Bohoczky, 2010) The low number of qualified professionals with adequate training might easily be a bottleneck if extensive promotion of RES is planned, especially small scale solar (both solar panels and PV). (Energyi Klub, 2009) Thus a practical RES strategy/campaign must not only consider direct technical/financial etc. issues, but have to approach indirect issues like education. (Bohoczky, 2010).

Barrier 6.4 – Other Barriers

Certified installers, RES "yellow pages"

A list of certified experts/installers would help to reduce the number of "less-qualified", self-trained impostors, and would improve the credibility of RES technology. (Balogh, 2010a; Energia Klub, 2009).

7.2.2 Best Practice Elements and Indicators

No.	Benchmark	Result
6.1	Are certification schemes or equivalent qualification schemes available for installers?	no
6.2	Is sufficient training on RES provided during the standard education curriculum of installers?	no

7.3 Literature

Ádám, B., Tóth L., HGD Ltd. personal communication on 3 March, 2010.

Balogh, L., MMESZ (Hungarian Renewable Energy Association), A kötelezettségek teljesítésének feltételei (Heti válasz konferencia előadás), [Conditions of fulfilling requirements – Presentation of a Conference organised by "Heti Válasz"], 10 March, 2010a.

Bányai, I., senior expert, personal communication on 9 March, 2010.

Berkovics, Á., Garco Co., personal communication on 2 March, 2010.

Bohoczky, F., Ministry of Transport, Telecommunication and Energy, personal communication on 16 March, 2010.

Energia Klub, 2009. Javaslatok a megújuló energiaforrások szabályozási és támogatási környezetének felülvizsgálatához. [Recommendations for the revision of the legal and support scheme of RES].

Kircsi., A., Hungarian Wind Energy Association, personal communication on 25 February, 2010.

8 Issue 7 Infrastructure Development

8.1 Introduction

The quality of the national main grid and its development is according to international expectations, it meets the national consumption customs and patterns. The operational breakdowns are less and less frequent, the relevant indicators improve continuously. There are problems at distribution level. Neither quality, nor improvements meet the standards of a modern, flexible network. (Bányai, 2010) The high voltage grid is developed and updated according to a public plan (yearly, medium and long term run), no problems are reported in this issue. The (medium and low voltage) distribution network is relatively dense, except remote farms access to electric grid is no problem. It is the quality and age of the network (the age of the network elements are 42 years on average) that hinders further development, and also responsible for the outages. Relying on aerial cabling the distribution network is highly sensitive to meteorological extremities. There are no sign of considering smart grid development, or making steps towards that direction.

The linkage of the national grid to a European level system could provide also simple solution to the unpredictable nature of wind and solar energy generation, as the variation on European scale would most probably level out. (Kircsi, 2010).

8.2 Description of barriers & solutions

8.2.1 Detailed description of the Barriers and solutions

Barrier 7.1 - Problems concerning connection to existing electricity networks
Access tot he national grid is regulated by Electricity law (VET: LXXXVI/2007). Its aim is to provide equal access to the grid to all producers, and also states that renewable electricity is a preferred source.

The Hungarian grid has virtually no active or passive storage capacity. Active solution, like pumped storage hydro is blocked by public protest and nature conservation counter interest, while large batteries are still expensive though feasible. (Civin et al, 2010) MVM/MAVIR is keeping a close eye on both solutions, several plans have been made public, including also pumped storage hydro power station abroad. (MVM; 2009b).

Barrier 7.2 - Problems concerning development of electricity network infrastructures according to a long-term strategy
Obsolete distribution network

Electricity price contain a small fee for grid maintenance and development. This seems to have no effect on the quality of distribution network whatsoever. Except downtown, most low voltage distribution network consists of aerial cables on wooden poles, with infrequent transformers installed. Wiring should be continuously updated and put underground. (Bányai, 2010).

Barrier 7.3 - Problems concerning development of a Trans-European Electricity Network
Given the central location of the country, there are cross boarder connection with six countries. The only neighbour without electricity connection is Slovenia. The existing eight connection points are mainly on 400kV, 750 kV connection only exist towards Ukraine and Austria. Among medium term plans, the expansion of the Austrian, Slovakian and Croatian is targeted. The Austrian grid connection development has been recently granted by EU funding through the large energy development pack.

Levelling RES
As the output of major renewable energy sources are heavily depending on the (meteorological) circumstances (wind, sunshine), the lack of energy storage or buffer often considered to be a significant barrier to the spread of these resources (Bányai, 2010; Civin et al, 2010). However, there are other solutions to level out the varying output. One is a broad ranged and interlinked trans-European grid. As storage capacity of the national grid is minimal, the development of TEN could partially cover this issue. (Kircsi, 2010).

Barrier 7.4 – Other Barriers

8.2.2 Best Practice Elements and Indicators

No.	Technology	Benchmark	Result
7.1	gas, electricity	Presence of an efficient (in terms of capability of achieving its stated objectives) plan for the reinforcement of the interconnection capacity with neighbouring countries.	yes
7.2	gas, electricity	Presence of an efficient plan for the reinforcement of the connection capacity within the country.	yes

8.3 Literature

Bányai, I., senior expert, personal communication on 9 March, 2010.

Civin, V., Novák, G., Latorczai, Zs., Vajnai A., MVM Ltd., personal communication on 9 March, 2010.

Electricity law (VET) LXXXVI/2007, 2007.

Kircsi., A., Hungarian Wind Energy Association, personal communication on 25 February, 2010.

MVM, A szivattyús energiatározók helyzete Magyarországon [The situation of pumped storage hydro power stations in Hungary], presentation notes, 2009b.

9 Issue 8 Power Grid Issues

9.1 Introduction

Although Electricity law (VET: LXXXVI/2007) prefers electricity from renewable sources, in practice there are quite a few (small) barriers that prevents or makes RES-E to be sold to the grid difficult.

The decision making mechanism of DSOs regarding grid connection is far from being transparent. No public standards are set issues are handled on case to case bases. The connection point and required network investment is set by the DSO, making it an open playground for them.

In some cases feed-in tariffs might be low (for solar the feed-in tariff is 70% of the retail price of electricity) (Gov. decree 389/2007). It prevents (together with other difficulties, like technical expectations to grid connections of DSOs) small scale producers to link to the grid and sell electricity.

9.2 Description of the barrier

9.2.1 Detailed description of the Barriers and solutions

Barrier 8.1 - Problems concerning grid connection

Grid connection is in the hand of DSO

Both connection point and the required investments are decided by DSO. No clear and mandatory standard exist for grid connection on national level. This implies that DSOs set different technical expectations towards grid connection (Bányai, 2010).

Barrier 8.2 - Problems concerning grid access

In general, access to grid is described and regulated well. The necessary technical regulations are covering the entire public sector, especially the case of small scale units. (Bányai, 2010) The practice differs from theory. The applied tools are not always according to the set regulations. In case of selling electricity to the grid: DSOs force the owners of small scale units to purchase necessary supplementary tools from dedicated vendors (not quality issue, as the sold units qualify, but financial and against free market). (Bányai, 2010).

Barrier 8.3 (former barrier 9) - Problems concerning TSOs and DSOs

Access to wind turbines

MAVIR, the TSO prefers high level control over wind turbines, including full power output control, instead of considering regional level regulation. (Kircsi, 2010; Energia Klub, 2009) To have full control over individual plants and units makes system management simpler for the TSO. Regional power management affecting more plants and handling them simultaneously would make power management a more difficult issue, on the other hand would also allow more renewable sources to be deployed.

Barrier 8.4 – Other Barriers

Mandatory selling

There is no possibility for wind park owners to sell electricity to others but DSOs. Should this be changed (a new regulation is to come, this situation might change in the near future) producers would have the chance e.g. to cooperate with other, regional producers (not necessarily renewables, but preferably regulable) and sell electricity as a joint venture to the merchants. (Kircsi, 2010).

Grid capacity

The national grid is widely considered to be too rigid (without storage capacity). Backup is provided by gas turbines. Pumped storage hydro is thought to be a viable solution but nature conservation issues and massive public opposition hinders that. (Ádám and Tóth, 2010; Civin et al, 2010).

9.2.2 Best Practice Elements and Indicators

No.	Technology	Benchmark	Result
8.1	all	Are the rules on cost sharing and bearing of grid connection objective, transparent and non-discriminatory ?	yes*
8.2	PV, wind	Is the denial of grid connection by TSOs and DSOs a common problem, constituting an important barrier for RES development?	no**
8.3	small PV wind biogas	Number of months for getting grid connection (considering also approval of grid connection)	1-3 8-10 8-12
8.4	small PV wind	Estimated connection costs in Euros (in case producer pays)	400 NA

* If the attitude of "the producer pays all cost" is understood as non-discriminatory. In all cases (PV, wind) the cost of joining to the grid and selling electricity are paid by the producer.

** There is usually no direct denial. In case of PV, the scale is so low, that there is no need to deny. It is only a costly electric shock protection system that they require, which keeps the number of small producers low. In case of wind, there situation is different. Auctions are organised for the available capacity, where the right to produce electricity could be win.

9.3 Literature

Ádám, B., Tóth L., HGD Ltd. personal communication on 3 March, 2010.

Bányai, I., senior expert, personal communication on 9 March, 2010.

Civin, V., Novák, G., Latorczai, Zs., Vajnai A., MVM Ltd., personal communication on 9 March, 2010.

Electricity law (VET) LXXXVI/2007, 2007.

Energia Klub, 2009. Javaslatok a megújuló energiaforrások szabályozási és támogatási környezetének felülvizsgálatához. [Recommendations for the revision of the legal and support scheme of RES].

Government decree 389/2007 on a the Compulsory overtaking and tariff of the electricity generated by renewable energy sources or from waste forms or from CHP plant. (23 December, 2007).

Kircsi., A., Hungarian Wind Energy Association, personal communication on 25 February, 2010.

MVM, A Magyar villamosenergia-rendszer 2008. évi statisztikai adatai [Statistics of the Hungarian power grid, 2008], 2009.

10 Issue 9 Gas Network Issues

10.1 Introduction

Gas network is extremely dense in Hungary. More than 80% of the flats have access to the gas network. This would imply that fairly large number of biogas installations could feed in biogas to the pipeline.

Unfortunately the practice of gas service providers in the near past discouraged investors of biomass plants. The conditions of linking to gas pipeline were so severe that large scale or medium sized biogas stations project were stopped, or re-designed to lower output and supply neighbouring facilities. (Bányai, 2010).

Strangely enough the dense gas network and the easy accessibility of clean and easy to use natural gas is a barrier itself. As non-commercial users shifted to natural gas in large numbers and so made all necessary changes in their houses/flats, can not afford another investment to fulfil the criteria of RES. (Bohoczky, 2010).

10.2 Description of barriers & solutions

10.2.1 Detailed description of the Barriers and solutions

Barrier 9.1 – No encouragement for upgrading
As the prevailing support mechanism prefers electricity to be produced and sold to the grid, and medium and large biogas stations were scared off to produce biogas for the gas network, there is no unit as of today that considers selling biogas. Small and medium sized stations are being built but all of them produces gas for own use or sells biogas in the vicinity.

Barrier 9.2 – Lack of information
It is not the lack of information that prevents biogas to be sold for the national gas network. The willingness and a transparent system of biogas overtaking that is needed first.

Barrier 9.3 – Authorisation procedures
This issue was not mentioned as a barrier.

Barrier 9.4 – Lack of incentives for infrastructure owners to open to biogas
Network owners prevent biogas to be injected to the gas network, even though the quality and composition of the biogas qualifies. Furthermore, biogas producers would invest to

the required expensive technical solutions required by the network owners, the injection of the produced biogas is still hindered. (Bányai, 2010).

Barrier 9.5 – Other Barriers

Local networks

As mentioned before, the Hungarian natural gas network is extensive the majority of households have access to that. It also implies that relatively long distribution pipelines were built in order to serve the network, part of which is old. The maintenance of the supply network, especially old and large diameter pipes are costly. There is a clear chance to shift part of the funding that needs to be spent on those main pipelines where regional biogas plants or local DH facility could be a feasible alternative, and use resources to promote local solutions.

10.2.2 Best Practice Elements and Indicators

No.	Benchmark	Result
9.1	If green certificates and/or subsidies for biogas are in place, do they de facto make unattractive to feed green gas into the grid due to the high level of subsidy for biogas used for electricity generation?	no*
9.2	Are the costs of grid connection for producers of gas from renewable energy sources objective, transparent and non-discriminatory?	yes
9.3	Do transmission and distribution tariffs discriminate against gas from renewable energy sources?	no
9.4	Average time needed for grid connection approval (from application for grid connection to formal approval) in months (#).	NA**

* There is no subsidy for biogas injection into the gas network.

** As of today there is no biogas plant connecting to the gas network.

10.3 Literature

Bányai, I., senior expert, personal communication on 9 March, 2010.

Bohoczky, F., Ministry of Transport, Telecommunication and Energy, personal communication on 16 March, 2010.

11 Issue 10 District Heating

11.1 Introduction

Some 650 000 flats uses the services of district heating facilities in Hungary, providing heating for more than 16% of the flats in the country. Since district heating is operated mainly in cities, in densely populated areas (district heating concentrates to the central part of Hungary, including the capital), somewhat more than one fifth of the population of the country is living in flats supplied with district heating.

District heating is mainly linked with cogeneration (CHP). The share of cogeneration as a percentage of the overall produced electricity in Hungary is shown in the following table.

	2002	2003	2004	2005	2006	2007	2008
Share of CHP in total electricity production (%)	15.1	17.9	19.5	20.5	22.6	21.8	21.7

Source: Energia Központ, CHP statistics (2010).

The general idea in Hungary is that district heating is expensive and inflexible. District heated flats are usually found in block of flats in cities of Hungary, mostly build after the Second World War. These buildings are usually old, with rather bad or hardly any insulation applied, equipped with old and bad quality windows and doors. Since at the time of the installation (mainly from the 50's until the 80's), individual measuring was not an issue due to cheap (subsidised) energy prices, the advantage of once cheap heating solution turned out to be a drawback of today's relatively expensive, not measurable and inflexible system.

However, besides community interest of keeping a large service industry alive and maintaining greenhouse gas emission relatively low (as district heating is predominantly provided from CHP, thus replacing them would require burning fossil fuel, mainly gas), there are specific issues that retains people of replacing district heating with central heating.

The advanced level of natural gas pipeline infrastructure penetration (well over 90% of the settlements, including very small villages, are connected with the natural gas system) makes the substitute position of either RES heat or DH CHP difficult, as natural gas is a convenient, simple and clean energy source.

11.2 Description of barriers & solutions

The district heating companies are considered large, non-transparent, fairly inflexible partners. Beside the relatively high price people generally leave district heating system because of that.

Barrier 10.1 – Lack of positive conditions for the increase of the share of renewables in existing DHC systems

A modern DH system is required

Individual measuring and controllability of heat used and consumed, renewed and flexible distribution network, efficient heat production are the major issues that prevent DH to be feasible and competitive.

Instead of large, independent central facilities (mainly cogeneration plants often with gas engines) providing heat of large cities or districts, small heating facilities with buffers serving a few thousand flats would be more flexible solution (Bohoczky, 2010; Balogh 2010b). If interlinked with each, the network of the small heating units would also provide each others backup, so stability and robustness would be also improved. These interlinked heat producing plants (heat-only, so high efficiency, >80%) could also be feasible in less densely populated areas. Should they be installed outskirts, not just emission but air quality would also improve. (Bohoczky, 2010).

Barrier 10.2 –Lack of positive conditions for the initiation and expansion of DH systems largely based on renewables

There is no support mechanism for RES to be used in DH

DH is supported indirectly through feed-in tariff for CHP. The target of the support mechanism (KÁT – Compulsory Feed-in Tariff) is electricity produced by cogeneration, thus producers aim to maximise electricity output. (Bányai, 2010) Occasionally a part of the produced heat/steam of gas engines is wasted and dissipated through cooling circle. (Bányai, 2010).

The biggest DH company, Főtáv, supplying over 240,000 flats and 6000 industrial partners plans two biomass plant to be built in the coming year (Főtáv, 2010; Bányai 2010). Though the idea behind is to modernise heat production units, it has to be noted that both units will be erected close to the Danube, leaving thus the relatively large potential of heat pumps untouched. (Balogh, 2010b) Plans also exist to use geothermal for heating (Főtáv, 2010).

Barrier 10.3 – Other Barriers

Technical issues

As there are no or hardly any buffers in DH systems, especially where heat is produced in cogeneration, the heat can not be stored. Given that CHP is supported through feed-in tariff, producers optimise the system output for electricity. (Bányai, 2010).

Counter interest between insulation and DH

Energy efficiency improvements in DH flats (insulation) lowers the energy needs, thus the heat required, so the heat produced. Since most of the heat is produced in CHP, the reducing need for heat reduces also the electricity produced. Since the support scheme

(KÁT) rewards electricity produced by CHP, the income will decrease twofold (reduced production, plus reduced support). Emission quotas will thus be also affected.

11.2.1 Best Practice Elements and Indicators

Please fill in here the results of the Benchmark indicators:

No.	Benchmark	Result
10.1	Are there policies to promote the increase of the RES share in existing DH networks? (yes/no)	no
10.2	Are there policies to promote the initiation / expansion of DH networks? (yes/no)	no
10.3	Percentage present renewable share (Ecoheat, 2007)	8%
10.4	Percentage CHP share (Ecoheat, 2007)	>50%

11.3 Literature and Sources

Balogh, L., MMESZ (Hungarian Renewable Energy Association), written comments on 20 March, 2010b.

Bányai, I., senior expert, personal communication on 9 March, 2010.

Bohoczky, F., Ministry of Transport, Telecommunication and Energy, personal communication on 16 March, 2010.

Ecoheat, 2007. DH statistics. www.ecoheat.org.

Energia Központ Kht, Váti Kht, 2010. Energiatérkép [Energy Map]. https://teir.vati.hu/Energiaterkep/main.

Energia Központ Nonprofit Kft. 2010. A hasznos hőigényen alapuló kapcsolt energiatermelés belső energiapiacon való támogatásáról és a 92/42/EGK irányelv módosításáról szóló 2004/8/EK irányelv szerinti adatszolgáltatás [CHP statistics].

FŐTÁV Zrt, www.fotav.hu, 2010.

GKM, 2008, Megújuló stratégia [Strategy for RES].

GKM, Energia Központ Kht. 2008. Magyarország nemzeti energiahatékonysági cselekvési terve [Energy Efficiency Action Plan of Hungary].

HEO, 2009. Az átvételi kötelezettség keretében megvalósult villamosenergia-értékesítés főbb mutatói 2009 I. félévében [Main figures for electricity acquisition covered by feed-in tariffs in 1st half of 2009].

KHEM, 2009. Előjelzési dokumentum. [Forecast Documentation.].

Major, B., Budapest Erőmű Ltd., personal communication on 2 March, 2010.

Origo, Százezrekbe kerülhet a távhő elhagyása [Leaving DH may cost hundreds of thousands], http://www.origo.hu, 2009.

Tatabanya, the homepage of the city, http://www.tatabanya.hu/index.php?nid=1500, 2010.

Wikipedia. Market penetration of district heating, http://en.wikipedia.org, last modified 10 Marc, 2010.