REDUCING
HOUSING
INEQUALITIES

National Report on the regulatory system of EEPs in Hungary

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Author(s)	Báthoryné Ildikó Réka Nagy, Éva Gerőházi, Julianna Szabó, Eszter Somogyi (MRI)
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This document has been prepared in the framework of the European project ReHousIn – "Contextualized pathways to reduce housing inequalities in the green and digital transition".

The ReHousIn project aims to spark innovative policy solutions towards inclusionary and quality housing. To achieve this, it investigates the complex relationship between green transition initiatives and housing inequalities in European urban and rural contexts, and develops innovative policy recommendations for better and context-sensitive integration between environmentally sustainable interventions and socially inclusive housing.

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1 Executive Summary

The current report is the final version of the study on the assessment of the regulatory framework of Energy and Environment Policies in Hungary. It aims to present the conditions in which retrofitting, densification and Nature-based Solutions are implemented. It also aims to set the first hypothesis on the impact of these three policy interventions into housing inequalities. This issue is not researched nor discussed in Hungary yet, for several reasons.

One of the main reasons can be the lack of large scale public-led urban development projects that are either of green nature or intend to create affordable housing solutions. Consequently the traditional trade-off between the green content of a new development versus providing affordable housing is far not the question that was ever raised.

Patchwork retrofitting interventions in a primary (over 97%) privately owned housing environment have much less and much less rapid impact on real estate prices and the change of residents. Densification in the already dense urban structure, in case it has a patchwork style, also hardly reaches a critical mass that changes the social environment. While large scale densification projects happen on brownfields that do not have original residents, and these projects are poorly market based, not considering affordable housing provision at all. Green interventions are mostly of patchwork nature as well, and except for the major urban centres, these green interventions are small and build on the already existing green areas, not resulting in a completely new living environment.

For all these reasons gentrification or renoviction is not discussed in the context of green investments. What is rather discussed is the consequence of the absence of green investments on the quality of living and the quality of housing. Coping with the challenges of climate change, the heatwaves and the uncertain energy supply requires green interventions which are currently going on at a rather low intensity. Due to not meeting certain legislative and political conditions, Hungary has a limited access to EU funds, and the economic recession also limits the financial scope public entities have. The financial difficulties are coupled with the strong centralisation process since 2011, which has taken away several funds and competencies from local municipalities, who are otherwise the actors responsible for local housing, spatial planning and green investment.

2 Introduction and methodology

The current study is the final version of a national report on the framework conditions of green investments in Hungary.

It covers the three major themes of ReHousIn, namely the retrofitting of residential buildings, the Nature Based interventions in urban areas and the densification processes in and around urban centres. The three themes are covered by main chapters, broken down to sub-chapters on the policy cycle, the implementation process, the role of the market and the multi-level governance. All three themes end with the measured and potential impacts of green investments on housing inequalities.

The study is primarily based on desk research, using the publicly available datasets, the national legislation and strategies, but it also builds on scientific evaluations and the own direct research and consultancy experiences of the authors. The document also relies on inputs from the first Policy Lab implemented on the 1 of April 2025, which event brought together a diverse group of stakeholders among them policy experts and national and local level policy implementers. In order to fill in the knowledge gap after the desk research phase and include the field experiences of planners and practitioners, national and local level expert interviews were carried out in May-June 2025. (The detailed list of interviews can be found in Annex 3).

The major limitation for the study is the fact that the housing inequality aspects of green investments is not a topic that is highly discussed in the scientific and policy community. Consequently, there are no studies available that the authors could rely on, rather the research framework had to be developed from scratch in the ReHousIn project.

3 Main socio-economic characteristics and governance structures

Hungary has a population of 9.6 million people, out of which 70% lives in cities – including 1.7 million people in Budapest. Hungary's population has been declining since 1980. Natural increase has been negative since 1981, 0.3-0.5% per year. Within the country, there is a strong migration of population to abroad (about 4% of the inhabitants with Hungarian nationality live in other EU countries, and another 1-1.5% may commute every day crossborder). According to the statistics, from 2016 the outmigration of people with Hungarian nationality is counteracted by people coming back from abroad. In addition there is a slight immigration from other countries, that consist of a rather short term labour force under regulated conditions[1]. Additional migration can be experienced inside the country to certain urban centres, resulting in a significant decline in rural areas.

As Figure 1 shows, real increase of population can only be experienced in the agglomeration of a few urban growth poles (like Budapest, Győr, Debrecen, Szeged) and in settlements around the lake Balaton.

[1] https://www.oeconomus.hu/irasok/a-munkaero-aramlas-20-eve-magyarorszagon-es-az-eu-ban/

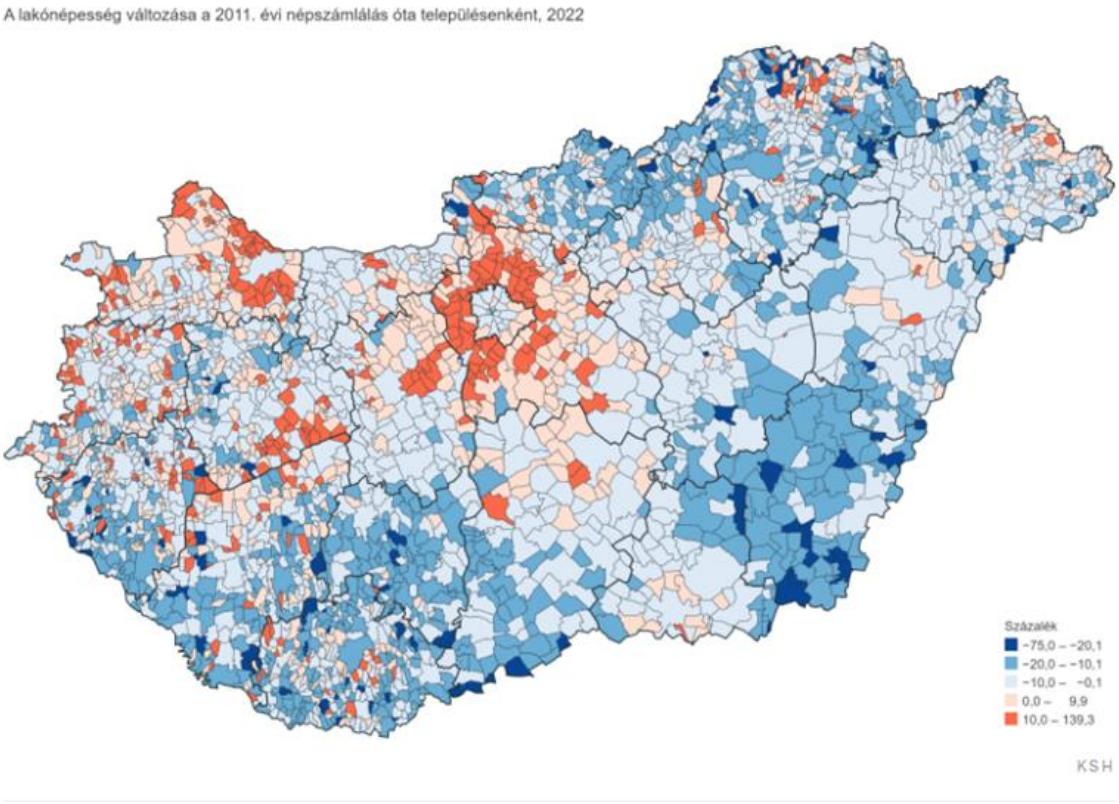

Figure HU1. Change of population in all the settlements of Hungary between 2011-2022

The consequence of this overall demographic decline and selective growth of urban agglomerations is that the pressure on the urban housing market is much smaller than that of the urban centres of most parts of Europe. It has an impact on the lower relevance of densification and green gentrification in general. On the other hand it is important to mention that the highest growth rate of real estate prices between 2015 and 2024 could be experienced in Hungary (especially in Budapest) among the European countries. According to the Eurostat[2], the price of average units increased by 198% as opposed to the 47% European average. This price growth however does not strictly come from the increase of the population (as it is officially decreasing), but rather from financialisation - growing share of short term rentals mostly in Budapest- the high inflation rates and demand side subsidies of the government against the decreasing supply.

Regarding the country's housing stock, an increasing trend can be seen in the number of dwellings, reaching 4,586,000 by 2023. In 2022 (census) about 2.4% of the whole dwelling stock was municipally owned, the rest was privately owned, and the rate is ever decreasing. While the rate of owner occupation is very high, the respective population living in owner-occupied housing is 90%, while the remaining 10% are tenants, as was mentioned, 2.4% in municipal housing and 7.6% in private rental dwellings (Central Statistical Office, 2023).

[2] https://telex.hu/valasztasi-foldrajz/2024/11/11/legmagasabb-ingatlanar-emelkedes-europai-orszagok-magyarorszag-terkep

Although this tenure structure has been favoured by most governments and their housing policies since the changing of the system in 1989/90, in recent years an even further push for homeownership can be seen by the government. Not only ownership is heavily favoured by the current policy environment, but it is also specifically the ownership of single-family homes that has been preferred.

In 2011, 62% of the housing units were in single-family homes (buildings with 1-3 apartments), and 38% of the flats were in multi-family homes (buildings over 3 apartments) in Hungary. This division is substantially different in cities, e.g. in Budapest 16% of the apartments are in single-family homes while 84% in multi-family buildings (Census 2022).

Housing and green policies are implemented in a multi-level governance system. The transition from the socialist system before 1990 resulted in a strongly decentralised new governance method, in which local municipalities gained high competencies. The decade following the financial crisis however can be characterised by new governance approaches, most of which can be labelled as 'centralisation' and "deconcentration". Local municipalities have lost most of their competencies in the field of education, health, social policy, and also competencies as authorities in various fields e.g. construction, foster care. In the 2000s NUTS 2 regions (there were seven of which in Hungary, and currently there are eight with the split of the Central-Hungarian Region into two) obtained important roles in the distribution of EU funds, which function was centralised also in the 2010s. Regions recently have only a statistical role. Strategic planning was delegated to the 19 counties of Hungary, which have practically no competencies in any other public issues. The central government functions are deconcentrated into 174 territorial units (called "járás")[3] where most of the every-day issues are handled such as obtaining documents or applying for unemployment benefit.

The share of Hungarian subnational government expenditure in total government expenditure (12.5%) was significantly below the OECD average (36.6%) in 2020, and decreased since then. Using Covid as a new argument, the central state imposed new taxes on urban centres (so-called solidarity tax) which further decreased the room of maneuver local municipalities have and made them more dependent on central resources.

The division of roles in a multi-level governance perspective regarding the main themes of ReHousin can be seen by the following table.

	Housing	**Housing retrofitting**	**NBS**	**Densification**
National Parliament	Annual national budget Housing law	National climate and renovation strategies Laws on climate change and energy efficiency	National environmental strategies	Framework laws in spatial and urban planning, architecture, environment, etc. National spatial development plans

[3] „Járás" is equal to the aggregation of local municipalities with regard to governmental functions, and includes 20-50,000 people in rural areas, and 100-200,000 people in urban centres.

				Spatial development plans of priority regions
National government	Decrees on state level housing subsidies and programmes	Decrees on technical standards of retrofitting and new construction Decrees on subsidies for retrofitting	Governmental decrees on the role of municipalities in green investments	Governmental decrees governing details and implementation Direct government of "national priority projects"
Regional level	*Until 2010 regional authorities planned and distributed EU funds dedicated to regional levels*			
County level			Spatial development plans	Spatial development plans
Microregions (deconcentrated governmental authorities - járás)			Construction authority	Construction authority
Local municipalities	Local decrees on housing allowances Management of the municipal housing stock	Local renovation subsidy schemes Local regulations on heritage protection	Local building codes	Local spatial plans and building codes

Table HU1. General role of different governance layers with regard to housing and green policies

4 Housing retrofitting

In 2020, 34% of all primary energy went to residential buildings in Hungary. 71% of all energy used in residential buildings was used for heating. Regarding heating, 52% of the energy used for heating came from natural gas, 22% from renewable sources (mostly firewood), electricity was used in 18% of the cases and district heating is responsible for 8% of the energy use in the residential heating sector (Tóth, et al., 2023).

According to the Odysee-Mure database **Hungary has the second highest energy need for heating concerning the residential building stock in the European Union.** In general, the energy need for heating per square meter in residential buildings has decreased in the European Union from 2000-2021 by 25.9%, while it has decreased only by 4.8% in Hungary.

There are different statistics with regard to the results achieved concerning the renovation process. According to the Census of 2022, about ⅓ of the Hungarian housing stock has some additional external insulation, while also about ⅓ of the housing units have an air-conditioner (this rate is increasing fast lately due to the extreme hot summers in Hungary)

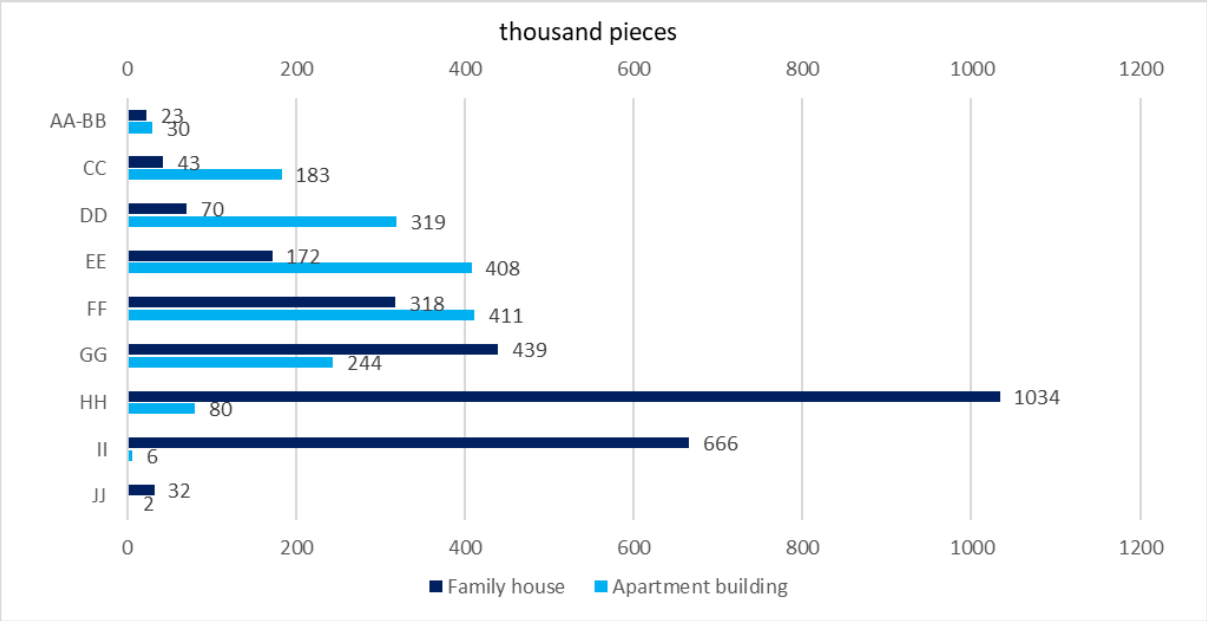

Figure HU2. Composition of the Hungarian housing stock based on their calculated energy consumption (certification)

Source: Bene et al. 2023

As the figure above shows, the worst performing building stock consists of mostly family houses, while multi-family buildings in general have higher standards. As opposed to the common belief on the Eastern European panel housing stock, these pre-fabricated buildings have higher than average energy standards, while family houses of the 1950s and 1960s that were built in high numbers based on unified architectural plans, have much worse energy parameters.

According to the basement report by Price Waterhouse in 2023 about 80% of the Hungarian housing stock needs a refurbishment, which would mean 3 million dwellings by 2050. For this, about 3.2% of the stock should be renovated each year - about 120.000 dwellings per year - instead of the current 0.5-1%. The renovation cost is predicted to be about 150-250 Euro/m2, resulting in about 59 billion Euros all together. Comparing the proposed number of units to be renovated annually with the currently running only one subsidy scheme with the target of 20,000 units to be completed in years (exclusively family houses), we can evaluate the challenge of the task.

On the other hand, as regards the short term goals set by the recast of the Energy Performance of Buildings Directive, to reduce the primary energy consumption of residential buildings by 16% till 2030, it is easier to reach. For this the ultimate tool is not only the renovation but the reduction of consumption. E.g. from June 2022 to February 2024 the gas consumption of residential buildings decreased by 24% as a result of increasing gas prices for households whose consumption exceeded a certain threshold level.

4.1 The policy cycle: emergence of the issue and policy decisions

The policy considerations around the energy efficient renovation of the residential stock can be seen from two major angles: 1) renovation as the physical improvement of the stock and 2) energy and climate considerations as one of the attributes of renovation. The two considerations do not necessarily go hand in hand as buildings have generic refurbishment needs and also energy improvement needs.

The physical improvement of the stock was predominantly conceptualised as part of the demographic policy of the government from 2020. Subsidies for renovation of multi-family dwellings and family houses could be obtained in case the family had (or promised to have) children and met some minimum social criteria (having social security, being credible for loans) The largest subsidy schemes with regard to supporting the refurbishment of the building stock were (and are still) tied to these demographic policies.

Regional policy also has a relevance in supporting building renovation. There are renovation subsidies for families with children or most recently for pensioners, that have a special spatial target to settlements below 5000 residents that are also losing population. Thus building refurbishment is encouraged to counteract rural decline.

There is another policy aspect of supporting the renovation of residential buildings, that have a focus on multi-family buildings. Interest rate subsidy for the renovation of condominiums and cooperatives has existed since 1988. The 1980s was the decade when the construction of private cooperatives and condominiums accelerated (in parallel with the enlargement of the state owned rental stock). The relevance of private management of multi-family buildings has strengthened from 1994, when the large scale privatisation process started. This process transferred the ownership of hundreds of thousands of multi-family units from public to private hands, to the sitting tenants, thus creating ten thousands of new condominiums. The state-financed interest rate subsidy (however was not very relevant in scale) was promoted as a tool to help the new communities to finance the renovation process.

In the subsidy schemes mentioned above energy efficiency was not a factor for consideration, however it was not excluded either.

Energy efficiency in the residential sector became an important attribute in 2000, when the decree on housing subsidies was elaborated (12/2001 Government Decree on housing subsidies). The new housing decree entering into force in 2001 contained a new subsidy scheme that provided ⅓ of the renovation costs by the state and ⅓ was required from the local municipalities for the energy efficient renovation of buildings built by industrialised technology. That time the focus was on the industrialised stock as was the case in the neighbouring post-socialist countries. The financial crisis terminated the subsidy system that was once reborn in 2015 for one call. Since then no non-repayable subsidies were provided for multi-family buildings.

The emphasis was step by step transferred to the family housing stock. There might be several reasons behind this. The Long Term Renovation Strategy of Hungary (2021) and the technical surveys behind have shown that **family houses in general have much worse energy efficiency conditions than that of multi-family buildings** and many of them can be

renovated in a more cost-efficient way. In addition, the funds used by family houses are easier to spend as the decisions for renovation are much simpler than in multi-family buildings where at least a majority decision is needed in a General Assembly. This simplicity of decision as an argument for family houses when funds have to be used up in a short time period, is reasonable.

The emphasis towards family houses was manifested in the fact that certain subsidy types (e.g. interest free loan between 2017-2022, subsidies for solar panels) were practically accessible only by them. (Sharing energy coming from solar panels in multi-family buildings is still not legally possible in Hungary, however the legislation is about to change.) The most recent grant scheme that started in July 2024 also addresses only family houses, with ringfenced amounts for Budapest and the other regions.

Subsidies currently do not play a major role in financing energy efficient interventions - except for about 20.000 family houses. According to the Long Term Renovation Strategy of Hungary (2021) the major financial tool is the Energy Obligation Scheme that started in 2021, **thus the government plans to strengthen the private market as opposed to the use of public funds**.

The EU accession had an impact on the energy efficient refurbishment of the urban (and the rural) residential building stock through two major channels: through subsidies and through legislation.

In case of subsidies we can state, that the first waves of subsidies came from the state budget (2001-2009), then from selling CO2 quotas (in 2015), while the interest rate subsidy (2017-2022), the solar panel subsidies (2021-2024) and the latest call from 2024 are financed primarily from EU funds.

The major source of EU funding currently in Europe is the Recovery and Resilience Facility, for which Hungary is not yet eligible.[4] The European Union as a source of financing is considered a benefit in the Central-European Region on the one hand, but also as a set of highly bureaucratized criteria that have to be included into the national calls on the other.

European funds were accessible for housing purposes in the 2007-2013 budgetary period for the first time, but the very first wave of them were not focusing specifically on energy efficiency but on housing in marginalised areas. Housing had to be part of a complex intervention that contained physical and social elements as well. The physical elements included the renovation of public spaces, public buildings but also the energy efficient renovation of the publicly owned and privately owned housing. These programmes (so-called social rehabilitations in Hungary) were the first ones that resulted in completely renovated panel buildings from EU funds in Budapest and also in some other major cities of Hungary.

In parallel with the founding streams the technical legislations have also gained relevance. (The transposition of the European legislation can be followed by the information

[4] Hungary got less than 1 billion Euros as a prepayment from RRF as opposed to the 9.7 billion Euros dedicated to this fund in the country. In addition, this amount may also be withdrawn by the EU in case certain conditionality criteria is not met. The remaining funds can not be accessed either in case some changes in the educational, jurisdictional and media legislations are not changed.

set provided in Annex 2). The main directives (Energy Performance of Buildings Directive, Energy Efficiency Directive) were transposed to the Hungarian legislation in the form of ministerial decrees. The most relevant from them was the 7/2006 TNM decree, which has changed time to time, following the changes in the EU legislation and concluding to the most recent 9/2023 ÉKM decree. These decrees contained the conditions under which new construction, major renovations and energy certification should be implemented. These conditions were tightening gradually aiming to reach the cost-efficient technical parameters of renovation. As an example, based on the most recent recast of the EPBD (spring 2024) the instalment of fossil fuel stand alone boilers should not be subsidized anymore in the current subsidy calls. Interestingly enough, sometimes the Hungarian requirements for building renovations are much more strict than the requirements of the EU legislation. E.g. while the EPBD of 2002, 2010 and also the latest recast says that "Member States shall take the necessary measures to ensure that when buildings undergo major renovation[5], the energy performance of the building or the renovated part thereof is upgraded in order to meet minimum energy performance requirements set in accordance with Article 4 in so far as this is technically, functionally and economically feasible.... Those requirements shall be applied to the renovated building or building unit as a whole. Additionally or alternatively, requirements may be applied to the renovated building elements....Member States shall in addition take the necessary measures to ensure that when a building element that forms part of the building envelope and has a significant impact on the energy performance of the building envelope, is retrofitted or replaced, the energy performance of the building element meets minimum energy performance requirements in so far as this is technically, functionally and economically feasible." In the Hungarian legislation the energy standards in case of major renovation can not only be applied to the renovated part (e.g. facade) alone, but to the whole building, thus buildings undergoing major renovation have to make additional investments in order to reduce their energy consumption below 110-150 kWh/m2/year. This standard requires high investments for many buildings, which hinders the implementation of a step-by-step renovation. On the other hand it is important to note, that even if meeting the obligations of the government decrees is legally binding for the implementers of the renovation, neither the state itself nor the local municipalities and the housing owners follow the rules properly. As the technical standards are set too high, state subsidy programmes, local subsidy programmes and private renovation interventions tend not to follow them and due to the shortage of human resources to check the requirements, the avoidance of laws remain uncovered.

There are no specific requirements with regard to social housing and there are no minimum energy performance requirements introduced for housing either.

With regard to energy poverty, in case we apply some common indicators used in the European Union, we can see, that Hungary has an average position compared to the other EU member states, e.g. having 8.7% of the population not being able to warm up their homes, or 7.3% is declared to have arrears in paying utility bills - EU SILC 2023. As regards the strategy around energy poverty, we can state that Hungary is still at the starting point. It is compulsory to work out a definition on energy poverty at the National Energy and Climate plan, but even in the latest version (2024), the definition is quite vague: "Vulnerable customers/households are those, who have difficulties in securing the basic energy needs of their flat. The term

[5] Major renovations are those that affect at least 25% of the building envelope.

includes the financial difficulties to pay for energy as well as the high energy consumption of the property." The Low on Energy Efficiency (57/2015) states, that "households that need support are those, whose costs to heat their apartment up to 20 C and make warm water exceeds 25% of their household income, taking into account the average income and costs from 2020." Despite these definitions, no concrete action for eliminating energy poverty is elaborated yet. There is a common state consideration, that as the energy prices are capped in Hungary for the households up to a certain consumption level, consumers are protected and energy poverty is a negligible issue.

The elaboration of the Social Climate Plan, which should theoretically be submitted by June 30 2025 to the European Commission, is in a conceptualisation phase, with no clear target groups and toolkit defined yet. In addition, a government decision was made in May 2025, that Hungary is not joining the Emission Trading System 2, not risking the political gains of the energy price capping system. Consequently Hungary will not be eligible for the Social Climate Fund, thus even if the Social Climate Plan will be developed in autumn 2025, it is not likely to be implemented due to the lack of resources.

The National Building Renovation Plan (the draft of which should be submitted in December 2025), is not conceptualised yet by mid-2025, despite the fact that most of the transposition of the EPBD and EED of 2024 is fulfilled with the statements of this document (e.g. how to make preference for the worst performing building stock, how to make preference for the energy poor households, how to introduce renovation roadmaps or how to reach 16% primary energy savings in the housing stock by 2030).

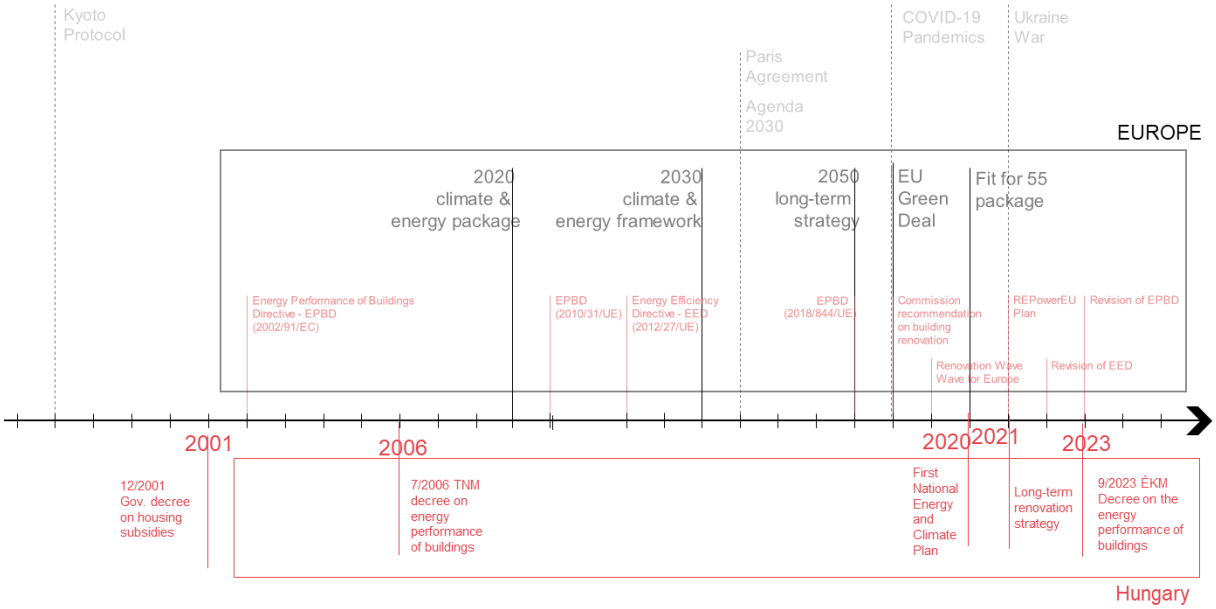

Figure HU3. Timeline of strategic documents in retrofitting

The strategic foundation of energy efficient renovation of the housing stock is not properly set in the strategic documents and the transposition of the latest EU directives are strongly lagging behind. (The transposition of the former directives were also completed far beyond the deadlines.) The most efficient transposition was made with regard to the technical

requirements for new construction and major renovation of housing, however these requirements - even if they are binding - are not properly implemented due to the lack of enforcement.

4.2 The implementation process

As was described in the previous chapter, the strategic background of energy efficient renovation of the housing stock is not properly set, except for the technical obligations for new construction and major renovation.

The subsidy programmes for supporting the renovation of the housing stock can be split into two major categories (like the policies themselves): 1) the ones inspired by demographic and regional development considerations and 2) the ones inspired by energy efficiency goals.

Nearly all the support programmes concentrated on the privately owned housing stock aiming to assist families to renovate their properties.

CSOK programmes (CSOK: Support for housing for families in Hungarian), reborn in 2015 after a termination due to the financial crisis, primarily aimed to assist families with children to buy new or older housing units. From 2019 the renovation of these newly purchased units were made eligible in small settlements. The programme went through some smaller changes, and in its current state it is only available in villages (all together in 2630 settlements, that have less than 5000 inhabitants). Families with children are eligible for a grant, which is 600,000 HUF (appr. 1,500 Euro) in case of one child, 2,600,000 HUF (approx. 6,500 Euro) for two children, while for 3 children or above 10,000,000 HUF (25,000 Euro). Only those families are eligible, who have a household income that exceeds certain thresholds (e.g.over 500,000 HUF - approx. 1,250 Euro in case of 2 children). These thresholds exclude families living below the poverty line.

A specific renovation programme existed in 2021 and 2022 being targeted to families raising at least one child, and provided a grant of 50% of the renovation costs of family houses or apartments up to 3 million HUF (approx. 7,500 EUR) retroactively. As the grant is paid after the renovation is completed, the state also introduced a state supported loan - 3% interest rate - to help the households to pre-finance the interventions. The programme started in January 2021 and ran till December 2022. 770 billion HUF (approx. 2.2 billion EUR) was spent on the programme, and about 380,000 households benefited from it. Thus this programme was far the largest renovation scheme in the last decades. However, since the programme's scope was not strictly energy efficiency, no criteria was set about the potential energy saving or energy rating improvement as a result of the renovations.

The programme was terminated in December 2022 and reborn in the form of a Rural Home Renovation scheme in January 2025. The subsidy is now available for renovation only in settlements below 5000 inhabitants (with a serious overlap with the CSOK programmes). The subsidy consists of a grant (up to 3 million HUF - appr. 7,500 Euro) for families with children and a favourable loan up to 6 million HUF - appr. 15.000 Euro. The renovation can include all the necessary interventions including the energy efficient ones.

There were several smaller and bigger programmes supporting specifically the residential energy efficiency in Hungary in the last two decades, that affected at least 400-450,000 households. Hungary was one of the first countries to start with energy efficiency investment programmes.

The first programme supporting the energy efficient renovations of multi-family buildings started in 2001 in Hungary. It was the so-called Panel Programme. It targeted multi-family buildings built with industrialised technology, including the panel buildings, but not exclusively them. This programme required ⅓ self financing, and the rest was covered by the state (⅓) and the municipality (⅓). The programme lasted until 2009 when it was terminated due to the financial crisis.

The next bigger renovation programme started in 2015, as part of a general energy efficiency renovation programme called 'Warmth of the Home'. This programme covered up to 50% of the costs, however the final subsidy was calculated based on the kgs of CO2 saved.The programme targeted multi-family buildings (of any kind) with 4-60 dwellings.

These programmes were very popular. This is demonstrated by the short call in 2015, when the budget was used up in a few days. From a technical point of view the requirements became stricter and more complex. In 2015 the buildings had to have energy audits as part of the application and as a result of the interventions had to meet the complex energy standards set in a government decree (7/2006 TNM decree).

After a significant break, in the 2014-2020 EU programming period, another programme started that targeted both single- and multi-family buildings. It was financed by the Economic Development and Innovation Operational Programme and the Competitive Central Hungary Operational Programme in Budapest and Pest county, and it provided interest free loans for beneficiaries to renovate their homes and make them more energy efficient. This programme required 10% own-share. For the Cohesion regions (all regions of Hungary except for the Central Hungarian) at least 75% of the funds had to be spent on family houses, while this threshold was 50% in and around Budapest. In reality however, there were very few multi-family buildings that could cope with the requirements of the subsidy scheme, thus practically it was used for installing solar panels on family houses.

In 2021, as part of the Recovery and Resilience Facility, later transfered to Structural Funds, a programme for installing residential solar panels on single-family homes' roofs started. The programme provided 100% non-refundable grants for beneficiaries and appeared again in 2024 in the form of a 66% subsidy with the requirement to install household batteries as well. This very advantageous situation can question the necessity of public subsidies for solar panels. However, the new gross based billing procedure from 2024, yet again alters the situation.

On 1 July 2024 a new Home Renovation programme started for the energy efficient renovation of single family homes as part of the REPowerEU agenda. The whole budget of the programme is 108 billion HUF (approx. 280 million EUR), and it is planned that it will contribute to the renovation of at least 18,000 family houses built before 1990 (later extended to family houses built before 2007). The programme is a mix of a non-refundable grant and a subsidised loan.

In 2024 the amount of the grant depended on the income and location of the beneficiaries. However, from January 2025 this income sensitivity was terminated. The grant's amount varies between 2.5 million HUF to 3.5 million HUF (6,250 EUR to 8,750 EUR) based on these indicators. The rest, up to 2.5-3.5 million HUF, is covered by an interest free loan instrument that serves as the basic funding of the programme and can be taken out from the selected commercial banks, and have a 12 years duration. The grant acts like a bonus: the whole amount (6 million HUF) has to be taken as a loan, and the grant part is paid in case the energy audit shows that the minimum amount of energy is saved. (This minimum requirement is 30%.)

Besides these specific renovation subsidy schemes the Housing Savings schemes were complementary funding sources. These schemes had a saving part, which contained a state subsidy up to 30%, and a favourable loan part. The state subsidy was terminated in 2018, but till that time it was a useful complement to other housing subsidies both for individuals and condominiums.

Condominiums and cooperatives financed their investments (besides the grants at the time they existed) from preferential loans that operated since 1988. The loan has a 70% interest rate subsidy content in the first 5 years, while a 35% interest rate subsidy in the next 5 years.

Several condominiums and a few social housing blocks were renovated throughout the country by means of the so called "social rehabilitation programmes" starting from the 2007-2014 EU programming period. This was the first time when the European Union made housing interventions eligible for European subsidies with the condition that they are implemented in the framework of complex interventions covering both infrastructural and social elements. Areas struggling with social deprivation were eligible for such interventions. In these areas privately owned condominium and cooperative buildings could have been renovated, first with 75, then with 100% subsidy rates. Social housing complexes were also eligible, but as there is a very limited number of purely publicly owned housing complexes, and most of them are in Budapest and the bigger cities, this programme had limited impact on the social housing sector. Outside of this specific programme, social housing has been excluded from state subsidies and the renovation of this stock purely relies on the constantly reducing local funds.

Besides the rather restricted financial schemes there is not much the public sphere offers to support the renovation process. One-stop-shops or other renovation agencies are practically non-existent in Hungary (except for some EU funded pilots).

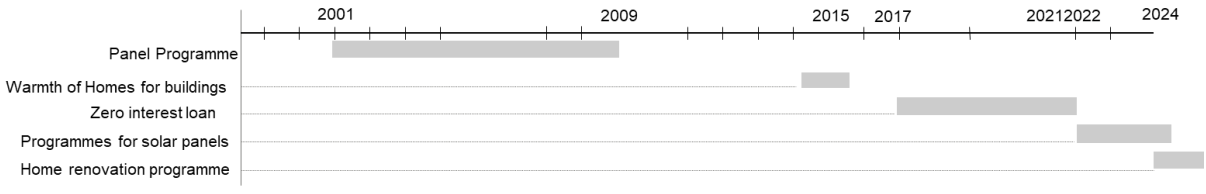

Figure HU4. Specific energy efficiency subsidy programmes in Hungary

4.3 Size and role of the market

There are about 4.5 million housing units in Hungary. It contains about 80.000 multi-family buildings and 2.7 million family houses. About 80% of them would need substantial renovation. The cost of the renovation is estimated to be about 59 billion Euro. This is an enormous market for the construction industry in Hungary, still, the renovation rate is well below 1%. **There are several impediments for the market to grow properly.**

- **The first and most important is that the energy prices (gas and electricity) have been capped since 2013 in Hungary for the households** (the extra costs are paid however by the non-residential consumers). Due to this price cap, the household electricity prices and gas prices in Hungary are practically the lowest in the EU as can be seen on the following figures.

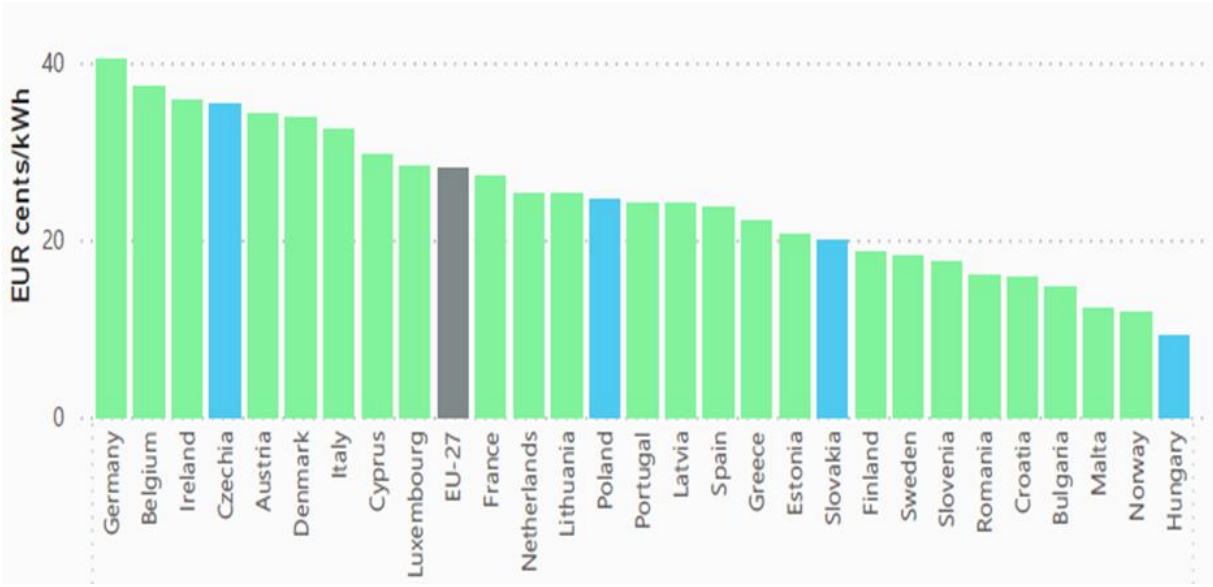

Figure HU5. Household electricity prices - April 2025

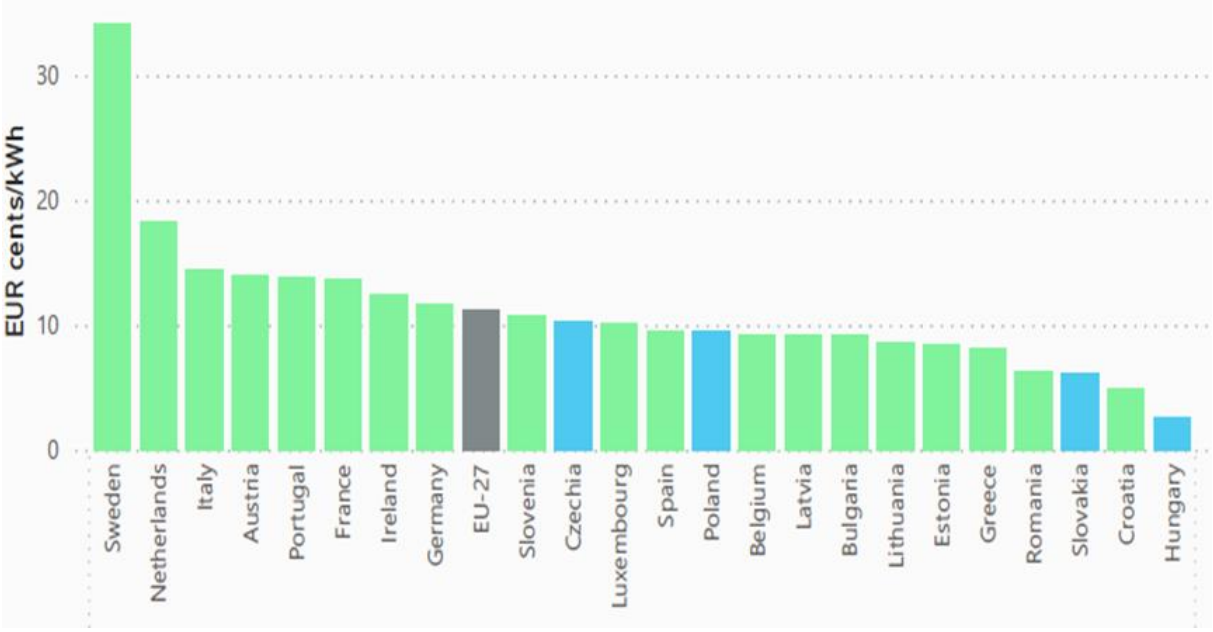

Figure HU6. Household gas prices - April 2025

Source: ACER based on data from VaasaETT, presented by Csilla Bartók in June 2025

- The price cap was partially released in August 2022. From that date the price cap remained up to a certain consumption level (2,520 kWh/year in case of electricity; 1,729 m3/year in case of natural gas), while above that the price became about seven times more in the case of natural gas and about two times more in the case of electricity. District heating is completely exempt from the modification in capping. About 20% of the family houses are affected by the change of the capping of prices, while apartments in multi-family buildings hardly experienced any effects. Under this price capping scheme the pay-off of a deep renovation takes several decades, which is not covered by financial schemes with the duration of decades. Consequently the motivation for energy efficient renovation can not be based on strict financial considerations, and this is why market based interventions like the involvement of Energy Savings Contracts or on-bill financing cannot be used in the residential sector.
- **The state subsidy system is very volatile.** Sometimes schemes appear with a 100% subsidy content, then there is no subsidy available for years, then interest rate subsidies are launched, followed by a combination of grant and loan for special target groups. Under these circumstances the market operates on a very low level without subsidies (property owners are waiting for a new subsidy to come) and the prices become skyrocketing when a new scheme is launched. Thus subsidies are internalised by the market actors, but the final beneficiaries experience low real subsidy rates (coupled with high administrative requirements).

There are however some positive factors as well, that can accelerate the market:

- There is a new financial tool introduced to the market, namely the **Energy Efficiency Obligation Scheme**, since January 2021, which has already brought some results. Service providers, who sell electricity on the grid, natural gas or fuel, have to reach energy savings in their final consumers up to 0.05%of their energy sold in 2021. This compulsory energy saving share increased to 0.5% in 2024 and remains the same each year till 2030. Energy companies may implement the energy efficiency measures themselves, or can buy "Certified Energy Savings" either directly from certified auditors or from a specific stock exchange of CES. In case the obligatory energy saving is not reached, then a certain amount of penalty has to be paid. (Thus the highest price for a certain amount of energy savings at the market is the amount of the penalty.) The current amount of energy saved in the system is 17 PJ/year [6]. According to the experiences of the last years, most of the energy saving measures were implemented in the transportation and in the industrial sector. Housing was not amongst the lower hanging fruits except for one intervention: the insulation of the attic of family houses. In this specific case construction companies were the integrators that sold a package of insulation works to energy companies. By the scheme the intervention was nearly costless for the final beneficiaries. According to the calculations the energy efficiency obligation scheme can result in about 10-15% subsidy in case of a large-scale residential retrofitting project, which is not enough alone to make the renovation happen, but can potentially contribute to a more complex financial mix.
- **The market based finance for the renovation of multi-family buildings (cooperatives and condominiums) is well settled amongst commercial banks**. The Law on Condominiums and the Law on Cooperatives make it possible to get joint loans for the communities, based on a simple majority vote, without liens, just pledging the account of the home owners' associations. These commercial banking products were developed 20 years ago, and were very popular at the time of the Panel Programme, when they co-financed the state and municipal grants. They became less popular when these support programmes terminated, but are still running and reaching about 40-42 million Euro loan amount every year.
- The market is very reflexive to the state support programmes. It has its dark side, as was mentioned in the case of artificial price increases, but it has its bright side as well: market actors immediately developed their product linked to the subsidies, like making the preparation for the renovations, assisting the communities and preparing the tendering documentation.
- The recent market trends in the construction sector also favours renovation. In the last decade the sector was occupied by state constructions, which have collapsed due to the ban on European funds. For a decade one of the major bottlenecks of renovation was the lack of construction capacity. Recently there are free capacities that may be used for a new wave of renovations.

The current housing renovation market is very modest due to the shortage of financial incentives (both from price and subsidy sides). The new market however, which just opened

[6] According to the Hungarian Energy and Public Utility Regulatory Authority (https://enhat.mekh.hu/)

up, is the market of auditors. There are about 200-250 professional auditors whose service is required in the energy obligation schemes and in case of complex industrial energy projects (simple energy certificates do not require auditors). The association of auditors - led by bigger auditing firms - has a strong lobbying power to set the requirements for certified energy savings. There are associations for construction companies and solar panel installation companies as well, but it seems that even if their voice can be heard by a wider public, their interests are much less considered, or at least not in a renovation, rather in a new construction framework.

4.4 The multilevel governance process

As was mentioned previously, 97.6% of the housing stock is in private hands, and only 2.4% is owned by the municipalities. **Thus the energy efficient retrofitting is primarily a private task.** However, as the private owners do not have a market incentive due to the capped energy prices, and there are no obligations either with regard to the energy standards of housing units - except for the new construction - we can not expect that the renovation process will be implemented purely from private resources (even if the moderate renovation process that is currently going on is financed from the owners' resources). In order to accelerate the renovation process the **nation state has a primary role by setting the legislation and the provision of financial incentives.** As was described in the previous chapters, the state sets the technical standards for new construction and major renovation, and operates financial schemes like the interest rate subsidy for multi-unit buildings, grant scheme for family houses and energy efficiency obligation schemes with the involvement of the energy providers.

As was described before, regions do not have a relevance in Hungary (there are eight regions, but only for statistical purposes).

The local municipalities are victims of the centralisation process of the last 15 years, losing most of their resources and competencies. The small municipalities (villages and small towns) never had the technical and financial capacity to influence the renovation process. The bigger urban municipalities however were strong actors in the 2000s, when they co-financed the Panel Programme and also put a strong emphasis on informing the home owners' communities. In the last decades they have lost this role, while many of them developed their own subsidy schemes (either loans or grants) to support the renovation of private, mostly multi-family houses. These schemes are strongly limited in scope, due to the serious financial constraints these municipalities face.

There are some exceptions however, as the case of Ajka (the small town in the ReHousIn project) shows.

Local municipalities played an important role in implementing the social rehabilitation programmes that also included the renovation of publicly owned and privately owned housing units. These area based programmes were created by the local municipalities and these municipalities participated in EU financed tenders of the Regional Operational Programmes (2007-2013), and in the Territorial Operation Programmes (2014-2020; 2021-2027). Several housing estates and marginalised neighbourhoods with buildings of traditional technologies were renewed by this means.

As regards the municipal housing stock, these are the buildings in the worst physical state. There are no state programmes (besides the very limited social rehabilitation programmes from 2007 till 2020) to support the renovation of these buildings so it has to be financed purely from local resources. As public rents do not cover even the maintenance, the renovation of these buildings is hardly happening. Energy efficiency in these buildings is mostly a secondary issue, as these old - generally over 100 years - buildings suffer from serious structural deficiencies that have to be handled first.

Many of the municipal housing stock is in condominiums, in the form of separate flats in a mixed ownership building. Previously the local municipalities always voted for the renovation of the condominiums at the General Assembly and paid for their share. There is a new tendency however, that due to the lack of resources on municipal level, some municipalities tend to vote against the renovation in order to avoid extra payments. By this means the public sector starts to be the hindering factor in the renovation of private buildings.

The case of Ajka

Ajka is a small city in Western Hungary with 26,000 inhabitants. ⅔ of its housing stock consists of multi-family buildings mostly built by industrialised technology.

The municipality of Ajka played an active role in supporting the renovation of the multi-family buildings since the launch of the Panel Programme in 2001. It provided ⅓ of the renovation costs even at those times, when it was not compulsory and the homeowners' associations had the possibility to apply for funding directly to the state. Between 2003 and 2009 the municipality spent 677.7 million HUF to support the multi-family buildings, which affected 133 multi-family buildings out of the 231 buildings that are located in the town. The municipality also provided co-funding in the 2015 call (Warmth of Homes), when the municipal contribution was not at all requested. In addition, the municipality has run separate programmes to support buildings built by traditional (not industrialised) technology and also run a programme to finance non-energy related interventions. It also launched a large-scale renovation subsidy call in 2019 and also in 2024 from its own funds.

All together renovations with a total budget of 6.1 billion HUF were implemented in the town between 2003-2024, out of which the municipality provided 2.37 billion HUF. 87% of the multi-family buildings underwent either energy efficient or structural renovations.

The success of the municipality is based on a strong political commitment of the mayor for decades. This approach has advantages and disadvantages. The residents of Ajka could rely on the support of the municipality in a predictable way, and consequently for today nearly all multi-family buildings are renovated up to a certain extent. The price is paid by the municipality, which had to take substantial loans and made a preference towards multi-family buildings against e.g. public buildings. The municipality also defined its own preference regarding the technical content of the renovations: In case of co-financing the state subsidies the technical standards were set by the state. In the case of local schemes however the main goal was to make visual improvements of the buildings to improve the urban landscape, that is why painting of facades without insulation were implemented as well, and the energy efficient interventions were allowed to be realised on a lower standard.

Governance layer	Role in housing retrofitting
National Parliament	National Energy and Climate Plans; Long-term renovation strategy (the National Building Renovation Action Plan in the future); Social Climate Plan; Energy Efficiency Law; national subsidy schemes for energy retrofitting
National government	Decrees on technical standards of retrofitting and new construction (7/2006 TNM decree, 9/2023 ÉKM decree); 12/2001 government decree on housing subsidies
Regional level	*Until 2010 regional authorities planned and distributed EU funds dedicated to regional levels including the social rehabilitation programmes*
County level	No role
Microregions (deconcentrated governmental authorities)	No role
Local municipalities	Local subsidy schemes and information campaigns for the local communities; renovation of the public housing sector

Table HU2. Specific role of different governance layers with regard to housing retrofitting

4.5 Achievement, assessment and challenges

All together about 1.4 billion Euro state funds were used for supporting the energy efficient interventions in the residential sector (refurbishment plus instalment of solar panels). While about 2.2 billion HUF was spent on supporting the renovation of homes of families with children. This division has a time dimension as well: energy efficiency in refurbishment was a major issue in the 2000s, while demography became a leading component in the 2020s. Despite these - rather modest - financial tools the annual renovation rate is below 1%, while at least 3% would be required to reach the climate neutrality goals till 2050.

The ignorance of energy efficiency as an important issue with regard to the residential building stock has several reasons behind. The major cause is the lack of market incentives due to the cap on energy prices, which limits the participation of market actors, financial institutions and the property owners themselves. The other main cause is the lack of obligations and enforcement from the EU side. Even in the last recast of EPBD minimum energy standards were not specified for residential buildings, while only an aggregated goal was defined by saving 16% of the primary energy from 2020 till 2030, which will increase to 20-22% by 2035. These goals can be reached without serious interventions, e.g. by releasing part of the price caps alone resulting in a 24% decrease in gas consumption. In addition, Hungary tends not to take EU obligations much seriously and it even ignores the decisions of the European Court, thus one can not expect that even if an obligation exists (which does not in case of residential energy efficiency) the Hungarian government will keep it. This phenomenon is represented by the current decision of the Hungarian government on not implementing the Energy Trading System 2. It is also important to see that large scale energy efficient interventions in the building stock must lead to electrification of the heating systems in order to phase out fossil fuels, which challenges the current state of the grid. Thus not only is there a need for a huge

investment into buildings, but also as much should be invested into the electricity system. These, coupled with the ban on EU funds for Hungary, seems to be a challenging task to fulfill.

There is also an additional aspect of housing renovation that has to be noted. Interviews with property owners and property managers revealed that the investments into the housing stock, even if they contain energy efficient elements, are far not explained by energy and monetary savings aspects. There are four major causes behind the interventions: 1) the need for fixing some structural deficiency like leaking roof, damaged facade or broken heating appliance; 2) the increase of the comfort level - warmer/cooler home with less noise and dust; 3) improvement of the visual outlook of the building; 4) increase of the property value. Energy efficiency and savings on energy usually comes last for most of the owners, that is why energy efficient renovations were going on even utility prices were capped in periods when state or local subsidies were available.

There are practically no studies or scientific articles about the measured or potential impacts of the retrofitting processes on housing inequalities in Hungary. Gentrification, as a social phenomena, is discussed with regard to the complete redevelopment of certain urban quarters of Budapest (like in the case of the inner part of District IX, or the Corvin-quarter of District VIII). Patchwork renovation of the residential stock is not studied as a potential cause for gentrification. On the other hand there were attempts to calculate the impact of the energy certificates to the price of the residential units (Ertl et al., 2021). Due to difficulties with linking the database of certificates to the database of housing transactions only family houses were involved in the analysis. The results showed that higher energy level has an impact on real estate prices (if all other factors, like year of construction, size and state of the units are cleared), and better energy efficiency level leads to higher energy prices. On the other hand this connection can not be validated in the case of Budapest, where the location inside the city is much more relevant, than the energy efficiency category of the given unit.

Due to the lack of measured impacts and evaluated social consequences, the current research can only set hypotheses on the potential housing inequality outcomes of retrofitting policies, which hypothesis have to be validated in the course of the ReHousIn project. The following table summarises this set of hypotheses.

Housing inequality result (hypothesis)	**Mechanism resulting in housing inequalities**
Bottlenecks in accessing energy retrofitting	•Multi-family housing: not only money matters, but organisational deficiencies •Social housing: lack of financial and technical resources of local municipalities •Family houses: lack of access to existing subsidies due to financial and information deficiencies
Unintended consequences of retrofitting, like mould	Behavioural causes and technically non proper implementation (ventilation deficiencies)
Selective increase in property value	The increase is very much location dependent

Social rent increase	Renovation frequently goes hand in hand with rent/value increase that result in higher social rent categories
Private rent increase	No control on private rent setting
MFABs: potential crowding out effect	Homeowners have to finance the renovation and simple majority can decide which decision is obligatory for all owners

Table HU3. Potential housing inequality impacts of retrofitting policies

The housing inequality consequences of retrofitting policies have two major roots: 1) not being able to benefit from the existing subsidies and not being able to implement the renovation process and 2) being victims of the mostly unintended consequences of the renovation process.

As was mentioned earlier, the renovation is primarily led by state and local subsidies, and the time they were available, the renovation process accelerated significantly. Based on interviews with municipalities, housing managers and housing owners it was discovered that the lack of household funds was far not the most decisive factor for not being able to benefit from the existing subsidies. In the case of multi-family buildings, the more organised communities with ambitious managers were able to get use of the funds regardless of the financial state of the community. In the case of family houses financial capability matters more - as there is no cross-financing mechanism between households like in multi-family buildings - but technical and administrative literacy matters at least as much. The current subsidy scheme for the renovation of family houses excludes marginalised households not only due to their financial difficulties but also due to their inability to follow the administrative requirements.

In case the energy retrofitting is done (has been completed in the 2000s for industrialised residential buildings and lately for family houses) there are some unintended consequences that can be observed. It is a common fear and a complaint that the change of windows and insulation of the walls keeps moisture in the buildings which may create mould inside the rooms. As not all the new windows contain proper equipment for ventilation and people tend not to change their ventilation habits (not to open the windows frequently), mould can appear - despite the fact that proper insulation may be a tool for avoiding wetting and handling thermal bridges.

Energy efficient renovation may increase the value of properties. In the case of family houses this correlation was statistically proven. (Ert. et al. 2021). On the other hand the analysis also revealed that in the case of Budapest location matters more than energy performance, thus residential buildings with higher energy standards in a less prestigious location can be cheaper (in case all other factors are cleared) than technically worse buildings in a high end neighbourhood.

There is sporadic information on the impact of renovation on social rents. There are slightly different rent setting mechanisms in each municipality, but many of them apply a combination of rent setting factors, like location, comfort level and state of the building. As renovation has

an impact on some of these factors, the increase may be experienced. On the other hand, social rents are generally so low (5-15% of the market rents), that even with an increase affordability is less of an issue. (In addition, the social rental sector is marginal, thus a rent increase has a limited impact on the market.)

There is no information at all about the impact of renovation on private rents. Most of the private rental units are owned by private persons, who have a maximum of a few units for rent, located in condominium buildings or family houses. There are no studies available on the behaviour of these private landlords. It is probable that in case the renovation of the building requires additional contribution from the owner in the form of an increased maintenance and renovation fee (in case of multi-family buildings), then this additional cost is transferred to the tenant. On the other hand this may strongly depend on the price setting strategy: in case the rent is already set high, the owner may not have the chance to increase it further as it may lose its market potential. In this case the owner has to internalise the cost.

Finally, there is a hypothesis that energy efficient interventions may have a crowding-out effect. As the housing stock is practically privately owned, and it is enough to decide on the renovation with a simple majority of owners being present at the General Assembly of a Condominium or Cooperative, the minority of the owners have to contribute to the renovation even if they can not afford that. As the renovation cost is in general built in the operational and maintenance fee, this increase in the fee may result in accumulating arrears and being evicted at the end of a foreclosure process. There is no scientific evidence supporting this hypothesis, and the interviews of Metropolitan Research Institute in the past and in the course of the ReHousIn project so far did not support this idea either. It seems that the increase in the operational and maintenance costs is moderate and even if the Condominium and Cooperative Law requires a simple majority voting for the renovation, usually the financial institutions or the state/local programmes require a higher rate of approval, which reflects a more consensual decision of the community.

The housing inequality consequences of retrofitting policies are not yet measured and acknowledged in Hungary, consequently there are no systemic policies against them. Policies to mitigate energy poverty through energy efficiency interventions (to target retrofitting interventions to the poor or to help them co-finance the interventions) are practically non-existent.

5 Nature-Based solution

Nature-based Solutions (NbS) is an approach which uses or mimics natural processes to solve climate-related challenges for society. They aim to increase biodiversity and facilitate a sustainable co-existence of humankind and nature. NbS are being increasingly recognised at the international level for its potential benefits, as outlined in the European Green Deal (Wolf et al, 2021). Besides facilitating adaptation to climate risks, NbS can provide numerous co-benefits, such as improving and protecting natural resources which offer a healthy and liveable environment, even in cities. NbS is an ‘umbrella’ concept, covering concepts like green infrastructure, ecosystem services and natural capital. The systemic nature of NbS requires a

broad cooperation of sectors concerned in land and resource management and protection of ecosystems.

The use of NbS can be more cost-effective and create additional co-benefits compared to relying exclusively upon conventional infrastructure. Capital costs for NbS are generally lower than for conventional infrastructure, even though maintenance costs can be higher. A key advantage of NBS is to provide additional benefits compared to conventional infrastructure, such as reducing greenhouse gas emissions, promoting climate change adaptation, amenity and well-being benefits as well as supporting biodiversity. However, the benefits that can be gained from NbS are strongly influenced by the settlement context (OECD, 2023).

Negative environmental impacts of urbanization on the local climate and the water cycle become more apparent with the settlement size and density. While villages define agricultural and grey infrastructure damages as the most significant, flood-related issues and the urban heat island affect larger settlements. Climate and environmental risks are typically found where the green infrastructure network is incomplete or in poor condition, and only a low level of ecosystem services can be delivered.

Low-density areas are usually located in the outer zone of the settlements and have a close connection to the surrounding non-built areas. In Hungary, traditional land-use types and patterns are often still used but usually declining. Their green infrastructure ratio is high, characterized by mainly private gardens. The growing population with an urban lifestyle of low-density areas in metropolitan areas leads to spreading built-in and impervious areas. High-density urban areas can be typically described by a high ratio of impermeable surfaces, which, combined with low albedo and evaporation, and obstructed wind channels, result in Urban Heat Island (UHI) effect. For example, in Budapest, UHI was shown to cause a difference of 15°C between the surface temperatures of a green area and a dense urban housing area (Tatai et al, 2017).

The UN's World Health Organization has already recognized the state of play of urban green areas in health and well-being. Guidelines define a minimum of 9 square meters of accessible public green space per capita which should be provided within 15-minute-walk from one's home (Russo and Cirella, 2018).

The analysis showed that the average canopy cover of the urban areas is 15.7% in Hungary. On average, 75.8% of Hungary's urban area is covered by green spaces (65% in Budapest). The national average however, shows significant territorial differences. In many cities, county capitals or metropolitan districts this aggregate green area indicator is less than 50%. (The indicator is limited by the fact that it does not distinguish between public use or ownership, and therefore only indirectly refers to ecosystem services.) Ecosystem services of urban green infrastructure are basically at a very low level in all towns and cities - some waterfront or mountain towns show better indicators (Agrárminisztérium, 2021).

The environmental pressures and the distribution of green infrastructure shows that settlements with very low green infrastructure typically have to cope with multiplied environmental challenges, underlining the negative impacts of missing ecosystem services.

The most impacted are settlements of Central Hungary, the plains, and the agglomeration of bigger cities that have the lowest amount of accessible public urban green infrastructure.

As Hungary has a high vulnerability, climate change is aggravating existing socio-economic and environmental challenges, including flooding and drought, heatwaves and poor air quality. Due to Hungary's unique location in the Carpathian basin, most of its environmental and climate pressures are related to water management: 34% of the land is impacted by drought, 22.3% by flooding and 45% by waterlogging. Due to the history and the tradition of territorial development and landscape management, around 90% of ecosystems are in a deteriorated condition, according to the national database of habitats (Tanács, Fodor, 2021).

Intensifying heat waves are challenging for both small rural and urban settlements, large cities' urban heat island effect poses a risk to human health. Due to the high impervious surface ratio, pluvial and fluvial flooding pose a more significant problem for large cities. Settlements lacking green infrastructure, typically dense urban areas, are more vulnerable to environmental threats (Csizmadia et al. 2022).

5.1 The policy cycle: emergence of the issue and policy decisions

Most measures of NbS are not new in Hungary but a rediscovery and mainstreaming of traditional land-use, building or greening techniques and management tools, combined with modern technologies. Hungarian citizens have a rising awareness for climate change impacts and declining biodiversity. They would generally welcome NbS investments, nevertheless, the complex connections between ecosystem services and community health and well-being still remain unknown to the wider public (OECD, 2023).

At the national level, such as at the EU level, Nature-based Solutions (NbS) are closely aligned with biodiversity objectives and are initially integrated into various policy frameworks aimed at promoting protection and restoration of nature and climate change adaptation strategies. There are three major trends that could be detected:

- National policy derives directly from EU policies (e.g. Nature Protection Law is laid on Birds and Habitats Directives or National Adaptation Strategy on the EU's Climate Adaptation Strategy)
- National policy develops aligned with the EU policy (e.g. Nature Restoration Law of the EU (August 2024) and the National Green Infrastructure Plan (2022) and National Decree on Green Infrastructure (October 2024),
- National or local good practices and measures precede the international strategy (e.g. local measures to keep the urban canopy coverage, Governmental Decree on Tree Protection in 2008, Building Act of 1997 to keep the balance of biologically active surfaces by reforestation or rehabilitation.) At the local level, where climate challenges have been a problem for many decades, good practices and local measures have developed long before national or international action (e.g. actions in Kecskemét, Szeged, Districts in Budapest.)

See the timeline of the most relevant national policies in the European context below.

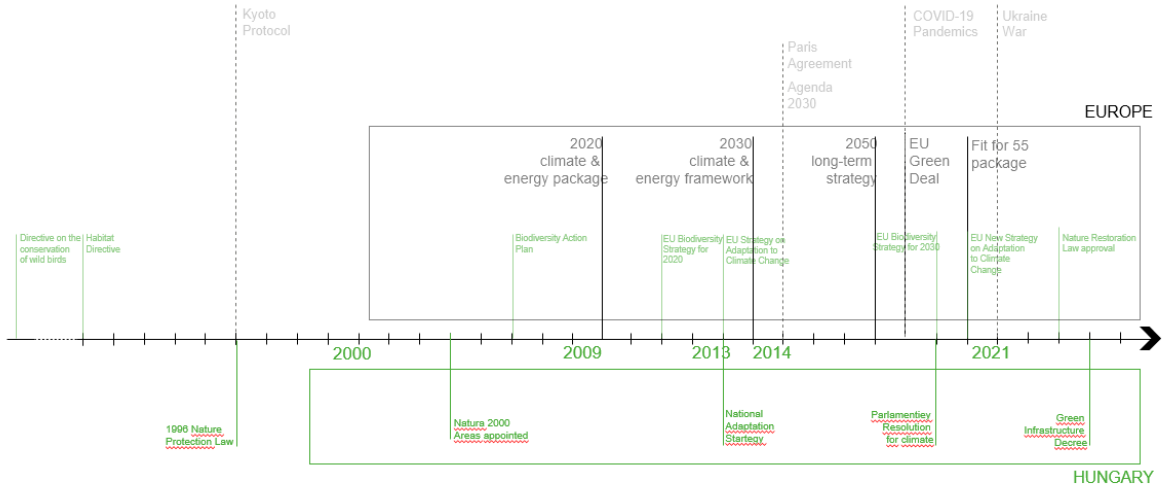

Figure HU7. The development of the policy framework for NbS in Hungary

Article P) of the Hungarian Constitution provides the regulatory cornerstone of NbS implementation: “Natural resources, in particularly arable land, forests and water resources, biodiversity, in particular native plant and animal species, and cultural values are the common heritage of the nation, which the state and all of us have a duty to protect, maintain and preserve for future generations.” These rights and obligations are to be enforced by the legal and institutional system, guided by the principles of subsidiarity, the right to a healthy environment and objective, regular information, and the active participation of society. **The current national policy environment does only partially support the use of these approaches.** The concept of NbS is reflected in several horizontal and sectoral policies and partially in regulations, but the regulatory environment for implementation and the institutional system is still under development and so called ‘fine tuning’.

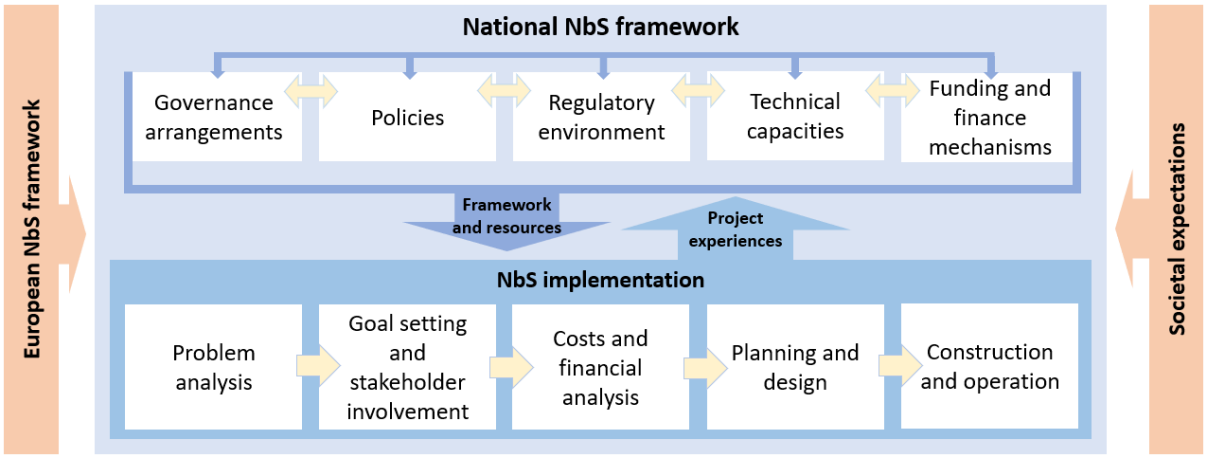

Figure HU8. Strategic and operational phases of implementation of NbS in Hungary, based on Csizmadia 2022

Due to growing environmental challenges, decision-makers are encouraged to find new ways to slow down climate change and adapt as well as to stop the loss of biodiversity. In a resolution, the Parliament (*18/2020. (VI. 4.) Parliamentary Resolution on non-deferral tasks arising from the scale of climate*, 2020) mandated the Government to ensure the necessary decisions on climate change-related effects, anticipation and adaptation, and the means of implementation. The resolution was followed by an intense national policy making period. More relevant national law will be formed later on to support NbS.

Nature protection and Natura 2000 areas in cities

Nature protection has a long tradition in Hungary dating back to the early 19th century and was institutionalized as early as 1919 when the list of protected birds and other animals was published. In 1935, by the adoption of the Forest Act, the first nature protection law act was announced and the National Nature Protection Council as an authority was set up. The first protected area, the Great Forest of Debrecen was legally acknowledged and sentenced in 1939. The country joined the international Ramsar Convention in 1979.

By 2000 the network of nationally acknowledged protected areas formed 8,8 % of the country's territory. For the period of accession to the European Union in 2004, Hungary had an established national framework of nature protection, led by the Ministry of Environment and Water, regulated by the *Decree of Nature Protection (1996.LIII.)* and managed through regional National Park Directorates, acting as authorities and managers as well. The law has set the idea of protection and development of ecosystem services. By 2021, 9,6 % of the territory was under nature protection in Hungary[7].

The Nature Protection Law has also set the framework of nature protection areas on local level, authorising local authorities to designate their own protected areas, which finally standardised the process and also set the measures of protection. These protected areas (parks, urban forests, wetlands, alleys, cemeteries, church gardens, etc. add up to 43 000 hectares in total) are smaller in size, better known by the locals, situated enclosed or at the boundaries of urban fabric which make them more exposed to townspeople. They are more significant in everyday life as a place of recreation and community gatherings. Locally protected areas are less than 0,5 % of the country's territory.

Hungary designated Natura 2000 sites in 2004[8], when it joined the European Union. On 13 November 2007, the European Commission adopted Decision 2008/26/EC, within the list of sites of Community importance for the Pannonian biogeographical region. The total area of Natura 2000 areas in Hungary is 1,994,980 hectares which of them are only 6,409 hectares

[7] https://ksh.hu/s/kiadvanyok/fenntarthato-fejlodes-indikatorai-2022/3-8#1-abra

[8] It was easy to designate the areas as almost all the areas were already under national or local nature protection.

lies in urban areas, less than 0,3 %[9]. These areas are more likely the highly populated, urbanized and frequented waterfronts (along the shores of Lake Balaton and the River Danube), boundary areas of settlements enclosed in or situated next to larger national park territories (Hortobágy, Bükk, Kőrös-Maros NPs, Zempléni Landscape Protection Zone etc.)

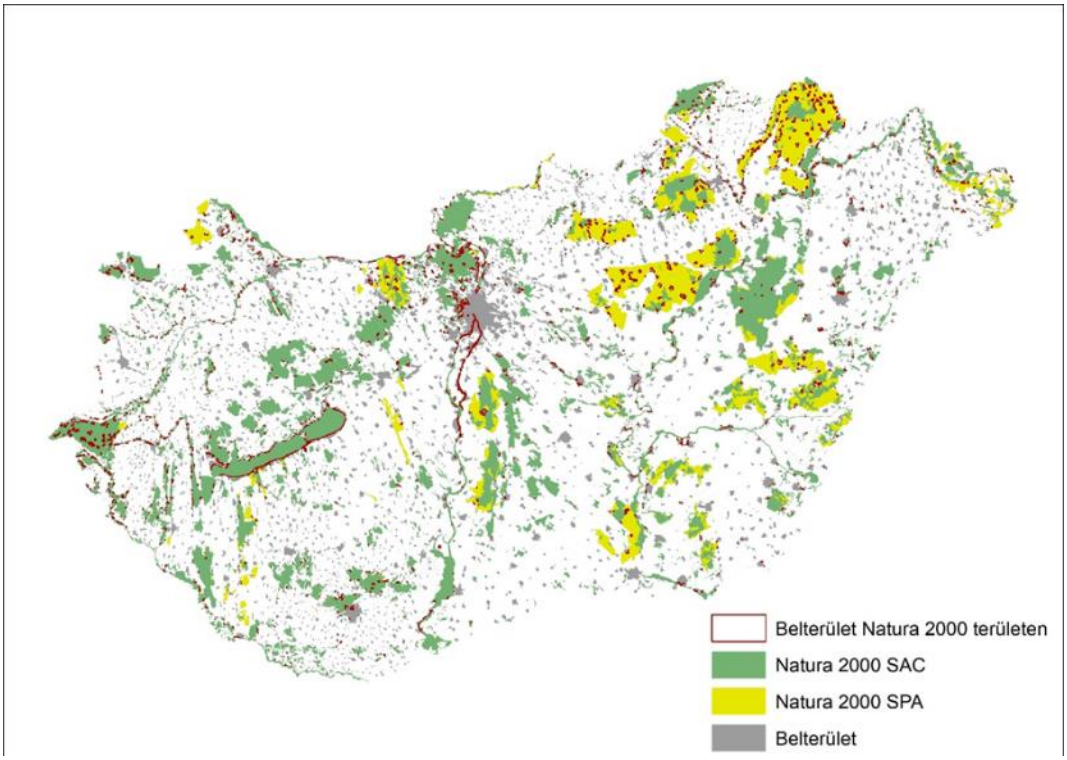

Figure HU9. The distribution of Natura 2000 territories all over the country (including urban areas in red)

Based on the Strategy on Adaptation to Climate Change (in 2013), national adaptation strategies and plans (NAS 1 and 2, ÉCST,) and free access databases (NATÉR) were developed, basically following the EU policy guidelines and requirements. Local authorities could apply for subsidies to develop their own local climate strategies and/or SECAPs. Operational programs required these local strategies among baseline documents or important milestones in order to obtain European funds. Dissemination and community involvement were also integrated in the process.

The importance of preserving biologically active surfaces and keep the balance in urban development occurred as a strong policy in the *Building Act of 1997*. New series of building codes were published in the last few years, which includes a clear definition of green infrastructure and national assets to preserve and develop it on an urban scale. C/*2023. Act on Hungarian Architecture* sets the principles that the natural environment and its network

[9] Natura 2000 területek - A magyar állami természetvédelem hivatalos honlapja

must be preserved and cannot be destroyed by building activity and urbanisation. It sets the preference of brownfield developments and the regulations to stop urban sprawl and green field developments. It announces urban green infrastructure as a tool to preserve natural resources and better adapt to climate. The *Government Decree No 280/2024 (30.IX.) on the Basic Regulation on Town Planning and Building Requirements* gives more specific guidelines and measures to define urban green spaces. It also sets the priorities of rainwater management and the forestation quotes for paved parking lots[10].

A significant milestone was the approval of the *Government Decree 282/2024 (IX. 30.) on municipal green infrastructure, green space certification and the green mark* which defines the planning, management and protection aspects of urban green infrastructure based on the approval of ecosystem services. The decree does not mention NbS but the defined tools and measures directly serve its implementation. The basis of compensation of vegetation due to building activity is based on the calculation of the biomass by the so-called 'green volume' (for the baseline and for the projected state), to ensure a balance of biologically active surfaces and canopy coverage, set as an indicator in the Nature Restoration Law. As the decree was announced recently, there is no experience of its implementation yet, but there are high hopes that the implementation of the decree will be an efficient tool to protect the urban green environment.

EU and national funding programs produced, as co-results, a series of handbooks and guidelines for NbS project development and implementation, in harmony with EU guidelines. *The Green Infrastructure Guidance* was published by the managing authority for Operational Programme for Spatial and Urban Development. A *Green Infrastructure Jury for Investments* within the operative programmes during the technical planning phase, was also set up to support NbS, also organized by the Managing Authority. A study package was developed for national project evaluators as well as for local project developers. The EC also provides NbS experts, contracted by EC, to evaluate and monitor the implementation of the EU policies in national operative programing to ensure the performance of NbS.

The definition of NbS has not yet appeared in the Hungarian regulatory system, but the concept of ecosystem services and green infrastructure (GI) supporting the network-based, coordinated planning of NbS is already present in several regional and technical documents.

5.2 The implementation processes

The ministries' current tasks and competencies include numerous areas relevant to the NbS implementation (e.g. environmental protection, nature protection, water management, urban development, urban management). As these tasks are divided among several ministries and governmental agencies, enhanced cross-sectoral coordination is highly required to scale up

[10] "The planting of trees to provide shade for the parking areas must be done by planting 1 large-canopy tree for every 6th parking place started, or 1 medium-canopy environmentally-tolerant, multiple-schooled deciduous tree for every 4th parking place".

the use of NbS. The dedicated leader of the NbS national policies is the Urban Development Department of the Ministry of Building and Transport[11].

The delegation of tasks and competencies of ministries and authorities frequently varies, hampering the cross-sectoral work and knowledge collection and sharing. Several relevant sectors have started to implement NbS in their fields, sometimes combined with organisational development (e.g., the Municipal Water Management Department of the National Water Directorate or the Green Infrastructure Jury of the Ministry of Building and Transport), but their objectives are not yet harmonised due to the lack of appropriate cross-sectoral cooperation.

There is often a lack of coherence between the different sectoral strategies related to NbS. The lack has hampered their implementation. The achievement of the objectives is hampered by a lack of clarity on funding sources and coordination between operational programmes. Several NbS-related national strategies have been prepared (in line with international strategies and guidelines) for

- climate change adaptation and mitigation tasks,
- stopping biodiversity loss,
- sparing water use at the river basin level and
- sustainable land use.

When NbS are included in national and local strategies, they typically do not have an exact executive task or target, which often leads to a sharp contrast between strategic objectives and implemented projects (e.g., the distinction between the purpose of water retention and the prioritisation of drainage in the projects implemented). The achievement of the objectives is also hampered by the unclarified funding sources and coordination between operational programmes. There is often a lack of coherence between the different sectoral strategies related to NbS.

There has been no fundamental conceptual shift in urban development towards reducing urban sprawl, increasing urban rainwater retention, developing sustainable land use and protecting biodiversity rather than classical urban and infrastructural developments. Despite the fact that stormwater retention is already included in many local strategies (more likely in green infrastructure strategies or integrated water management plans) in a growing number, investments tend to provide isolated, small-scale and partial solutions. But if we count that ‘many a little makes a mickle’ **there is a growing number of local good practices.**

Territorial and local coordination occurs at county and municipal level and can be fulfilled by the sector-independent county and local municipalities or their horizontal cooperation (municipal associations). However, a lack of resources often hampers coordination at both municipal levels. Social awareness and responsibility for climate change, and hence support for NbS is growing, highlighting the potential and importance of civil society's involvement.

[11] 256/2021. (V. 18.) Korm. rendelet a 2021–2027 programozási időszakban az egyes európai uniós alapokból származó támogatások felhasználásának rendjéről

Municipalities have local legal instruments to keep ecological balance. In their local building codes, they can set stronger building regulations to preserve urban trees, biologically active surfaces and to develop ecological quality of urban green spaces. Budapest municipality, some of its districts, smaller towns of Budapest suburbia and big cities have their own local code on tree protection which regulates the action of tree cut and replacement, not only on public property but also in private land. They often also reinforce obligatory tree, shrub and forest planting in different building zones, for public and private investors. They can save the permeability of surfaces by requiring permeable pavements in a percentage.

Growing horizontal cooperation, funding opportunities and supporting tools increased interest in municipal NbS implementation. **Implemented solutions are mainly small-scale interventions: parks, street trees, and GI connected to the road infrastructure**[12].

The crucial points of a successful NbS implementation in Hungary: First, the intensive communication of the benefits of the NbS from the beginning of the project design is essential to inform stakeholders and raise their awareness. Involving locals in all project phases (from planning to maintenance) helps to build a sense of responsibility in the community. Ideas from committed local stakeholders, supported by the municipality, can be the most sustainable NbS examples.

From the residents' perspective, the most important aspects towards an urban green space are cleanliness, tidiness and well-kept public spaces. The size and condition of parks and green spaces, as well as air quality, were also important. Young people prefer sports facilities, while seniors prefer public safety and passive recreation (bench) facilities. For those raising children, the presence of a playground, while important, is not sufficient on its own. They are only really satisfied if there is a complex presence of several functions in the area. “Public spaces can be attractive if they are safe, designed and operated in a way that is appropriate to the function, meet community and individual recreational needs, help ecological conditioning, contribute to more accessible adaptation to climate change pressures, fit harmoniously into the settlement landscape and increase the local community's attachment to their own settlement”- according to a public survey in 2022[13].

The largest funding programme for green urban investments in Hungary was the Green City/Liveable City programmes financed from EU funds in the 2014-2020 (TOP 2.1.2) and 2021-2027 (TOP Plus 1.2.1) EU budgetary periods. This was a practical reorientation of the former renewal programmes in Hungary that concentrated on the complex rehabilitation of urban centres to make them more attractive and lively. The shift emphasized the role of greenery in urban centres, but unfortunately without a paradigm change towards innovative nature-based solutions. Due to the general mindset of the decision makers and the expectations of the citizens, Hungarian green city projects, implemented in the last financial period through the operational programs, were focusing on ‘tidy, well maintained and safe’ urban green spaces with multiple functions, reached by a renewal of a former green space. While project preparation was neither funded nor required for the funds, the majority of the

[12] Research and Policy paper on NbS by OECD and Ministry of Innovation and Technology, 2022
[13] Improving the local quality of life, evaluation of results of the operational program, Phase 2. Final Report, 21.11.2023.

projects lack real understanding of the natural assets and the baseline ecological processes. Developments focused more on developing paved community gathering and resting places, paved running paths, paved parkings near the entrance zones, new public lights and zebra crossings, new paved playgrounds, paved sports grounds, upgrading the existing vegetation by planting perennials and falling of dangerous old trees. As most of the developments resulted in loss of effective green areas, gross of paved and sealed surfaces, loss of canopy coverage, we could hardly say these were following NbS principles. Only a minority of projects considered the retention and use of organic matter or rainwater. However engagement and awareness-raising programmes were popular as the social leg of sustainability; only a few projects count on the public as a potential workforce for green space maintenance. Involvement is typically campaign-like (e.g. litter picking, collective planting), which does not serve to build real and long-term commitment and a stewardship mindset.

Development of NbS was not a primary and singular goal in these projects. Smaller towns facing flash floods e.g. Ajka or others directly profiting from a healthy and nice greenery like touristic towns such as Gyula were more urged to develop their projects based on NbS.

The paradigm shift for incorporating nature-based solutions into the development of urban green infrastructure in order to mitigate and adapt to the climate change in cities has continued on with a specific priority incorporated into the 2021-2027 budgetary period at the Operational Programme on Climate and Energy (KEHOP 2.2.1). Even if the call was long awaited, it was not issued due to the suspension of EU funds for Hungary.

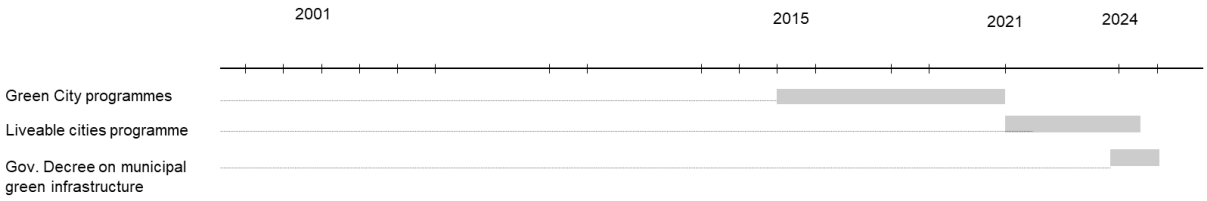

Figure HU10. Timeline of the main tools in nature-based interventions

5.3 Size and role of the market

NbS developments on a larger scale are basically carried out by the public sector. Emblematic public investments (Városliget renewal, Debrecen Nagyerdő renewal, Székesfehérvár - Lungs of the city project etc.) have a reinforcing effect for the development of the surrounding private areas, which also reaps the benefits to the private sector, due to the lack of real estate value tax.

Private investors are highly dependent on the clients expectations therefore the clients' demand has the most crucial impact on NbS instruments. The limited demand makes the market little attractive and limits competition among constructors. Due to the few good construction experts, even well-documented, carefully planned NbS projects tend to be far below the expected level.

NbS construction applies techniques (e.g. bioengineering solutions or habitat restoration) that require specific knowledge and material. These old-new materials and techniques should not

be necessarily expensive, but their re-introduction in the market needs higher effort and innovation from constructors. Until the demand for such materials and techniques increases, the limited supply will result in higher costs for NbS projects.

Current building acts still support a non-NbS way of thinking. The investor's interest to gain the maximum profit could result in densification, using only small case NbS. As there are no specific obligations nationwide to incorporate innovative NbS solutions into new construction (like green roofs or facades) there are rather unique cases where these solutions can be experienced.

On the other hand the local building regulations can create obligations for innovative and traditional green infrastructure developments in case of new construction (except the new housing investment is labeled as "priority investments" as will be described in the densification chapter). However, the position of the local government in requiring substantial green spaces or innovative solutions are highly dependent on the market conditions: in case the demand for housing is pressing, and consequently the local municipality is in a favourable negotiating position (like in XI. district of Budapest), then the developers are forced to provide high quality green spaces. While in other locations (like in Veszprém) where the solvent demand is limited, the constructors have a more favourable position to decrease the green obligations.

The weak execution of the regulations results in very few investors claiming to protect existing green infrastructure and contribute to the city's green infrastructure development. In Budapest, the expansion of paving and constantly shrinking tree canopy ratio in the private gardens of semi-detached housing areas resulted in a significant decrease of biological active surfaces.

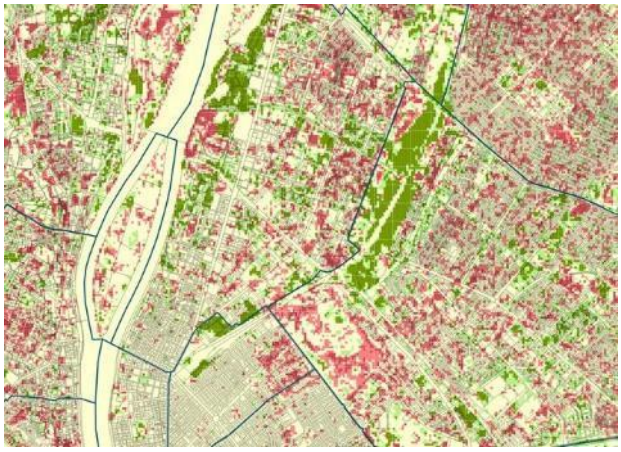

Figure HU11. Green intensity change of Budapest between 1990-2020. Note: Green: increased GI, red: decreased GI.

Source: (Tatai Zsombor et al., 2017)

5.4 The multilevel governance process

As was emphasized before, the national level provides regulation and guidelines. Regarding the urban green infrastructure, guidelines coupled with European funding are the most efficient

tools. National level legislation remained weak, but there is a hope that the most recent government decree on municipal green infrastructure will be an efficient tool to compensate for the loss of green areas due to construction activities.

The local municipalities are the most effective actors with regard to green investments by setting the local building regulations and implementing green investments on public spaces.

Governance layer	Role in Nature-based solutions
National Parliament	Nature Protection Law; National Adaptation Strategy; Nature Restoration Law; National Green Infrastructure Plans; National Building Act
National government	Decree on Green Infrastructure; Governmental Decree on Tree Protection; Government Decree on Town Planning; Government Decree on Municipal Green Infrastructure; Guidelines for urban NBS solutions; EU/national subsidy schemes for green urban developments
Regional level	—
County level	County level development plans
Microregions (deconcentrated governmental authorities - járás)	Construction authorities
Local municipalities	Local climate strategies and SECAPs; local building regulations; local green investments

Table HU4. Specific role of different governance layers with regard to Nature-based solutions

While there is no clear definition of NbS in Hungary, their uptake has grown over the past 10 years, with more than a hundred projects currently underway. Local governments in Hungary increasingly recognise NbS as a valuable tool to address multiple policy goals, particularly in relation to urban development and water management. For example, in Budapest, NbS are being mainstreamed in urban planning documents such as the Budapest 2030 Long-Term Urban Development Concept, the Smart Budapest City Vision and the Green Infrastructure Action Plan (so called Radó Dezső Plan).

District 13 in Budapest

District 13 of Budapest has made significant progress on implementing NbS on a local level and serves as an example for other municipalities. A series of 4-year long local green strategies (Angyalzöld 2008-2014, Angyalzöld+ 2014-2019, Angyalzöld 3.0 2020-2024) were developed, proved and implemented in harmony with the integrated urban development strategy. Nice, livable and safe public green spaces and a good network of public institutions formed the basis of the SUD for a district previously industrial, facing economic and population loss. The goal was to attract new residents and businesses. The district had its own brownfield development projects for offices and housing.

Greening of public places, rationalizing parking, developing canopy coverage, turning public green space attractive, creating walkable lines were among the goals of the strategy. The strategies focused on developing public green hubs (big public park or green square) in each residential area and connecting them by green promenades. Each development stage was participatory, important stakeholders were invited to contribute. Implementation was regularly monitored, results affected the development of the next implementation or the next strategy making process.

The local legal instruments of greening (tree protection, tree, green space protection) are more strict and more precise than the national framework. Execution was financed by the district's own budget. The implementation started a slight gentrification in each housing area. Paralelly, renewal of housing estate areas and social housing projects were carried out to keep better social balance of the housing areas, but in a smaller scale

Budapest Municipality and Budapest's districts are independent and equal local authorities. Each has its own wealth and properties. There are certain topics they rely on (mobility, urban planning), but the capital and its districts have separate strategies for affordable housing and NbS.

Budapest municipality
Budapest Municipality itself serves as a good practice. As green issues are for the major part of Budapest local policies, local institutional and legal framework was set up, background researches and strategies were formed and approved. Community involvement and the dissemination of achievement are on a high level, action plans are implemented step by step to improve the quality and quantity of urban green spaces, supported by NbS. Budapest has recently won URBACT Good Practice Label from the EU, for that cooperation model. Not only Budapest, but also its districts and other Hungarian big cities made significant steps to move forward.

According to a national survey, 70% of local governments used the concept of green-blue infrastructure or NbS in their work[14]. **But there is no significant connection between housing policies and NbS, neither on national nor on local level.**

5.5 Achievement, assessment and challenges

Due to the lower level of urbanisation and economic development in Hungary, there is a higher proportion of preserved natural habitats and a higher rate of ecosystem services they perform, compared to more developed countries. Therefore the potential for NbS implementation is higher than average. National NbS research, strategy development and implementation goes more less parallel with EU processes. In case of urban green infrastructure, EU directives and policy papers were slightly first, and have been followed by national actions. Meanwhile in the field of nature restoration, national policies and plans have preceded the EU Nature Restoration Law. Therefore, we can say, **in terms of NbS, Hungary is not just following EU policies but has been proactive.** There are many good practices, mainly on local level, support to form national policies and implementation as well.

In national policy, since 2010, environment and nature protection have been given less and less importance - the national institutional structure has been broken down, fragmented and restructured on a lesser scale, there is no real cross-sectoral and social consultation in the process. In parallel, there have been results on national level in line with EU policy, e.g. national ecosystem service mapping (2020), national green infrastructure plan (2021) and the policy paper on NbS (2022). Some achievements are very new, e.g. Green Infrastructure Decree, thus their implementation cannot be envisioned and evaluated yet. Due to the lack of a visible and reliable national policy and institutional framework, good practices are more likely to form on a local level where the challenges are.

There is also a geographical pattern in the spread and application of NbS principles. In the western and north-western parts of Hungary, where the climate change pressures are lower, NbS is less of a priority for development. In the regions more affected by climate change, the southern and south-eastern parts of the country, the implementation of NbS is much higher, especially in the large cities like Szeged or Kecskemét.

The largest incentive behind urban green investments are the European funds since 2015 coupled with guidelines and the obligations to create local climate plans. Approximately 370 million EUR[15] were spent on urban renewals containing significant interventions on green and blue infrastructure between 2015-2022.

A typical green infrastructure project of a **small town** from these EU resources is a renewal of a public green space to extend its function, to enhance accessibility and safety. This often results in a reduction of biologically active surface, the creation of new pavements, the cutting of trees or the development of intensively managed green space, which is contrary to the principles and tools of the NbS.

[14] Research and Policy paper on NbS by OECD and Ministry of Innovation and Technology, 2022
[15] The funds used in TOP 6.3.2-15 and 16, and TOP 2.1.2 calls.

Big cities have a much greater capacity to identify urban and climate challenges, prepare, implement and monitor projects properly. They are also more efficient in attracting higher levels of EU funding, as they can more easily generate the costs of project preparation and implementation. For this reason, a much higher number of innovative NbS solutions, implemented and maintained to a high standard, are found in large cities, especially in the more vulnerable ones in the Metropolitan Districts (Budapest Municipality and Districts 5 to 9 of Budapest) or the Great Plain region (e.g. Kecskemét, Debrecen, Szeged, Békéscsaba).

On the other hand, the EU funds can provide financial support for the creation and upgrade of green spaces, but it does not provide funds for the maintenance of them. Municipalities' income sources significantly decreased in recent years; thus, they have a very limited budget for NbS investments. The Stability Law restricts the municipalities' borrowing capacity, posing a significant barrier to Hungary's climate adaptation and protection goals. The normative fund system for green area management provided by the state to local municipalities does not consider the green area ratio of a settlement and the required maintenance intensity, which often leads to unrealistically low funds.

Publicly accessible green areas are primarily developed by the public sector. The role of the private sector in shaping the green environment is limited (except for the private family houses). It is acknowledged by the market that greenery increases the selling prices of a newly constructed residential complex, but as new construction is already hardly affordable one of the factors to make it still profitable is to decrease the green investments as much as possible.

The housing inequality effects of nature-based interventions are practically not studied or considered in Hungary. There are very few publications aiming to measure the access of different social groups to green areas and the impact of green investment on housing prices. Green gentrification, as a policy issue, is not part of the public or scientific discourse either.

It is widely acknowledged by urban planners, developers and researchers, that complex interventions into urban areas result in the increase in real estate prices but the question is how much green development alone contributes to these complex interventions. The type of green spaces also matters: as a recent study proves (Csomós, 2024), income level is not a decisive factor in Budapest with regard to the provision of urban green spaces (e.g. parks and gardens), while accessibility to urban forests and urban green in private gardens are strongly linked to the income level of residents. It is not verified yet, but our interviews in Veszprém and Ajka also show that due to the fact that housing estates, currently accommodating the middle class, are built with a high rate of greenery, income loses its importance as a major factor for accessing public greenery. However, large scale green investments might have an impact on real estate prices and, after a while, might lead to a change in residential composition (this is a hypothesis already evaluated in case of Széll Kapu project in Budapest - Csite, 2016 - and is foreseen in Veszprém with regard to the interventions at the Séd stream).

Housing inequality result (hypothesis)	**Mechanism resulting in housing inequalities**

Bottlenecks in accessing nature-based solutions and suffering from the climate effects	Income seems not to be a decisive factor in accessing urban greenery due to the path-dependent urban structures in Hungary, while private green and urban forests are more accessible by high income people.
In case of large scale urban green projects the increase of property prices in the neighbourhood might lead to green gentrification.	Large scale green projects are evaluated by the market as relevant as complex urban renewals thus tend to increase the real estate prices.

Table HU5. Potential housing inequality impacts of nature based solutions

As the phenomenon of green gentrification is not yet included into the public discourse, there are no specific public policies developed to counteract the effect. However, one of our interviews in District 8 of Budapest revealed that public actors decided to implement step by step green space development projects instead of large-scale ones in order to avoid the rapid increase in real estate prices.

6 Densification projects

6.1 The policy cycle: emergence of the issue and policy decisions

In Hungary, there is no explicit densification policy at neither national nor on municipal level. Increasing population density is not even part of the professional discourse, as the population density of our inner cities has decreased significantly due to the suburbanisation processes that started after the privatisation of housing in the 1990s. The inner districts of Budapest lost even 30-40% of their population between 1990 and 2000. While in 1990, there were 269 people per 100 dwellings in Hungary, this figure fell to 217 in 2025, after a steady decline. In Budapest, the same phenomenon reduced the number of inhabitants per 100 dwellings from 254 to 173.[16]

The densification of the urban fabric is reflected in professional awareness, concepts and education, but it barely reaches the level of political discourse, much less the level of direct governmental or municipal policies, regulations and legislation. In Hungary, purposeful densification of the urban tissue is practically not part of the green toolbox.

Thus the European Union's strategies and directives have only an indirect impact on the densification of Hungarian settlements, mainly through the protection of the amount of natural areas. The key document on this issue is the European Commission's Roadmap to a Resource Efficient Europe, published in 2011, which already sets the target of 'No Net Land Take' by 2050. However, only some of the member states have set quantified targets for reducing land take by 2021. Therefore, the Commission's "Soil Strategy to 2030", published in 2021,

[16] https://www.ksh.hu/stadat_files/lak/hu/lak0002.html

reiterates this target, calling on member states to set their own ambitious targets in this area by 2023, at national, regional and also local scales. It also outlines the “land take hierarchy”, encouraging the member states to use it, in particular to prioritise urban rehabilitation in their developments.

As seen in Figure 12, even if the related policies and strategies in force in Hungary today generally preceded the European Soil Strategy, Hungary has not made any quantified commitments to reduce artificial land use. However, the issue of urban sprawl has already been addressed in Hungarian policies.

The National Framework Strategy for Sustainable Development (2013) and the National Environmental Programmes prepared on the basis of it in six-year cycles since 1997 provide the basis for the policy of environmental protection.The main structure of the programme, which is in effect until 2026, does not classify the land as a natural resource, but considers spatial and urban planning policy as a strategic instrument for environmental protection. Somewhat contradictory to the above, the strategic instrument of spatial policy stresses that *“Land should be considered as a valuable natural resource. In this context, the protection of natural resources in a fragile state may require the introduction of normative, restrictive measures, possibly even a total ban on their exploitation. It is essential to promote land use that is environmentally friendly, saves land and promotes energy and resource efficiency and climate protection."* The analysis of urban policy as a strategic instrument also highlights the damaging process of loss of open land, which it seeks to counter by limiting the amount of land available for new development and by reusing brownfield land. Also related policies, such as the National Landscape Strategy (2017) and the Soil Protection Action Plan (2020) aim at the reduction of urban sprawl and the development of compact settlements.

However, as the most important tools, concepts for spatial development and spatial planning should guide the territorial context, underpinning and coordinating sectoral policies. Hungary adopted a National Territorial Development Concept in 2005 and a National Development and Territorial Development Concept in 2014. Spatial development and planning inherited the principle of territorial convergence - catching up - as an objective from the decades of socialism, which was reinforced by the country's growing territorial disparities after the regime change. Over the years, this objective has been complemented by the objectives of an economic competitive spatial structure for development (1990s), integration into the EU spatial structure (2000s) and, first in general, then more specifically, sustainable land management. The concept, adopted in 2014, for the first time explicitly sets out the objective of creating a compact urban structure and among the instruments leading to this, it highlights the attractiveness and densification of inner city areas and the re-use of brownfield sites. Although these programmes, plans and strategies should underpin Hungary's territorial and municipal plans and also the sectoral decisions, unfortunately they do not contain any requirements that can be quantified and enforced by law on public, municipal or private actors. Thus, although the tool of densification is part of the professional discourse now, it is hardly part of Hungarian green politics.

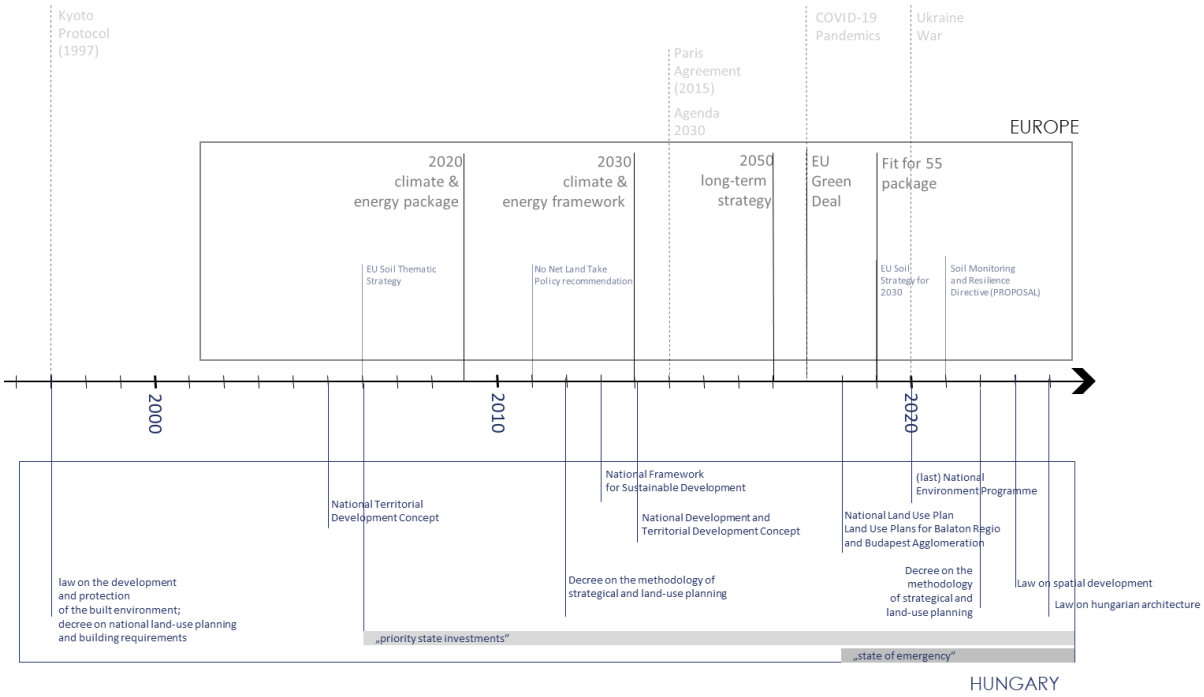

Figure HU12. The changing conceptual, planning and legal environment for urban densification in Hungary

6.2 The implementation process

6.2.1 Spatial planning

The planning tradition in Hungary is linked to the German school of spatial planning and modernist principles of urbanism, and thus relies on the regulation of functional land use at the national, regional, county and municipal level. The methodological basis for spatial development and planning is laid down in a law passed in 1996. The law sets out the hierarchy of Hungary's territorial plans, their mandatory content, the method for their preparation and approval[17]. (In 2023, the Parliament adopted a new law on spatial planning[18], but the plans in force were still based on the old law.)

At the top of the hierarchy is the National Land Use Plan[19], the current version of which - relying on the National Development and Territorial Development Concept (2014)[20]- was passed by the Parliament in 2018. This plan sets out the zones that are protected for different reasons - ecological networks, high quality and excellent cropland, landscape protection and world heritage zones, water quality and flood zones, military zones. By integrating all these, it defines the land use of Hungary, dividing it into forestry areas, agricultural areas, water management areas and settlement areas.

[17] 1996. évi XXI. törvény a területfejlesztésről és a területrendezésről
[18] 2023. évi CII. törvény a területfejlesztésről
[19] 2018. évi CXXXIX. törvény Magyarország és egyes kiemelt térségeinek területrendezési tervéről
[20] 1/2014. (I. 3.) OGY határozat a Nemzeti Fejlesztés 2030 – Országos Fejlesztési és Területfejlesztési Koncepcióról

In the same law, the land use plans of two priority regions, the Budapest Agglomeration and the Balaton Special Tourist Area, were passed[21]**.** The special status of those regions is partly justified by landscape and environmental sensitivity and partly by the pressure from the stakeholders of the real estate market.

Consistency between the national and priority regions' land use plans is ensured by parallel preparation - in the same urban planning studio - and joint approval. All further county zoning plans, municipal zoning plans, building codes must be adjusted to these highest level plans, according to the following hierarchy:

Responsible level of government	**Development concepts**	**Land use plans, zoning plans and building codes** (legally binding)
National level 1: Parliament	National Development Plan 2030 - National Development and Spatial Development Concept (2014)	Territorial (land-use) Plan for Hungary and Some of its Priority Areas (2018)
Sub-national level 2: county	counties spatial development concepts	counties land use plans
Sub-national level 4: municipality	municipal development concepts	municipal zoning plans and building regulations

Figure HU13. Hierarchy of territorial and municipal development concepts and land use / zoning plans, building regulations in Hungary

National and county-level territorial plans aim to protect natural and agricultural areas primarily by limiting the expansion and growth of urbanised areas. Due to the strict hierarchy between national, county and municipal level as seen in Figure 13, municipalities can mostly designate their for-build zones within the area designated as a settlement area in the national and county-level land use plans.

In responding to real urbanisation trends, the land-use plans of the priority areas - the Budapest Agglomeration and the Balaton Special Tourist Area - primarily sought to restrain the zoning of new, low-build areas through prohibitions, procedural complications and infrastructure requirements. In all cases, however, the role of the national level in granting exceptions was enshrined in the procedural code. It is therefore not surprising that the plans have also produced little results.

6.2.2 National-level regulation of urban planning

Urban development and planning in Hungary is basically the mandatory task of the municipalities, which have to draw up their own development concepts, land-use plans and building regulations within the framework of national legislation and within the hierarchy of national, regional and county-level land-use plans. The national legal framework for the planning process is the Law on Architecture and Urban Planning and its implementing

[21] 2018. évi CXXXIX. törvény Magyarország és egyes kiemelt térségeinek területrendezési tervéről

government decrees in force at the given time.[22] However, the increasingly chaotic legal environment since 2012 makes coherent planning more and more difficult for municipalities.

The trend towards compact settlement form is becoming more and more visible in the changes to the urban planning framework. The fresh architecture law, in force from 2024[23], has also included in its principles some principles related to densification, such as the "necessary minimum principle" (§5), the "principle of preservation of natural systems" (§7-8), the "principle of priority of brownfield sites" (§9). Defensive instruments in the government decree detailing the implementation[24] include the formal and procedural obstacles to the designation of new built-up areas, the formal and procedural obstacles to the merging of settlements, and the introduction of biological activity requirements.

The methodological basis of urban planning in Hungary is, like in spatial planning, the regulation of land use and, on a smaller scale, the restriction of construction parameters. The most important defensive instrument in terms of densification is the limitation of built density, heights and the maximal number of dwellings per plot.

The implementing decree of the law on urban planning specifies the types of land use that can be designated. In the case of residential areas, urban, peri-urban, suburban and rural residential areas may be designated. For each type of residential area, the national decree sets maximum values for density, height, etc., which may be further tightened by the municipality in its building regulations. With regard to the national policies, it can be noted that the modifications in the implementing decrees have been slightly more lenient over the years, mainly in the building parameters for rural, suburban and peri-urban residential areas. For example, the maximum building heights in rural and suburban areas have been changed to allow the addition of roof spaces to single-storey buildings. The regulation of peri-urban residential areas has allowed for increasingly higher building density, which is often reflected in the urban design of new housing estates in the Budapest agglomeration. However, the regulation of minimum densities is completely missing from the legal framework, which leads to the survival of the low density family housing zones in the outskirts of cities.

[22] The main legislative documents implemented in urban planning and zoning:
- 1997. évi LXXVIII. törvény az épített környezet alakításáról és védelméről
- 253/1997. (XII. 20.) Korm. rendelet az országos településrendezési és építési követelményekről (OTÉK)
- 314/2012. (XI. 8.) Korm. rendelet a településfejlesztési koncepcióról, az integrált településfejlesztési stratégiáról és a településrendezési eszközökről, valamint egyes településrendezési sajátos jogintézményekről
- 419/2021. (VII. 15.) Korm. rendelet a településtervek tartalmáról, elkészítésének és elfogadásának rendjéről, valamint egyes településrendezési sajátos jogintézményekről

The new legal bases that will enter into force in 2024-25:
- 2023. évi C. törvény a magyar építészetről
- 2023. évi LXIX. törvény az állami építési beruházások rendjéről
- 280/2024. (IX. 30.) Korm. rendelet a településrendezési és építési követelmények alapszabályzatáról (TÉKA)

[23] 2023. évi C. törvény a magyar építészetről

[24] 280/2024. (IX. 30.) Korm. rendelet a településrendezési és építési követelmények alapszabályzatáról (TÉKA)

Densification attempts in Budapest's regulatory plan under preparation

Budapest's two levels of local government, planning powers are shared between levels. While Budapest, in consultation with the districts, adopts the urban land-use plan and a regulatory framework; the districts adopt the precise zoning plans and building regulations within this framework.

The urban planners of BFVT have long been committed to structural densification of the urban fabric, and are therefore reluctant to designate, for example, a rural residential area in the city, despite pressure from districts and developers. The new building law now gives the capital the opportunity to designate so-called "development action areas" in the land use plan and to set more detailed building parameters for these areas, which are also binding for the districts. In the plan under consultation, the planners have therefore set not only maximum but also minimum densities for these action areas.

6.2.3. Ruling by government decrees

Despite the hierarchy of planning and the nicely described planning principles, the greatest weakness of Hungarian spatial and urban planning is that it provides countless opportunities for the government to make exceptions to spatial plans. The tool of exception is to declare the development as a 'national priority investment' by a government decree, which excludes it from the scope of regional and municipal plans.

Originally, in 2006, a law[25] created the background to "national priority investments" for investments made with EU or state aid in order to speed up the absorption of EU cohesion funds. Later, however, the scope of the law was extended to newer and newer, smaller and smaller-scale public projects, and finally to private developments too, so that even small-scale private housing developments became the subject of a decree of priority. In principle, the new architecture act has tightened the scope of the prioritisation, but the government may still have a number of elusive reasons for prioritisation.

The number of priority investments suddenly jumped after the FIDESZ government took office in 2010. While between 2006 and 2010, 24 such government decisions were adopted, between 2007 and 2021, some 3,000 projects were declared priority projects in some 500 government decrees (Lukács 2021). The increase in the number of national priority investments adopted under this law after 2011 reflects the constitutional change introduced by the new Hungarian Fundamental Law (2011). With the introduction of the Hungarian Fundamental Law, the protection of local interests was eliminated from the list of constitutional values (Siket 2024).

The map of 'Átlátszó' in Figure 14. shows the investments prioritised between 2018 and 2021, especially the concentration of such projects in the opposition-led Budapest and its agglomeration. This concentration is partly due to the buoyant real estate development in the Budapest agglomeration, because priority investments now also reach small-scale private developments - housing developments, small-scale offices, castles, gravel mines, anything

[25] 2006. évi LIII. törvény a nemzetgazdasági szempontból kiemelt jelentőségű beruházások megvalósításának gyorsításáról és egyszerűsítéséről

that could be exempted from stricter building, heritage or environmental regulations or community control.

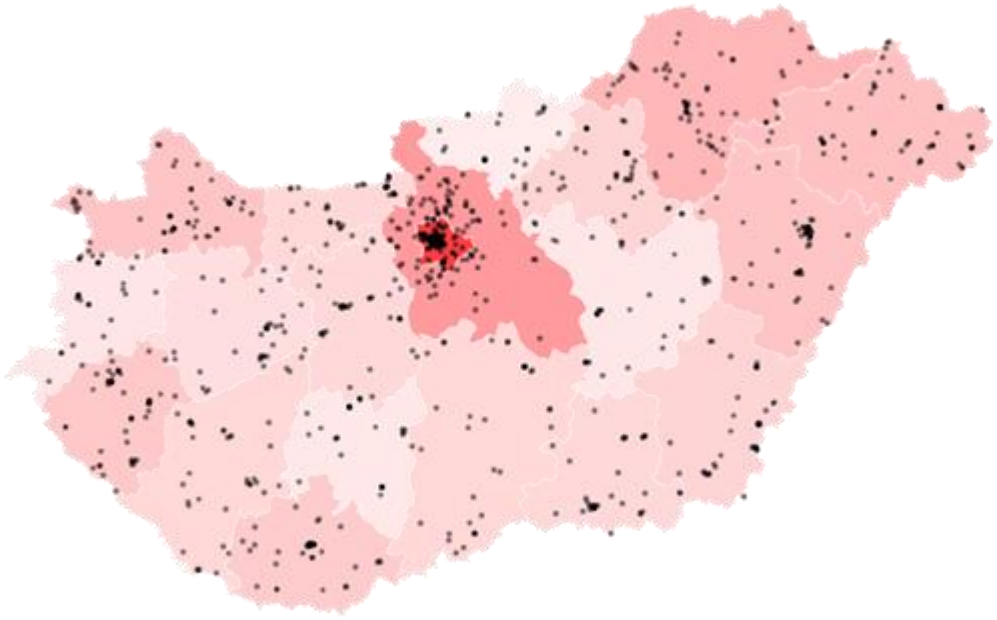

Figure HU14. Developments declared to 'state priority investment' between 2018 and 2021(Source: Átlátszó)

NGOs have spoken out against the practice, and the Ombudsman for Future Generations - now just a second deputy to the Ombudsman for Fundamental Rights - published annual reports criticising the practice in 2011, 2012, 2013 and 2015 - all in vain Municipalities also have no protection against government's prioritisation decrees: although municipalities lodged constitutional complaints against prioritisation decisions in 14 cases between 2015 and 2023, the Constitutional Court rejected the complaints in all cases. (Siket 2024)

The political aim of the concentration of priority investments in Budapest is certainly to narrow the policy space of the Budapest municipality and the districts, which have been led by the opposition since 2019. The map of "priority investments" in Budapest (Figure 15) illustrates that the city most regularly loses its planning sovereignty over its most sensitive waterfront development areas, its rust belt development areas and historic neighbourhoods.

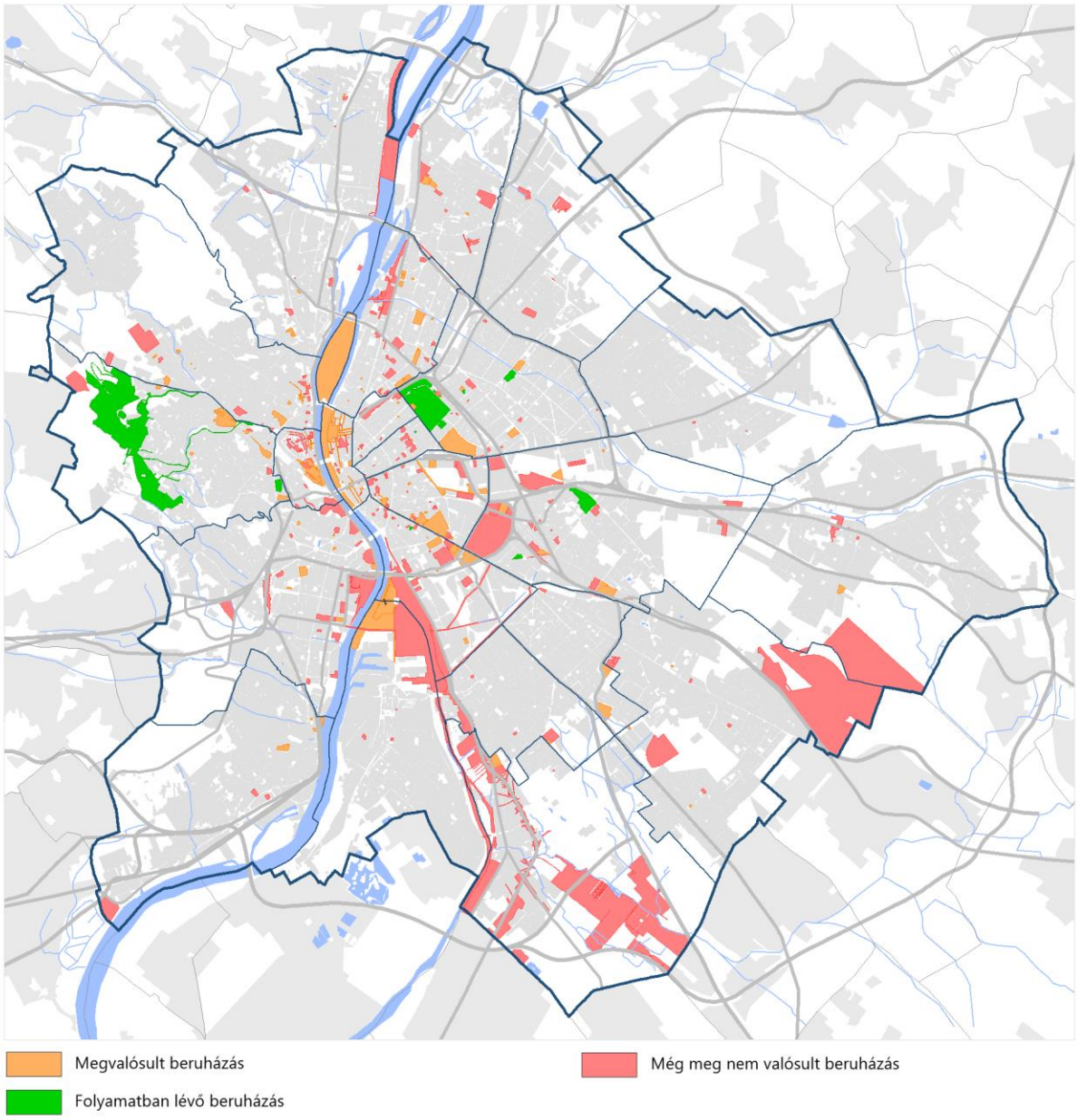

Figure HU15. Developments declared to "state priority investment" in Budapest, until 01.11.2024.

(orange: completed; green: ongoing; red: planned investments)

Source: From City to Home - Urban development Plan of Budapest (under planning), preparatory report, Volume III. p.758.

The building regulation for these investments is subject to individual government decisions, irrespective of the building regulations of the given municipality. Part of the regulation of priority investments is the almost complete elimination of transparency and opportunities for community participation in the planning and permitting processes, making it almost impossible to research the content of projects. It is difficult to make general statements about the nature and amount of the planning simplifications, because they are always tailored to the needs of the individual investor. Nevertheless, the experience has shown that in case of "priority state

investments” there are no more obstacles, whether for environmental, social or urban planning reasons. Their density, building height can be significantly higher than the surrounding area, the capacity of local infrastructure, etc. These exceptions as “national priority investments” decide the fate of a site in such a way that professional urban planning or public consultation are no longer needed, and a purely economic-political decision is made. These developments thus become breeding grounds for corruption. Parallel to this, the possibility of control is weakened or disappears. The rule by decrees takes many areas out of the regulation power of municipalities, thus not only depriving them of tax revenues, but also making coherent urban planning and development impossible.

However, the government sees the system of priority investments as a suitable and systematic tool. This is reflected in the fact that the law establishing this system was integrated into the new architecture law[26] at the end of 2023.

Beyond the practice of “state priority investments”, the Hungarian parliament declared a state of emergency from March 2020, citing the coronavirus epidemic, and from May 2022 citing the war in Ukraine, which gives the government a permanent opportunity to govern by decrees. This allows the overriding of virtually any law. This was the tool used by the government when it overwrote the provisions of the law on urban planning by government decree in December 2022. The content of the decree has nothing to do with the war in Ukraine. This incident perfectly illustrates how direct governmental control upsets the planning order and deprives municipalities of their urban planning rights.

6.3 Size and role of the market

As a result of the territorial disparities of the Hungarian economy and the internal migration processes mentioned in the introduction to this chapter, significant demand for housing, housing construction activity, only occurs in the target areas of migration. As shown in Figure 16., these are the capital and its agglomeration, the second scale cities (Debrecen, Szeged, Pécs, Győr) and their agglomerations, the cities affected by national/international industrial development projects and their agglomerations (e.g. Kecskemét), the immediate vicinity of Lake Balaton and the settlements of the Austrian catchment area of the western border. Building regulation, including the instruments for densification, is only relevant in these municipalities.

[26] 2023. évi C. törvény a magyar építészetről

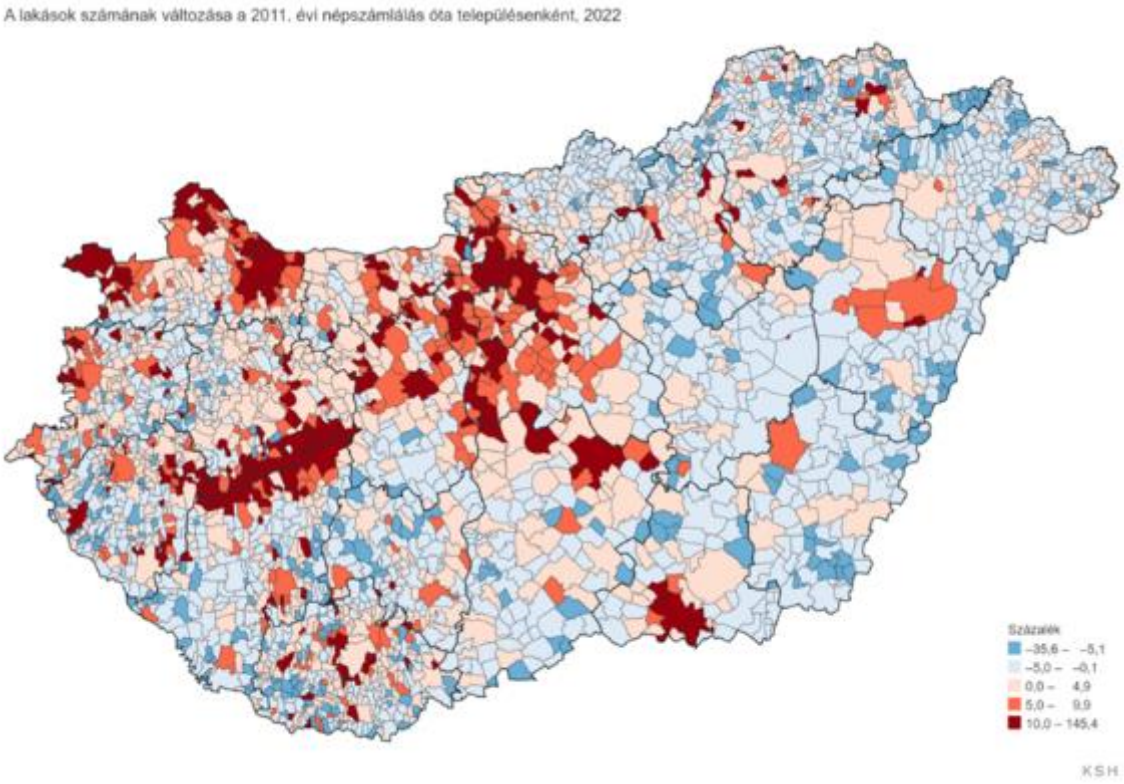

Figure HU16. Change in the number of dwellings between 2011 and 2022

As the volume of public and municipal housing construction is negligible, only private housing developments define the market. Projects with densification effects are developed where there is a market demand for housing and where building regulations allow significantly higher density development than the existing urban fabric.

We can identify five typical types of real estate development interventions that contribute to the densification of the urban fabric

- The development of inner-city gaps, often at a higher density than buildings in the surrounding. (type 1)
- The construction of multi-apartment buildings in traditionally single-family houses or villa areas (type 2)
- Complete redevelopment of old residential areas at significantly higher densities (type 3)
- Conversion and dense urban development of brownfield areas (type 4)
- High-density, low-quality new developments on brownfield or greenfield areas, without any urban context (type 5.)

The five different types of projects leading to urban densification have different impacts on both densification and equal access to urban housing:

The development of vacant or low-use gaps (type 1) in already dense inner-city areas contributes little to the increase of residential density. The districts of Budapest's inner

city have an a priori high density of built-up areas (floor area ratio of 4-5). Until the change of regime, the density of the population was also high in those districts but the suburbanisation following the privatisation of the housing stock reduced the population by 30-40 %. The inner parts of Erzsébetváros and Terézváros (districts VI. and VII.) were valorised in the 2000s by the starting development of the CBD. This motivated the district municipalities to a new building regulation with significantly higher density parameters enabling the real developers the realization of the new market value of the properties. The redevelopments provoked strong opposition from the residents and NGOs defending historic architectural values, and resulted in public lawsuits. In the more outlying, but still inner city residential areas, higher/denser building possibilities for new developments are really needed to kick-start the city's regeneration process by private investments. This has happened in the renewal of Ferencváros (district IX.) from the 1990s to the present, in the regeneration of the areas along the Lehel street (district XIII.) after the crisis of 2015, or happens today in the Magdolna neighbourhood (district VIII.). This latter process clearly shows that low-prestige residential areas may be filtering upwards on the housing market due to the private projects, but the neighbourhood's housing stock and society will retain its heterogeneous character for a long time yet.

To improve the dispersed urban structure, the urban densification of large detached house areas (type 2) would be the most important for Budapest. This type of densification was the aim of the reform of Zugló's (district XIV.) building regulations in the 1990s. New developments were significantly denser and higher than existing urban fabric, up to 6-8 storey multi apartment buildings among historic villas. This met naturally strong resistance from the local population. The regulations were withdrawn. Nevertheless, real estate market pressures continue to result in similar, perhaps a touch less aggressive real estate developments in the most prestigious areas of Budapest (districts II and XII). The developments are motivated primarily by the green environment and high residential prestige. However, the public transport and the institutional infrastructure in these areas is poor, so population growth creates transport, services and environmental problems. Dense, multi-family developments in these districts take advantage of the traditionally high prestige of the area, while targeting a lower, (upper) middle class clientele than the residents of the villas. The processes allow young couples and families to move in these districts, accelerating the change of generations already underway. These neighborhoods have long been and remain the most prestigious residential areas in Budapest, so the new developments play any role in providing access to affordable housing. Similar trends can be observed in the outlying, less prestigious areas of Budapest (e.g. district XVI.) and in the agglomeration, where 4-6 apartment buildings are often built illegally in single-family areas (building regulations allow here a maximum of 1-2 apartments per plot in most cases). The clash between the needs of the young generation of home buyers, the developers who want to serve them and conservative building regulations is causing long-term infrastructure and real property law problems and neighbourhood conflicts.

The only large-scale redevelopment of a downtown residential area (type 3.) was the Corvin Promenade project (district VIII. of Budapest), realised in collaboration between the district municipality and a big real estate investor. The original plans for the redevelopment also anticipated an increase in density. With the withdrawal of the state from the financing, additional costs were passed on to the private investor, which the district

municipality was able to compensate by further relaxing the building regulations - by adding two more additional floors. The area is perfectly served by public transport, which provides the basis for densification. However, a significant number of low-value dwellings have been lost in the project, which has only been partially replaced by new build social housing in the district. In many cases, area residents have received cash redemption, causing them to move out of the neighbourhood, and often out of the district. The urban rehabilitation has resulted in a fairly homogeneous housing stock, aimed at middle-class needs. Following the economic crisis of 2008 and the extreme centralisation policy of the government (since 2011) affecting planning and financing tasks of municipalities, there seems to be no chance for a similar large-scale urban regeneration process led by a city or district.

Similar problems are caused by new residential areas created by **large-scale development of brownfield sites (type 4)**. To slow down the suburbanisation process, it is welcome that since the 2000s real estate developments have discovered these sites, especially the best locations along the Danube. Unfortunately, only a part of the new residential neighborhood has been located on appropriate infrastructure (e.g. the Marina-part in the XIII. district, supplied by a metro line, the widened Váci street and a large shopping centre). In several projects, especially those declared as 'priority state investment', the municipality has not even been able to ensure minimum urban service conditions in term of public transport or children's facilities (e.g. Budapart, Waterfrontcity, etc.). **As these projects are the largest, often neighborhood-scaled housing developments in the city, they are the ones that most reshape the spatial structure of the housing market.** The price per square metre of the developments target a middle-class, upper-middle-class buyer stratum, creating socially quite homogeneous neighbourhoods.

The latest type of uncontrolled densification to emerge are **concentrated projects with very high density, very low architectural and urban design standards and high housing numbers (type 5.)**. These low-price investments are planned in the outer districts of Budapest, in brownfield-, but also often greenfield areas, without public transport and other facilities. Again: as 'priority investments'. It is to be feared that these investments will become the slums of the next decades in Budapest.

In summary, the leading force in any type of urban densification process in Hungary is the private actors of residential real estate development. **Municipalities do not play a role in site allocation due to their lack of real estate ownership.** Private property developers can enter into a planning contract with the municipality if their market interests require a higher density of development than that prescribed in the regulations. If this fails or is not sufficient, they can apply to the government for a status as 'priority investment' Large-scale private residential developments typically receive priority investment status from the government, which requires just filling in a form - and political connections. The grounds for the prioritisation decisions are not public. The system of priority investments thus makes it easy for private developers to lobby at government level, leaving the municipal level out of the whole process.

Although already the building codes of local authorities often contain alarming floor area ratios, the planning contracts between municipality and developer and especially the 'priority state investments' further increase the density and enable skyscrapers contrary to the municipality and the public opinion, destroying the cityscape.

6.4 The multilevel governance process

In line with the above, theoretically the municipal governments could be the main agents of the structured densification of the urban fabric, and they could control the market-driven real estate development through building regulations. Unfortunately they can only serve this role very poorly.

The desirable way of densifying the urban fabric would be to differentially increase the allowed building heights and building density following urban structure considerations, for example along high-capacity public transport lines. Unfortunately, we hardly see any examples of this: municipalities rarely use this instrument.

The historical reason for this is that after the regime change, municipalities competed for developers through supply-side building regulations. The zonings drawn up at that time offered in total many times more building opportunities than the real developers' demand. For example, a study of BFVT in 2008 (BFVT 2008) examining the development potential of South Budapest finds that the volume of development allowed by the current regulations is 2.6 times more than the projected market need over 15 years. The fear of compensation lawsuits still prevents municipalities from tightening up what the too laxly regulated building regulations fixed. We know of one district (district XI. in Budapest that has been negotiating in recent years to reduce the regulations that allow excessive densities.

As a result, new developments of inner city gaps (type 1) are typically built higher and denser as the environment. In the 1990s and 2000s, there were attempts to systematically densify the built-up area in inner districts (type 3) and one transition zone district (type 2), both of which met with professional, public and political resistance. Minor resistance was triggered by the Corvin Promenade project (also type 3), where the intensity of building also increased significantly. In this urban renewal, however, the entire stock of buildings, housing and population in the action area - of low value - was changed, and therefore the densification met less reaction. Local politicians and chief architects of the districts and smaller cities also fear NIMBY-type conflicts resulting from the densification of existing neighbourhoods, based on these experiences.

Hungarian urban planners consider the reuse of brownfield areas (type 4) as the most important offensive tool for urban densification. The reason is that the industrial restructuring of the 1990s, the withdrawal of Soviet troops and the change in transport technology left behind a large amount of under-utilised sites in our cities, the conversion of which has been limited to the present day. According to Budapest's brownfield land register (conducted since 2015), in 2023 more than 5% of the capital's area represents brownfield areas, which (could be) the basis for densification and a new housing policy of the city.

Despite this, from 2020, yearly merely 40-50 hectares of brownfield land will be converted in Budapest, representing just 1.5-1.7% of the available brownfields areas.

To accelerate this process, in 2019, the Parliament introduced the definition of ‘brownfield areas’ in the law on urban planning and also in the spatial plan of the Budapest agglomeration and the Balaton region, which is linked to municipal planning tasks and later to national housing policy financial benefits (temporary VAT reductions). However, the right to designate those

‘brownfield areas’ for these benefits was kept in government hands, which did not accelerate the recovery of brownfield sites, nor contributed to a significant volume of new housing construction or to the conceptual structural development of the city. The new architecture law foresees the establishment of a national cadastre of rust belt areas, which would automatically transfer the building regulation of these areas to the state level, further reducing the planning sovereignty of municipalities.

6.5 Achievement, assessment and challenges

Hungary has several strategies, concepts and programmes that consistently fight against urban sprawl, aiming at reaching the ideal of the compact city on a theoretical level. However, all these principles are not reflected in quantified commitments at national level, nor in sectoral plans or building codes at lower levels. The effectiveness of the concepts is also in question in the documents themselves. The background document of the National Development 2030 - National Concept for Development and Spatial Development (2014), states that the implementation of the previous plan (2005) is close to zero and sums up the main reason following: *“governmental will to enforce the objectives of territorial development policy was missing.”* Accordingly, the area taken out of cultivation is increasing steadily and we are not approaching the ‘No Net Land Take’ target, as illustrated on Figure 17.

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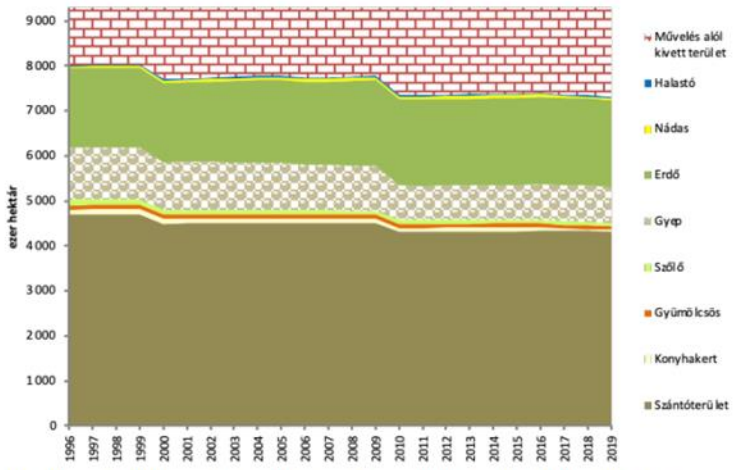


17. ábra: A földhasználat változása, kategóriák szerint 2019-ig [ezer ha]

(megj.: a KSH adatgyűjtés módszertani változása miatt 2020-tól már csak a mezőgazdasági terület (szántó, konyhakert, gyümölcsös, szőlő, gyep) adatai állnak rendelkezésre)

(forrás: KSH)

Figure HU17. Change in land use rates between 1996 and 2019, with artificial (built-in) areas in the upper bar

The timeline in Figure 12. illustrates the accelerated and chaotic change in the legal environment governing municipal planning since 2012, which has become increasingly difficult for municipal planning to follow. Today, the legal framework for urban development is characterised by a patchwork of plans and regulations, often contradictory, and exceptions

that are becoming systemic. In such an environment, it is impossible to implement professional strategies, whether from European or national level.

In sum, it can be concluded that development processes in Hungary, which result in urban densification, are not driven by public policies but by the will of private property developers.The organised lobbying of developers can also achieve systemic advantages at the state level (e.g. the lobbying of large developers has played a significant role in the reduction of VAT rates for the brownfield investments and housing in general). At the same time, a planning agreement with the local municipality or a declaration as 'priority investment' by the government is an easy way to relax the standard values of the local building regulations. Due to financial and governmental pressures, municipalities are also mostly unable and unwilling to orientate or restrict these projects in terms of zoning.

Without public and municipal housing development, projects resulting in higher urban density will not expand the affordable housing stock. The redevelopment of low-status residential areas is a minority of housing projects, and therefore does not have the classic gentrification effect. However, it should be noted that the private housing developments of increasing volume, mainly car-based, target typically upper-middle class customers and restructure also the spatial social composition of the city. At the other end of the spectrum, there's the danger of projects developed in highly isolated environments on low standards to become the future slums.

In Hungary, we have neither quantitative studies nor qualitative analyses on the social consequences of densification projects and their effects on housing. Based on our professional experience, the investments analysed in our previous case studies, and the actual expert interviews, we have summarized our hypothesis in Table 6. In the absence of data and research on the effects of densification, especially of large private housing developments on housing accessibility, policies to reduce these effects are also lacking.

Housing inequality result (hypothesis)	**Mechanism resulting in housing inequalities**
Deficiencies in accessing homes in densified areas	Densification means new construction that has to follow high energy standards. As new construction is practically exclusively privately developed, it has a high end price.
Segregated urban structures	Densified areas built for high and higher-middle class increasing the spatial disparities
	Concentrated low-cost investments create new poles of segregation
Worsening the affordability of housing in general	New homes on densified areas are objects of financialisation as most of the new units are not occupied by the owner but are rented out or stay empty. This "artificial" increase of housing demand makes new homes less affordable for the local citizens.

Table HU6. Estimated influence of densificating urban projects on housing inequalities

7 Summary and discussion of results

The first policy attempts in retrofitting, nature-based solutions and densification were established mostly before Hungary's accession to the EU (2004), however the EU regulations and financial sources has accelerated the implementation. Hungary is rich in papers and strategies, but rather poor in tools and implementation.

Energy efficient interventions in the residential sector

The rate of renovation is well below the desired 3-3.2% (hardly reaching 0.5-1% annually). This is due to the lack of financial incentives created by the caps on utility prices - to be described later in the chapter -, the low level of public subsidies that currently concentrate on the family house sector and low level of awareness on energy efficiency compared to the day-to-day problems of making a decent living.

Vulnerability and energy poverty is not considered properly in policy documents (National Energy and Climate Plan, Long-term Renovation Strategy). There is no clear, measurable and operationable definition of energy poverty and the main tool defined against it (besides the utility price caps) is the energy efficiency obligation scheme, which by nature, cannot handle complex social issues. Hungary is not eligible for the Recovery and Resilience Facility due to not meeting the conditionality criteria, and the Hungarian government recently decided to opt out from Emission Trading System (2), thus will not be eligible for Social Climate Fund either. The lack of EU funds further narrows down the possibilities of the public sphere to encourage the renovation process, despite the fact that Hungary is likely to be affected the most by the climate change in Europe.

Implementing nature-based solutions

The first regulations with regard to nature-based solutions were developed independently from the fact that Hungary is a member of the European Union. However these regulations were mostly affecting the rural environment and green developments in urban areas were less considered. Climate change and some paradigm shifts in urban greening still encouraged the creation of pilot projects with regard to water retention and mitigation of the urban heat island effect. From 2015 these efforts were supported by EU funded operational programmes through which green aspects became one of the driving forces of urban development. Nevertheless, most of these EU funded projects might be called 'green beautification' rather than real nature-based solutions.

Green interventions driven by market forces are rather limited (except for private interventions in family houses) as even if new constructions have a higher prestige in a green environment, these interventions are too expensive for the potential buyers. The majority of the new housing units are bought for commodification purposes, to rent out or let it empty, thus the owner does not challenge the green quality of the investments. The local municipalities can influence the green quality of new construction through local construction regulations and bi-lateral development contracts, but the efficiency of these tools heavily depends on solvent local demand for housing, which is in general rather low in most Hungarian cities and towns.

Densification of the urban texture

In Hungary, the policy of densification for ecological reasons has recently been introduced at the level of the principles of the new building law, which municipalities are still hesitant to apply. However, as a result of the activities of private developers, helped by the system of 'state priority investments', higher-density development than the surrounding area is appearing in the urban fabric - mostly ignoring urban structure requirements and green principles.

The primary 'densification' policy, supported by legislation and funding, is the development of brownfield areas. In the absence of state or local regulation, the increasing volume of residential development projects is creating new homogeneous housing stocks and following social structure, which is transforming the spatial and social fabric of our cities.

In the lack of data and studies, we can only make hypotheses about the effects of such new, dense neighbourhoods on housing accessibility and on the evolution of housing inequalities in general. But the complete absence of state policies to mitigate the negative processes and the severely reduced room for manoeuvre of municipalities imply that the negative effects will be unrestrained: the creation of mono-functional new neighbourhoods for inhabitants with homogenous social status - of low or high -, leading to the polarisation of the spatial-social fabric of cities.

Green policies in the housing sector (energy retrofitting of residential units, applying nature-based solutions and implementing densification) can mitigate or generate housing inequalities depending on the specificities of the national or local housing systems. The three main factorsof the green related housing characteristics can be summarized as 1) the withdrawal of market incentives due to capped utility prices, 2) marginalization of the room of manoeuvre of localities and 3) dominance of private ownership in housing.

Capping the utility prices

The cap on household utility prices in Hungary, applied since 2013, results in the lowest electricity and gas prices in Europe. This policy is considered as a major tool against energy poverty while is a major structural barrier to green development in the housing sector at the same time. While it lowers utility bills in the short term, it removes the financial incentive for households to invest in energy-efficient renovations (such as insulation, window upgrades, or heating modernization).

Thus, the level of residential energy efficient interventions is very low, as the investment cannot be motivated by market based financial calculations, except the times when public subsidies appear. Public subsidies were generous in the 2000s, but they concentrated on multi-family buildings built by industrialised technology. After 2010 subsidy programmes remained marginal and the focus shifted from multi-family buildings to family houses. While access to subsidies for multi-family buildings depends less on the financial capacity of the owners as organisational aspects matters more, for family houses the ability to co-finance is the crucial issue besides the capability to follow the administrative requirements.

Instead of encouraging long-term efficiency, the cap on household utility prices basically traps households in outdated, inefficient buildings, missing the opportunity for energy transition

through housing renewal, while simultaneously deepening social inequalities. Wealthier households, who tend to live in larger homes and consume more energy, gain greater absolute benefits from capped prices, when poorer households receive less benefit as they are the least likely to access renovation subsidies, leading to a widening gap in housing quality and energy efficiency.

Marginalization of the room of manoeuvre of localities

Another major issue is the systemic neglect of public and social housing in both housing policy and green transition initiatives. The public rental housing in Hungary is an ever-shrinking share of the total housing stock reaching about 2.4% in 2024. It is home to some of the most vulnerable populations, including low-income households, the elderly, and marginalized groups. Despite this, state-funded renovation programs and energy-efficiency incentives rarely, if ever, include public housing. Most subsidies or even retrofitting schemes are tied to private ownership or demographic conditions like childbearing. This means public and municipal housing units—often the least energy-efficient—are left behind, deepening the energy divide. The result is a structural policy failure: those most in need of improved housing and lower energy bills are systematically excluded from state-led green investment, reinforcing spatial and class-based inequalities. Without a targeted and well-funded strategy for public housing retrofitting, Hungary's green transition risks becoming not only incomplete but socially unjust.

A further constraint on green and inclusive housing development in Hungary lies in the weak land ownership position of municipalities. Unlike in many Western European countries, where local governments own significant amounts of their own resources (local tax revenue, property, etc.) urban land and can leverage it for social housing or sustainable development, Hungarian municipalities possess very limited land assets and authority. This severely reduces their capacity to initiate or control housing projects—especially in brownfield redevelopment, which in Hungary is largely driven by private investment with minimal public regulation –- resulting in market-led densification that favours private interests over social or environmental goals. Compounding the problem, Hungary lacks inclusionary zoning regulations—planning tools used elsewhere to require developers to include affordable or energy-efficient units in new projects. In the absence of such mechanisms, new urban development typically excludes lower-income residents, fails to meet climate targets, and deepens spatial inequality.

Dominance of private ownership in housing

97.6% of the housing stock in Hungary is in private hands, more than 90% of which is owner occupied. It means that the energy efficient retrofits have to be initiated, financed and implemented by private owners, no matter how poor or energy poor they are. There are no non-profit or public housing organisations that take the administrative and financial burden from the inhabitants. In addition, the multi-family housing stock, which is dominant in urban areas, consist of private condominiums and cooperatives for which the financial problems of their socially mixed residents is coupled with the organisational difficulties of decision-making. That is why the implementation of retrofits of any kind have a slower pace and further slowed down by the lack of state or local subsidy programmes.

The private rental market, while growing and reaching 8-9% nationwide and 15-20% in Budapest, remains fragmented, informal, and underregulated. Tenants face insecure tenancy, weak legal protections, and are entirely excluded from most renovation subsidies The split incentive between landlords and tenants discourages investment in energy upgrades, and where renovations do occur, rent prices might skyrocket and renovictions can follow, however this phenomena is not acknowledged yet in Hungary, most probably due to the relatively modest rate and dispersed nature of private rental properties. Given Hungary's weak tenant protections, these scenarios risk amplifying housing insecurity rather than addressing energy poverty.

While green gentrification — displacement driven by environmental upgrades — is a well-documented issue in Western European cities with large, flexible rental markets, its visibility is lower in Hungary. This might be explained by the high rate of homeownership and low mobility that limits rapid turnover. However, Hungary faces a quieter but equally problematic form of green exclusion, as public investments and retrofitting tend to concentrate in higher-income, owner-occupied areas, while marginalized communities — especially tenants — are left behind. This reinforces spatial and class-based green inequalities without triggering the visible conflict seen elsewhere.

8 References

Agrárminisztérium 2021: A zöldinfrastruktúra megőrzését és fejlesztését biztosító stratégiai keretek és fejlesztési célok, prioritások meghatározása, országos szintű alkalmazása (KEHOP-4.3.0-VEKOP-15-2016-00001 azonosítószámú projekt). Budapest.

Barnamezős és belvárosi használaton kívüli területek Budapesten 2023 december
https://budapest.hu/api/file/doc/Metodika.pdf
https://budapest.hu/api/file/doc/Buda.pdf
https://budapest.hu/api/file/doc/Pest-belso%C3%8C%C2%8B_2023.pdf
https://budapest.hu/api/file/doc/Pest-k%C3%83%C2%BCls%C3%85%C2%91-s.pdf

Bene, M., Ertl, A., Horváth, Á., Mónus, G., & Székely, J. (2023). A magyarországi lakóingatlan-állomány energiaigényének becslése*. Hitelintézeti Szemle, 22(3), 123–151.

Csite, A., Balás, G., Szendrei, Zs., Iváncsics, V., Obertik, J. (2016) Millenáris Széllkapu előzetes hatásvizsgálata és költség-haszon elemzése

Csizmadia, D et al. (2022): Promoting nature-based solutions in municipalities in Hungary. State of play for NbS in Hungary. Output 2 of the SRSP 2020 project 'Promoting green and blue municipal infrastructure'.

Csomós, Gy., Farkas, J.Zs., Kovács, Z., (2024) A GIS-based assessment of different income groups' access to multiple types of green areas in Budapest, Hungary. Habitat International– Volume 146, April 2024

Dél-Budapest fejleszthetőségének városrendezési-közlekedési hatástanulmánya
BFVT Kft. Budapest 2008

Ertl A., Horvath Á., Mónus G., Sáfián F., Székely J. Az energetikai jellemzők és az ingatlanárak kapcsolata. Statisztikai Szemle 2021 október 7.

EU Soil Strategy for 2030 Reaping the benefits of healthy soils for people, food, nature and climate, 2021 Brüssel
https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0699

Gerőházi É, Szemző H, Bekker B. and Kepes K. (2024). Comparative analysis of the subsidy schemes supporting the energy efficient renovation of residential buildings. Budapest: Metropolitan Research Institute. Nov 2024. https://mri.hu/en/wp-content/uploads/sites/2/2025/01/ECF-subsidy-systems-in-Eastern-Europe-for-workshop-%C3%89va-Ger%C5%91h%C3%A1zi.pdf

Green Policy Centre: Magyarország Harmadik Klímasemlegességi Előrehaladási Jelentése: https://www.greenpolicycenter.com/2024/06/12/magyarorszag-harmadik-klimasemlegessegi-elorehaladasi-jelentese-2024/

Hungarian Green Building Council. (2023). Épületfelújítási Kézikönyv. Retrieved from https://www.hugbc.hu/resources/docs/HuGBC_RetrofitHUB_HU_online.pdf

Koczóh Levente András: Ez van az ingyenes padlásfödém-szigetelés ajánlatok mögött.G7 2024 október 12.

Long Term Renovation Strategy of Hungary (2021) https://mehi.hu/en/news/the-hungarian-long-term-renovation-strategy-is-available/

András Lukács: Growing protests against priority investments in Hungary. In “Focus on Hungary” of Heinrich Böll Stiftung Prague https://cz.boell.org/en/2021/12/29/growing-protests-against-priority-investments-hungary, last access on 08.06.2025

National Energy and Climate Plan, Hungary (2024) https://energy.ec.europa.eu/system/files/2022-08/hu_final_necp_main_en.pdf

Nemzeti Fejlesztés 2030 – Országos Fejlesztési és Területfejlesztési Koncepció https://njt.hu/document/a6/a61d20144130000001_1.PDF

Nemzeti Fenntartható Fejlődési keretstratégia 2013 https://eionet.kormany.hu/akadalymentes/download/1/26/71000/NFFT-HUN-web.pdf

OECD (2023): Promoting Nature-based Solutions in Municipalities in Hungary.OECD ENVIRONMENT POLICY PAPER NO. 39 https://www.oecd.org/en/publications/promoting-nature-based-solutions-in-municipalities-in-hungary_d81fb09f-en.html pp.8.

Országos Területfejlesztési Koncepció 2005 http://www.terport.hu/webfm_send/OTK2005hun.pdf_%3b

Roadmap to a Resource Efficient Europe, 2011 Brüssel https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0571

Russo, A. and Cirella, G.T. (2018) “Modern Compact Cities: How Much Greenery Do We Need?”, International Journal of Environmental Research and Public Health, No. 15(10), p. 2180. https://doi.org/10.3390/ijerph15102180

Judit Siket: : Local self-governments’ competences in administrative procedures related to prioritized investments in Hungary. in Bulletin of the Transilvania University of Braşov Series VII: Social Sciences • Law • Vol. 17(66) No. 1– 2024 https://doi.org/10.31926/but.ssl.2024.17.66.1.1 last access on 08.06.2025.

Talajvédelmi Cselekvési Terv https://portal.nebih.gov.hu/documents/10182/1237425/Talajvedelmi+Cselekvesi+terv.pdf

Tanács, E. and Kissné Fodor, L (ed.)(2021): A hazai ökoszisztémák állapota. Az általános ökoszisztéma állapot-indikátorok országos térképezésének módszertana és eredményei. Agrárminisztérium. A_hazai_okoszisztemak_allapota_webre_osszefuzott.pdf

Tatai Zs. et al. (2017a) Budapest Környezeti Programja (Environmental Program of Budapest). https://budapest.hu/Lapok/2020/budapest-kornyezetvedelmi-programja.aspx

The EU compendium of spatial planning systems and policies European Commission, Luxembourg 1997 file:///C:/Users/acer/Downloads/the%20eu%20compendium%20of%20spatial%20planning%20systems%20and-gp_eudor_WEB_CX0397870ENC_002.pdf

Tóth, G., Jáger, V., Kovalszky, Z., Bóday, P., Ádám, D., & Kincses, Á. (2023). A magyarországi háztartások energiafogyasztásának jellemzői az orosz–ukrán háború árnyékában. Statisztikai Szemle, 118-144.

Unger, J. (1999) “Comparisons of urban and rural bioclimatological conditions in the case of a Central-European city”, International Journal of Biometeorology, 43(3), pp. 139–144. https://doi.org/10.1007/s004840050129

Wolf, S. et al. (2021) “The European Green Deal — More Than Climate Neutrality”, Intereconomics, NO. 56(2), pp. 99–107. https://doi.org/10.1007/s10272-021-0963-z

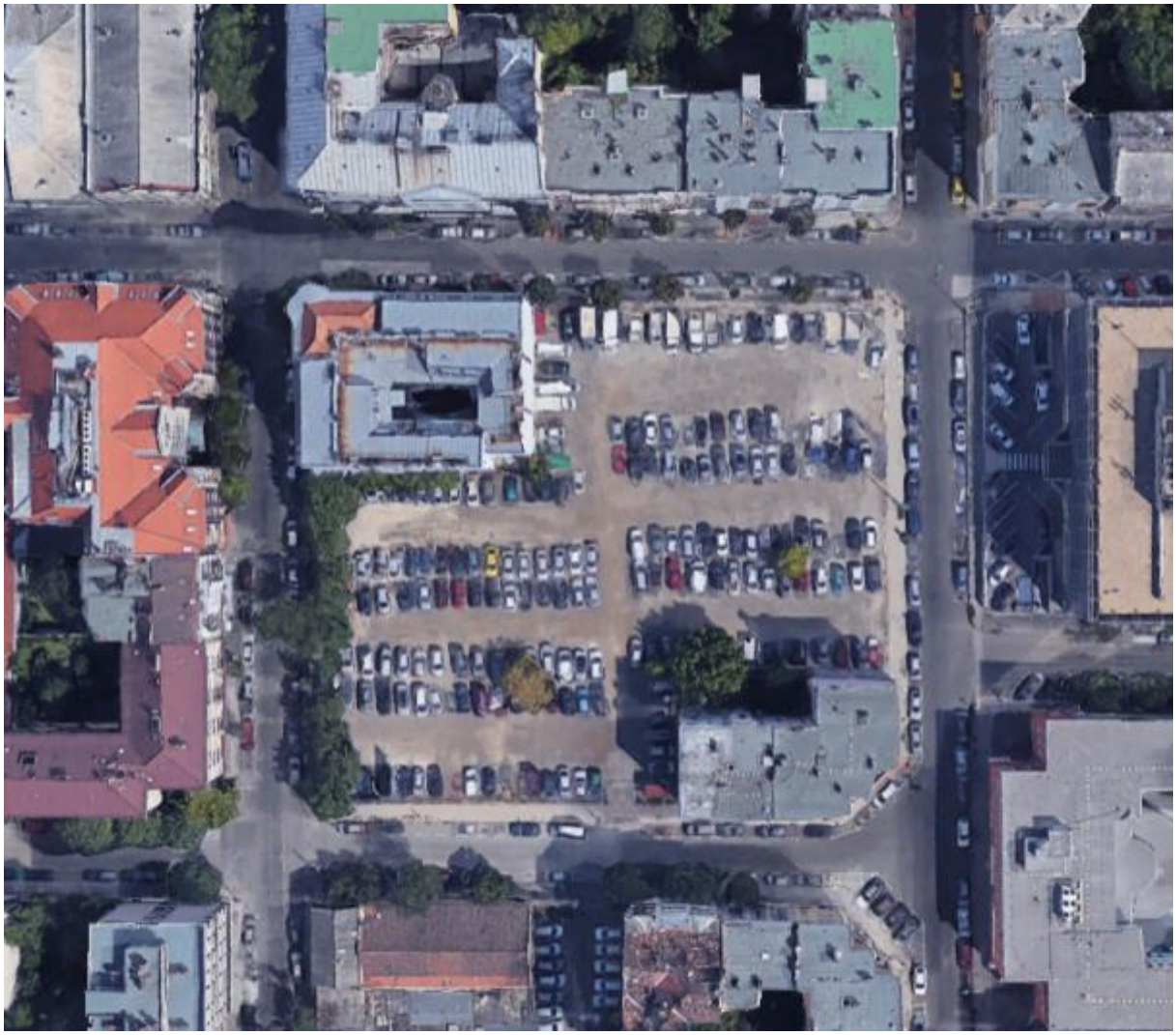
5. Nemzeti Környezetvédelmi Program 2026-ig szóló szakpolitikai stratégia, Technológiai és Ipari Minisztérium 2022
https://njt.hu/document/e2/e2b4EJR_570563-2X08424.pdf

9 Annex

9.1 NbS case studies in Budapest

Thurzó Park, Budapest. In the historic center of 13th District of Budapest, by HUF 707 million project, a 5000 square meter-large pocket park was developed in a former parking lot, instead of an office and housing building. The block was meant to be built in and development plan and the investor was already set when public outcry of the local community turned the future of the site in a different direction. The green investment, financed by the municipality's own budget, has resulted in an eco-friendly, custom-designed public park with recreational features and smart city services. Great achievement that 80% of the park is green space, covered by 3-storey vegetation and two thirds of the pavements are permeable. Rainwater is captured and used on site.[27] The new pocket park is very popular in the neighborhood, lacking enough public green space. The creation of the park is a unique example of a dense urban fabric where a park is created instead of a house in a built-up area. This transformation results in a loss of building rights and a consequent devaluation of the property. Park development, on the other hand, can lead to an increase in property values in its indirect surroundings. The only reason that significant gentrification could not be experienced is that the neighborhood is already higher class.

[27] https://www.budapest13.hu/beruhazasok/thurzo-park/



Picture HU 1. The area of Thurzó Park was a block with only 2 houses and open space used temporarily, as a parking lot (Google Earth)

Picture HU2. Thurzó PArk just after its opening in 2023.(Source: https://welovebudapest.com/)

Pünkösdfürdő park, Budapest. Metropolitan Budapest created a new public park in 2022 in the maintenance zone of the flood control dams of the Danube, in the 3rd District. The park was designed, constructed and maintained following the NbS guidelines.The green areas of the site, which are largely extensively maintained, not only provide recreational opportunities for park visitors, but also create new habitats for natural bird and insect life. The park showcases that nature, biodiversity and climate protection are our individual responsibility - many of the information panels help to raise awareness of environmental issues. The Pünkösdfürdő park is situated on the edge of a housing estate area of 122 thousand people, within a 300 meters radius, but not directly attached to the residential area. It is more likely of regional importance than local. Though, it sets an example for urban park development based on NbS principles.

Picture HU3. Large extensive green zones of Pünkösdfürdő park. It has a high ecological value and drains the stormwater on site (Photo Credit: Báthoryné Nagy 2023)

Renewal of Homokbánya (sand quarry) neighborhood, Kecskemét. The basic objective of the project is the environmentally, family and climate-friendly renewal of the public spaces of the Sand Quarry neighborhood, being a former military area, framed with former barracks, office buildings, residential buildings and green spaces. The project was financed 100% by the operative programs, and the total budget was HUF 800 million. The renewal of the green space is part of a broader urban development program to create a liveable and attractive urban sub-centre, to develop an urban green environment, the provision of attractive services and the use of thoughtful space. Besides the classic urban green spaces, the central one was developed using NbS in 2021, it drains and uses the rainwater, it keeps and replants as many trees as possible, it prefers permeable pavements and 3-storey vegetation. New park functions were introduced (e.g. bike park, bike cafe, playgrounds) to attract more visitors. Besides the reuse of old buildings, new housing areas (e.g. Boróka Park) with surrounding green areas are developed, step by step[28]. The neighborhood has a continuously growing population.

Miksa Déri Street, Budapest. The Municipality of the 8th District of Budapest renovated a section of Miksa Déri Street (between Nagyfuvaros and Fecske streets), costed 580 million HUF, financed by Budapest Metropolitan funding program called TÉR_KÖZ. The concept plan

[28] https://kecskemet.hu/zold-varos-kialakitasa-a-homokbanyan---aktualis and https://www.palyazat.gov.hu/hirek/peldamutato-projektek-valosulnak-meg-kecskemeten

for the green promenade was completed in summer 2020 with a real community design, in a multi-stage process, in cooperation with the residents. The street was renovated in 2022. Key objectives were to develop the entire street in line with pedestrian-friendly principles, and a landscaped promenade was created, which is suitable for play and thus connects the playground and the green area of the health centre. It was an important goal to make the new street feel like home to the residents and workers. Part of the rainwater is not discharged into the sewers, but into the extensive green spaces, which are then evaporated to cool the city.[29] Citizens of the neighborhood and visitors reaching the institutions and services frequently use the green street and the shady gathering places.

Picture HU4. Changing a street into multifunctional pedestrian green area, Déri Miksa utca, Budapest 8th District, 2022. 3-storey vegetation, semi-permeable pavements and resting places were developed. (Photo Credit: www.jozsefvaros.hu)

Csanády Street, Budapest. The Municipality of District 13 has extended the green area here to 624 square metres, with 16 more trees than before, 8 individual shade trees and 29 planting planters. The aim was to increase the proportion of green spaces in Újlipótváros, the dense and 'green-less' historic center, thus providing a climate-friendly environment for the people living there. Wider pedestrian walkways, more green spaces, rationalised pedestrian and vehicular traffic, rest areas and low-maintenance ecological green spaces were established. A special focus was also placed on creating barrier-free access. The development affects a green network axis of urban structural importance and is therefore in line with the pedestrian-friendly concept of the capital. The municipality spent HUF 490 million on the Csanády

[29] https://jozsefvaros.hu/otthon/varosfejlesztes/deri-miksa-utca-megujitasa/

promenade green project, using only its own resources. With the creation of the promenade, the parking regime has changed. Instead of 146 parking spaces, 135 regular parking spaces have been created, 9 of which are for disabled persons along the entire stretch.[30] The street was a popular pedestrian access before the project was completed. Due to the renewal slight gentrification can be noticed as some new shops and cafes opened, with a terrace to the new public space, in the last year.

Picture HU5. Street greening in Budapest, 13th District, Csanády Street, in historic neighborhood 2022. Perennials, trees and rainwater drainage surfaces were placed instead of parking places (Photo Credit: Báthoryné Nagy 2023)

Népszínház Street, Budapest. Another street greening project from Budapest with similar principles - enlarge green areas, provide shade, manage stormwater, develop walkable surfaces and places for community gathering. Unlike the sports in District 13, this neighbourhood has a lower social status population. According to a survey[31] the green islands on Népszínház Street are mainly used by outsiders. Local residents do not like the green lanes, they are considered “untidy, ugly and out of place”. The areas around the meeting places are more littered and noisy, so locals do not like them either.

[30] https://kozszolgaltato.bp13.hu/hirek/a-csanady-utca-kozteruleti-es-zoldfeluleti-fejlesztese/
[31] Several stakeholder interviews were made in September 2024, by a student project for urban design, carried by urban system engineer students at MATE University, Budapest. It is available in draft.

Picture HU6. Green islands and community gathering points in Népszínház street. (photo Credit: Báthoryné Nagy 2024)

In Hungary, there is no comprehensive research on the relation between green space supply or development and housing prices. In this field we either rely on the findings of international research or local, small scale studies, basically focusing on one block. The value of housing in relation to public spaces and urban green spaces proximity to public and urban spaces is inversely proportional to the price per square metre of the property, the closer they are to the park, the more expensive they are[32]. International studies have shown how the size of the park, its proximity to housing, has a direct impact on house prices. The larger the park and the closer it is, the more expensive the property price[33]. Protection status of the park, safety issues and general value of the streetscape also affects housing prices positively.[34] The view of a park from the window has also high influence on property value [35] For parks, they have shown a significant difference between the value of a nearby dwelling and the value of the directly overlooking a park[36].

[32] Morancho, 2003; Brander-Koetse, 2011; Luther 2003
[33] Crompton, 2001; Neutusil, 2001;
[34] Mourato et al., 2010, Luther, 2003
[35] Bourassa et al. 2004
[36] Jiao-Liu, 2010; Luttik, 2000; Jim-Chen, 2009

In terms of property value growth percentage, there is a wide variation between the international studies - there are values between 1.9% and 2.9%, but there are empirical estimates between 10 and 16.88% as well[37]. Based on the literature it can therefore be concluded that urban green space development can increase the value of properties in the area, even significantly.

Relevant for the Budapest case study is the preliminary impact assessment for Podmaniczky Park prepared by the Levegő Munkacsoport in 2016. In their study they estimated a 10% increase in value for areas within 200 metres and a 3% increase for areas between 200 and 500 metres.

The Millenáris park Budapest is an investment, in which, in both Phase 1 and Phase 2, research was carried out to see the effect of green space development in housing prices. Millenáris park was a brownfield development, Phase 1 finished in the year 2000, in which a former industrial area embedded in the historic urban fabric was turned into a public park and a cultural hub with museums, event halls, cafes and restaurants. Millenáris Park itself has had a positive impact on property prices in the surrounding residential area even only after the announcement of the renewal.[38] It was more likely a catch-up, real estate prices of the neighborhood could reach the same level as the district's property prices, by the development. So gentrification of the area was part of the strategy. According to the KSH Real Estate Data and Consumer Price Index and the FHB Housing Price Index, in 2001 (the year of the park's construction), the prices of the surrounding apartments increased by 13.6% per square metre[39]. This positive impact data shows that this positive effect was lost after two years (after which there was a 2% decrease every 10 metres after that), presumably as a result of the dense programme offer and the very intense use of the site (noise, traffic, litter, crowd). Other parks were also examined during the same

Phase 2 was Széll Gate Park (Széllkapu Park) in 2020, which is a renewal of some parts of the 20-year old park and significant enlargement of the green space by demolition of the former buildings of the Ministry of Industry. The building site, attached to Margit Boulevard, was turned into an underground parking for 500 cars. On top of the parking lot a 2,6 hectare-large ‘roof garden’ was developed for public use, slightly elevated from ground level. According to the benchmark forecast, the area base for the price increase was the 5-minute walk area, where a price increase of 5.9% was calculated. An additional 6.3% increase with park views and a 4% loss in the price equalisation zone, giving an overall increase of 12.2% and 1.9%. The total real estate revaluation impact of the investment was estimated at HUF 16.535 billion.

[37] Csite et al. 2016
[38] Takács 2016
[39] Takács 2016

Picture HU7. Széll Gate Park in the urban area. (Photo Credit: www.gwd.hu)

How protected areas and urban housing supply are related, there is no relevant research on that field either. Despite the strict regulation on building and land use, living close to protected areas is attractive because the natural environment meets the recreational needs of the residents, in addition to nature conservation (see Normafa, Naplás Lake or Farkaserdő in Budapest).

Briefly, the impact of national or local policy is not clearly traceable on the relationship between green space and housing quality and welfare services. This link is being explored only at the small scale, during the implementation of local strategies or development of a project. But in all cases, there is a complete lack of post-implementation monitoring in this respect.

9.2 Transposition of the European legislation on energy efficiency of buildings

Hungary mostly missed the deadlines of the transposition of the European legislations with regard to the Energy Performance of Buildings and Energy Efficiency Directives. Nevertheless, all the required transpositions were sooner or later completed, except for the latest versions of EPBD and EED.

	European level		**Hungarian implementation**
2002	Energy Performance of Buildings Directive (EPBD) https://eur-lex.europa.eu/eli/dir/2002/91/oj/eng	The 2002 EPBD did not impose common, precise numerical targets. It required each Member State to develop a national methodology for calculating the energy performance of buildings. It required members states **to set national minimum requirements on the energy performance of new buildings and only existing buildings with a total useful floor area over 1000 m^2 that are undergo major renovation[40].** Member States may decide not to set or apply the requirements for the residential buildings (new and existing) which are intended to be used less than four months of the year.	The transposition of this directive was a fundamental step to lay down the technical requirements of new construction and major renovation. (Finally the conditions were stricter in case of major renovation than was required by the EPBD.) The results were reflected in the 7/2006 TNM decree, which became the major guiding legislation for two decades. 176/2008 government decree on the energy certificates that became obligatory in case of sale and long term rent..
2010	EPBD revision https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32010L0031	The 2010 EPBD did not impose common, precise numerical targets but it included some changes with respect to the 2002 version. It established mandatory national minimum requirements on the energy performance of new buildings and **only existing buildings that are undergo major renovation, regardless of their surface area.** Mandatory national minimum requirements have to be updated every five years and are set with a view to achieving **cost-optimal levels** Member States shall ensure that: by 31 December 2020, all new buildings are nearly zero-energy buildings; and after 31 December 2018, new buildings occupied	New methods for calculating the cost-optimal level of interventions that are crucial for new construction (Nearly Zero Emission buildings). The serious requirements for new constructions were applied with a constant postponement, and are obligatory from January 2024.

[40] According to the Directive: "*Major renovations are cases such as those where the total cost of the renovation related to the building shell and/or energy installations such as heating, hot water supply, air-conditioning, ventilation and lighting is higher than 25 % of the value of the building, excluding the value of the land upon which the building is situated, or those where more than 25 % of the building shell undergoes renovation*"

		and owned by public authorities are nearly zero-energy buildings Member States may decide not to set or apply the requirements for "*residential buildings which are used or intended to be used for either less than four months of the year or, alternatively, for a limited annual time of use and with an expected energy consumption of less than 25 % of what would be the result of all-year use*".	
2012	Energy Efficiency Directive (EED) https://eur-lex.europa.eu/eli/dir/2012/27/oj/eng	The 2012 EED set out a number of energy efficiency targets, referring not only to the residential or building sector but more broadly to all sectors. **The EU aimed to reduce energy consumption by 20% by 2020. Each Member State was required to set indicative national energy efficiency targets.** Member States also had to renovate each year at least 3% of the total floor area of centrally owned public buildings.	The transposition was governed by the 122/2015 government decree. The main result of the transposition of this directive was the establishment of the Energy Obligation Scheme in Hungary from 2021. The transposition also set the formal requirements of energy audits.
2018	EPBD revision https://eur-lex.europa.eu/eli/dir/2018/844/oj/eng	Each Member State shall establish **a long-term renovation strategy to support the renovation of the national stock of residential and non-residential buildings, both public and private, into a highly energy efficient and decarbonised building stock by 2050**, facilitating the cost-effective transformation of existing buildings into nearly zero-energy buildings, in particular by an increase in deep renovations. The long-term renovation strategy shall include indicative milestones for 2030, 2040 and 2050, and specify how they contribute to achieving the Union's energy efficiency targets in accordance with Directive 2012/27/EU.	The National Energy and Climate Plan was completed in 2020 and was updated since then. The Long-term Renovation Strategy was completed in 2021 for the first time. The requirements for major renovation were relieved a bit from November 2023. The 7/2006 TNM decree was replaced by the 9/2023 ÉKM decree.
2023	EED revision https://eur-lex.europa.eu/eli/dir/2023/1791/oj/eng	2023 EED defines higher targets for energy efficiency and introduces the "Energy-efficient first principle" as a key element, meaning that energy efficiency must be prioritised by member states across all policy and investment decisions **Public bodies at national, regional and local level should fulfil an exemplary role as regards energy efficiency.** Each	Not yet transposed.

		Member State shall ensure that at least 3 % of the total floor area of heated and/or cooled buildings that are owned by public bodies is renovated each year to be transformed into at least nearly zero-energy buildings or zero-emission buildings **Member States shall establish and achieve a share of the required amount of cumulative end-use energy savings among people affected by energy poverty, vulnerable customers, people in low-income households and, where applicable, people living in social housing**	
2024	EPBD revision https://eur-lex.europa.eu/eli/dir/2024/1275/oj/eng	**2024 EPBD objective is the reduction of greenhouse gas emissions from buildings within the Union, with a view to achieving a zero-emission building stock by 2050** **Member States shall establish a national building renovation plans that also includes a roadmap with targets and indicators, including the reduction of the number of people affected by energy poverty.** Member states must implement measures to reduce average primary energy consumption of the national residential building stock by at least 16% compared to 2020 by 2030; and by at least 20-22% compared to 2020 by 2035. Member States shall ensure that at least 55 % of the decrease in the average primary energy use referred to in the third subparagraph is achieved through the renovation of the 43 % worst-performing residential buildings	Not yet transposed. No information on the National Building Renovation Plan or the implementation of the concept of Renovation Passports. As Hungary decided to opt out from ETS2, the relevance of the Social Climate Plan is negligible.

9.3 List of interviews

In addition to the desk research interviews were carried out in May/June 2025, the details of which can be seen in the following table.

Institution	**Interview date**
Regional Energy Research Centre (REKK)	27 May, in person
Habitat for Humanity, Hungary	30 May, in person
Solidarity Economy Center, Budapest	30 May, in person
Budapest University of Technology and Economics, Department of Construction Materials and Technologies	10 June, online
M-Teampannon Architecture (spatial planning)	12 June, online
Chief architect of Budapest	13 June, online
Urban Planning company of the Municipality of Budapest (BFVT)	17 June, online