



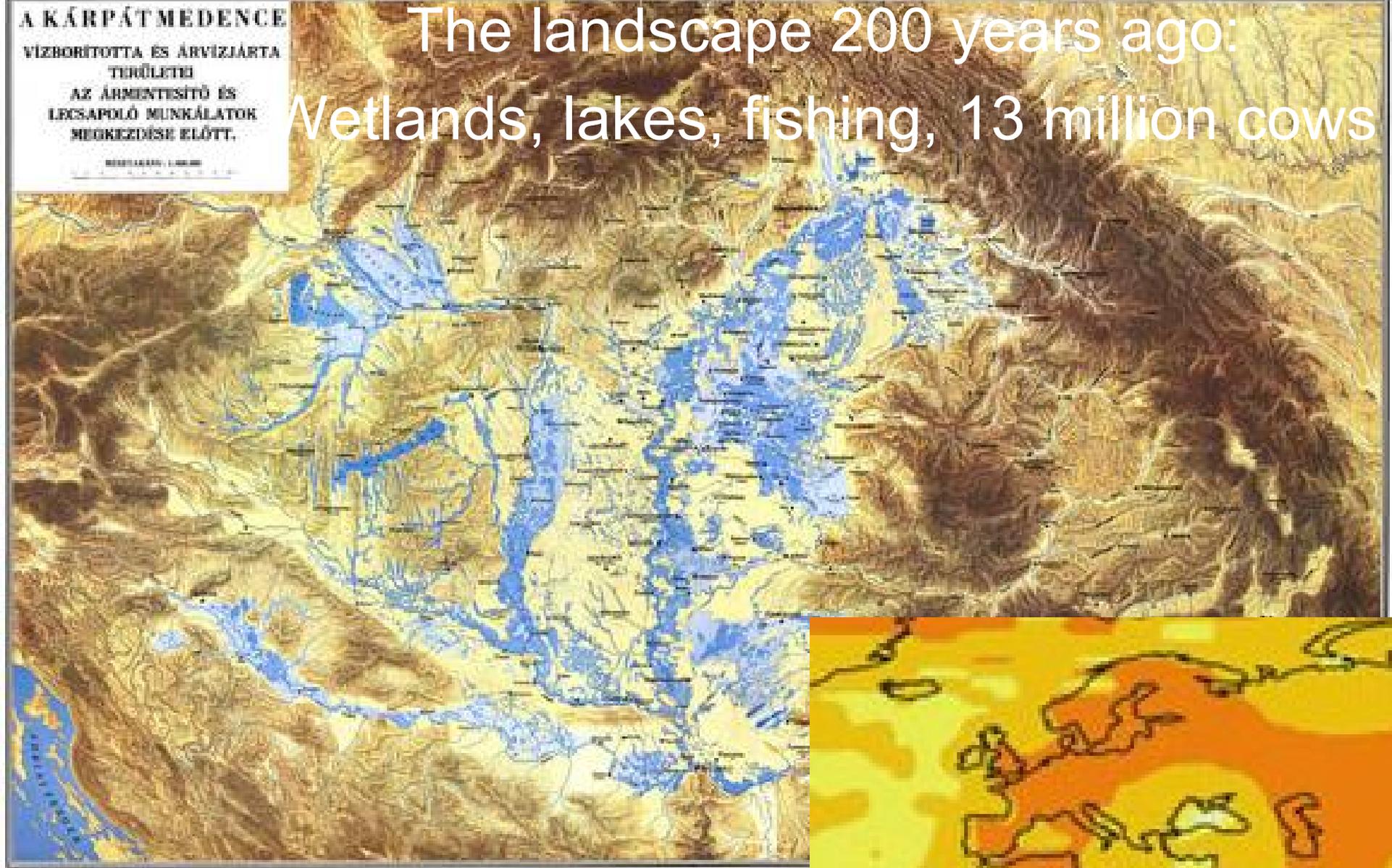
# Affordable, Healthy & Ecological Housing in Hungary

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Vice President, Chamber of Hungarian Architects

A KÁRPÁT-MEDENCE  
VIZBORÍTOTTA ÉS ÁRVIZJÁRTA  
TERÜLETÉNEK  
AZ ÁRMENTESÍTŐ ÉS  
LECSAPOLÓ MUNKÁLATOK  
MEGKEZDÉSE ELŐTT.

The landscape 200 years ago:  
Wetlands, lakes, fishing, 13 million cows



Floods at springtime, droughts at summer

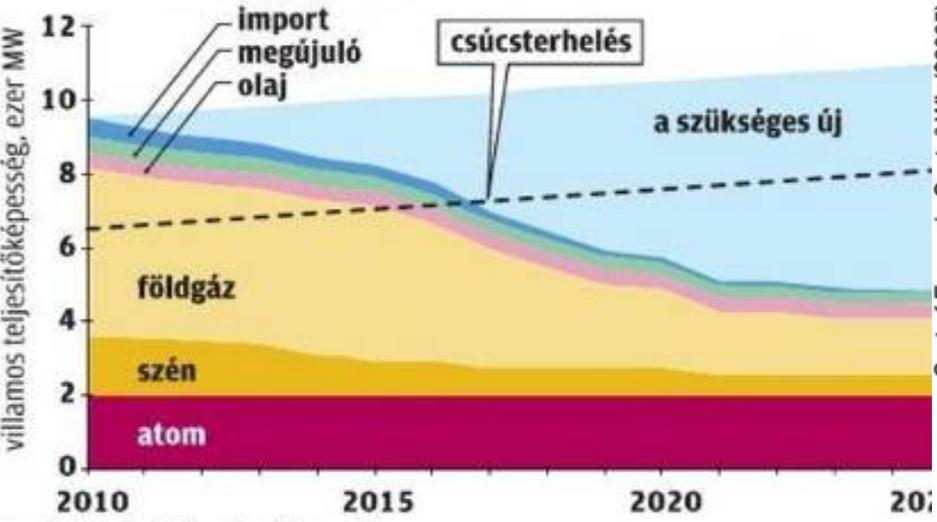
UNECE Conference April

the upcoming of desert zones from South Europe

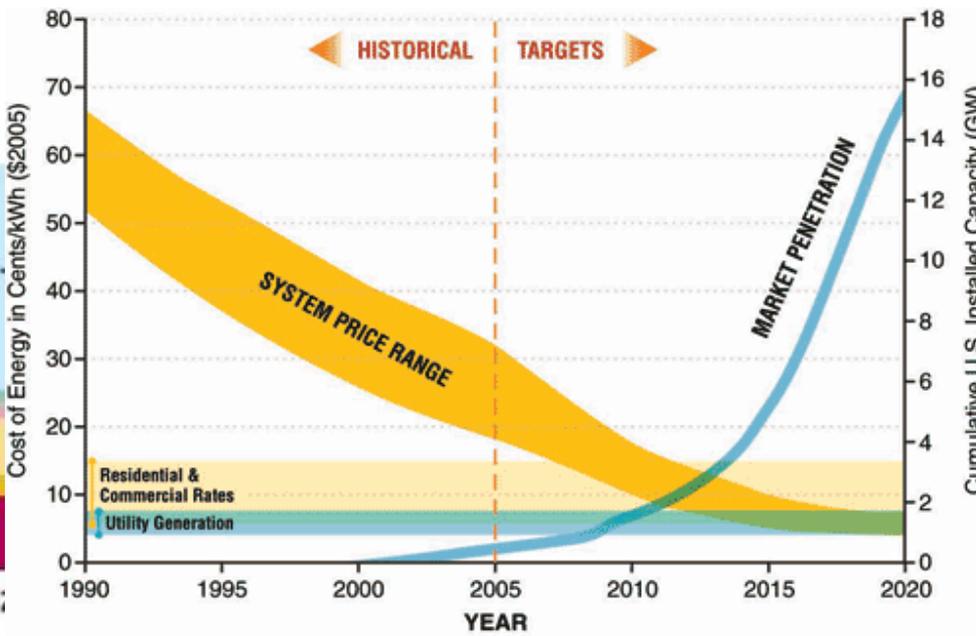
# Facts, 2009-2010

- the Hungarian Government asked the EU to accept the moderation of the emission reduction goals from 20 % down to 13 % till 2020
- a dependence of over 85 % of russian gas
- the summer temperatures at Budapest will rise in 20 yrs to that of today's Taskent, with over 40-45 C
- between 2007 and 2013 Hungary can use a 83 milliard HUF (330 million EUR) subsidies from the EU, and in the past 2 years only 2 milliard HUF was used
- a new nuclear block is to be built for 10 mrd EUR.
- Handicap for renewables and decentralised energy and waste water treatment systems, with favours to great, centralised systems, resulting high costs
- Strong lobbies for fossile and nuclear energy
- Great civil interest for information
- Eco houses built by peripheric groups of civilians
- Insufficient subsidies and credits
- Slow and bureaucratic EU project financing

### Hazai erőmű-építési szükséglet



Forrás: Mavir / Népszabadság-grafika



Market Sector	Current U.S. Market Price Range (¢/kWh)	Cost (¢/kWh) Benchmark 2005	Cost (¢/kWh) Target 2010	Cost (¢/kWh) Target 2015
Residential	5.8-16.7	23-32	13-18	8-10
Commercial	5.4-15.0	16-22	9-12	6-8
Utility	4.0-7.6	13-22	10-15	5-7

### Official energy prognosis

- continuous growth of energy demand
- fossiles running out
- favoured nuclear energy
- underestimated renewable potential

### Grid parity – a chance for a sustainable energy policy

- price of Photovoltaic systems sinks under grid prices
- new perspectives for cheap off grid systems harmonised with smart grid
- Hungary reaches grid parity in 2016

# Sustainable solutions

- Climate change
  - Sustainable urban planning
- Effects of the EPBD directive
  - definitions of „Nearly Zero” energy buildings to be made in national competence:
    - A+ Low energy buildings: 40-80 kWh/m<sup>2</sup>a heating demand
    - A++ passive houses
    - Autonomous houses
  - Energy efficiency programmes, affordable solutions
  - Social housing programme from 2012 – pilot projects, including housing projects for low income roma minority
- Energy crisis, financial crisis
  - Cost effectiveness, the use of Life Cycle Cost Analyses (LCCA)
- Education
  - EDUCATE programme for sustainable environmental design, as guideline

A+	>55%	Fokozottan energiatakarékos
A	56-75%	Energiatakarékos
B	76-95%	Követelménynél jobb
C	96-100%	Követelménynek megfelelő
D	101-120%	Követelményt megközelítő
E	121-150%	Átlagnál jobb
F	151-190%	Átlagos
G	191-250%	Átlagost megközelítő
H	251-340%	Gyenge
I	341<%	Roszs

***Q1. What are the main tools (legislative, financial, etc) employed by your country to promote access to affordable, healthy and ecological housing?***

- Subsidies for energy-efficiency for new and refurbishable houses following the EPBD (EU Directive for Energy Efficiency). It gives a maximum of 10% support to costs.
- Healthy housing is promoted by education of students and professionals. In the new subsidies system, there is a possibility to gain more support for ecological solutions using a bonus system that evaluates building construction and performance.
- Affordability: the EPBD directive anticipates the task of cost effectiveness
- The government is preparing a social housing project, the Home Creating Programme and the Green Economy Programme within the Széchenyi-Project (an economy boost programme) to be started in 2012. The number of flats for rent in Hungary is 9 %, one of the lowest in Europe. The government wants to boost it up, to start with 5000 social flats, and within a few years end up near 15-20.000 per year. These flats are planned to be built as sustainable, at **low** construction and **running costs**. These flats offer dwelling for the low-income groups, also for roma minority.
- The Chamber of Architecture is preparing such legislative tools that allow to use local and natural materials for construction, and to demolish existing legal barriers to help decentralised infrastructure, such as local energy and sewage systems instead of favouring centralised megastructures.
- The document of the National Architectural Policy is being prepared, will be ready by May 2011. It contains the major points of sustainable and affordable housing.

## ***Q2. What are major gaps (legislative, institutional, financial) in your country in ensuring access to: Affordable housing***

### **Crisis**

- the financial crisis slowed down building industry. Low incomes, high unemployment, almost uncontrolled free market system with extremely high prices of flats and rents. Lack of affordable credits. 10 % of the credit-owners on their flat cannot pay the increasing credits caused by the rising of credit rates, 100.000 of them may lose their property. Another 100.000 have collected huge debts in house running costs, their flats may also go under the hammer

### **Homeless people**

- There are a great number of them in the cities, and there is no satisfactory solution for it yet. As the new Constitution is being prepared, a great step forward could be to declare the right of dwelling as a fundamental right.
  - Overregulation. Slow and bureaucratic building permission process.
  - Lack of non-profit housing systems such as housing cooperatives having common property.
  - Young people have a little chance to get an affordable dwelling. The greatest part of their income goes for renting costs.
  - Overtaxation and bureaucracy: a more simple tax system and a simple worker registration is needed, and thus the building industry could employ more workers.

## ***Q2. What are major gaps (legislative, institutional, financial) in your country in ensuring access to: Healthy and ecological housing***

### *Healthy housing*

- Every 5<sup>th</sup> citizen lives in big prefabricated block of flats, built in the '70-'80 years. Many of them are badly insulated, this causes unhealthy air conditions.
- A great number of Roma minority lives in substandard dwellings
- Homeless people are often in bad health condition, after many decades that passed without any tuberculosis in the country the syndromes have appeared again among them.

### *Ecological housing*

- The 89/106 EU-directive about the use of proved building materials led to a legislation that can be misunderstood by building authorities so that in many cases they favour industrial products for construction and provide handicap for the use of local materials such as clay, earth, straw or recycled materials. A correction process has begun in Brussels and on national level, too.
- Insufficient education of sustainable architecture at all levels, including postgraduate and professionals.
- The second highest cost of households after food is dwelling - the 25 % of all costs, including energy as the biggest part.

**Q3. What could be the added value of a possible framework convention on affordable, healthy and ecological housing in the UNECE region?**

- *(a) Increased political importance and visibility of the housing sector both at national and international levels* x
- *(b) Development of a unified and agreed international framework to address major housing challenges in the region* x
- *(b) Provide guidance for the development of coherent national housing policies* x
- *(c) Strengthened implementation of sound national policies for affordable, healthy and ecological housing* x
- *(d) Provide a platform for exchange of international experience and best practices and mobilization of assistance to address major housing challenges at the national level* x

**Q3. What could be the added value of a possible framework convention on affordable, healthy and ecological housing in the UNECE region?**

(e) Other:

- promoting the fundamental right of dwelling, as it exists in a few European countries, with best practices and help to implement them.
- there is an EU project (EDUCATE) with the participation of seven architectural faculties from the EU (Italy, Spain, UK, Belgium, Hungary, Germany) that is preparing a Pedagogical Framework and a Knowledge Base for improving the education of Sustainable Environmental Design for undergraduates, graduates, postgraduates and for Continuous Professionals Development (CPD). The project will close in 2012, and could be widely promoted in the EU or worldwide.
- promoting non-profit housing systems with community property, such as dwelling cooperatives, that help to push down speculation on housing market.
- promoting best practices of social housing systems e.g. in Austria, where there is a state support system that gives subsidies or tax advances to those who build low budget and low running cost eco houses (Revisionsverband).
- promoting legislative and financial solutions that help locally owned, decentralised energy-production and sewage treatment.

***Q4. How a possible framework convention could help your country to address gaps in the areas of affordable, healthy and ecological housing?***

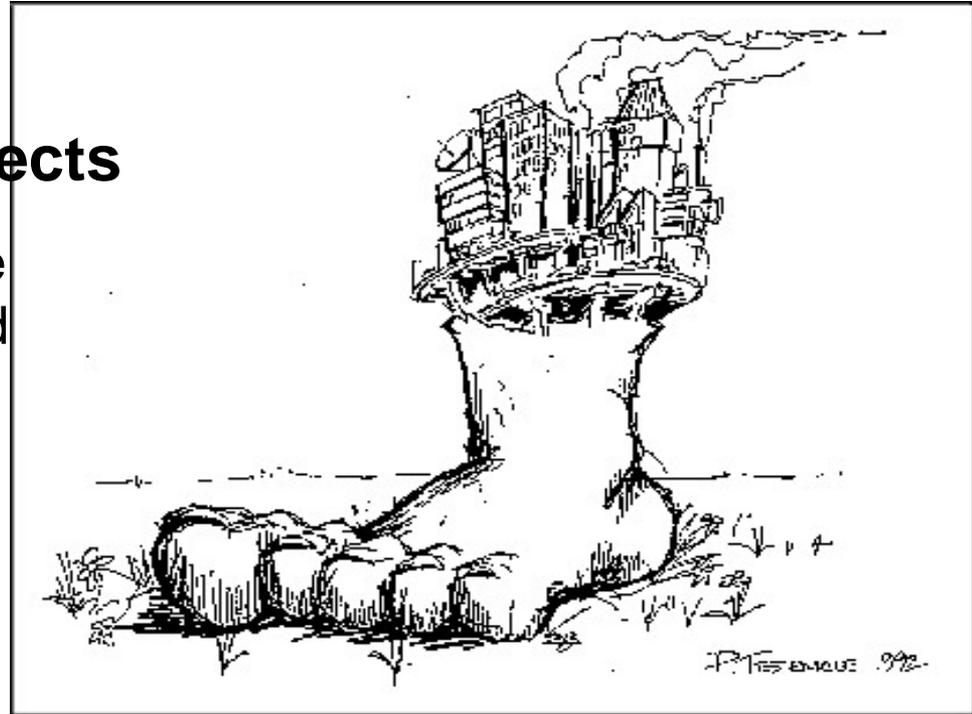
- It could help on focusing attention to architecture, housing and sustainability. If we sign international agreements, we generally tend to keep them.

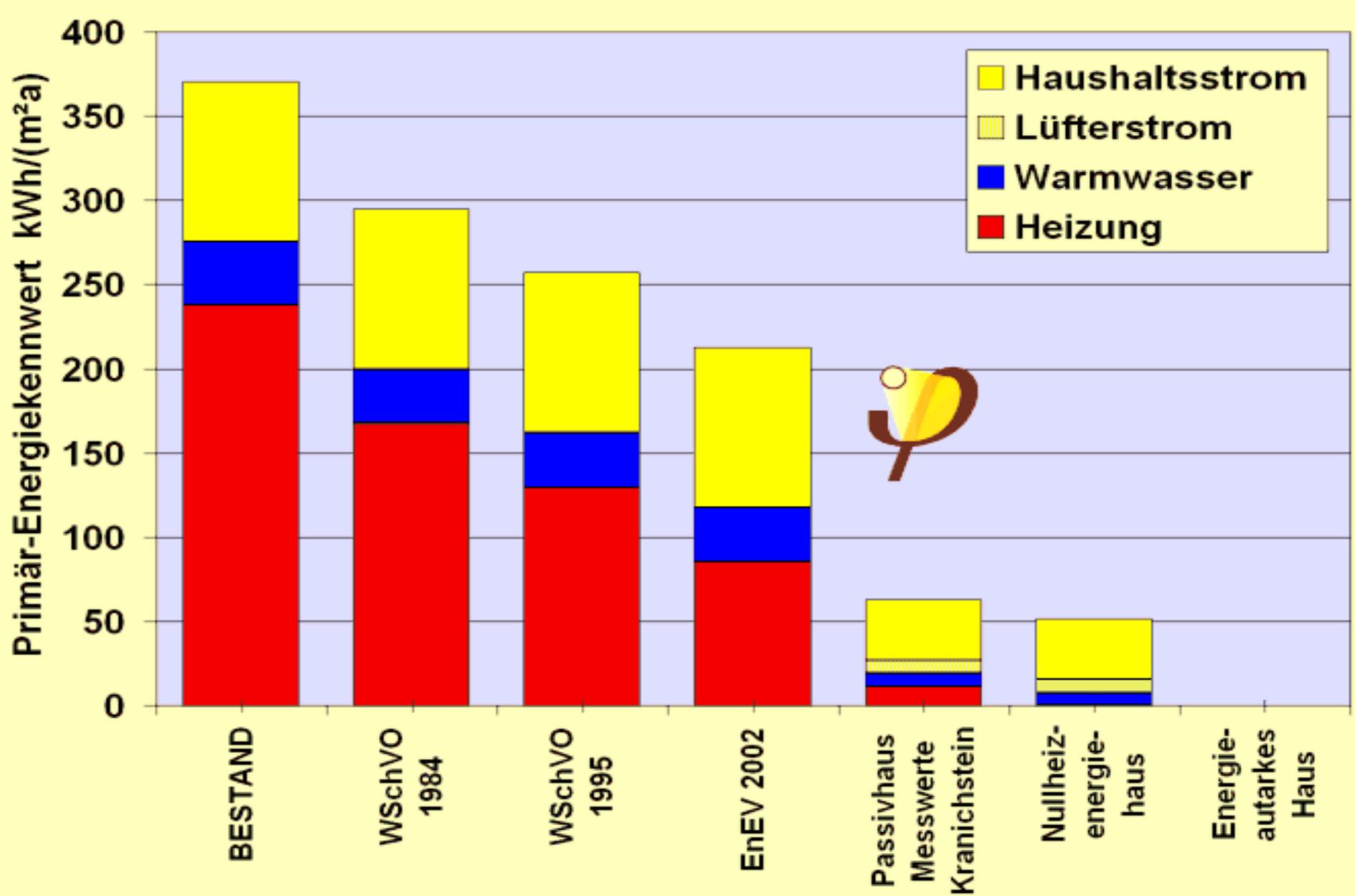
***Q5. What are the factors that may hinder the implementation by your country of a framework convention on affordable, healthy and ecological housing?***

- First of all financial possibilities, because politicians are rather aware of the need for affordable housing, and if so, then it must be also healthy and ecological. If the crisis ends, a major change can be realised from 2012
- Second: best practices are badly needed. A few pilot project could help a lot.

# Goals of the Hungarian Chamber of Architects

- Setting up standards for the outcome of education of sustainable design and planning
- Deregulation, favour to low impact, natural and healthy building materials
- Speeding up legislation of energy-efficiency, passive and low energy standards
- Support of local, decentralised systems of energy and waste water systems
- participation in the housing, energy and rural development policy of the government
- Connecting social housing with sustainability and low building running costs





# Performance of an Autonomous House

- An autonomous, or off-grid house can be made on the base of a low energy or passive house. It can reach up to 90 % of reduction of heating energy, and it is covered by its own renewables.
- The average peak electricity demand of a regular family of four is 6-10 kW – with energy efficiency can be reduced to ~ 3 kW, this can be covered by a hybrid system, or PV, and the energy balance is positive.
- Zero CO<sub>2</sub>-emission, or Carbon-neutral building
- Zero Energy Building
- Embodied Energy Content is low; uses only renewables
- the users lifestyle including traffic stay within their ecological footprint
- „Water-efficient”: the daily demand on drinking water – 140 l/person - is reduced by 50-60% down to 70 liters:
  - with an own well 100 % independence can be reached:
  - utilization of rainwater, greywater recycling and water-saving systems
- its emission of waste water is smaller by 30-50 % – at certain places the price of canalisation reaches 4 EUR per m<sup>3</sup> and could be reduced to 2 EUR or zero.

# Prices of an Autonomous House

A low energy or a passive house with a size of 130 m<sup>2</sup> can be built from 30-33 million HUF (120.000 EUR). According to German data the extra cost of a passive house is round 10 % .

To reach a self-sufficient, autonomous house, 5-6 million HUF(20.000 EUR) investment is needed. The self-sufficient electricity system costs half of it. (1 kW = 1 Million HUF).

Using subsidies the extra investment can be halved, and so it can be only 10 %  
So with 10 % extra investment and 10 % subsidies a sustainable off-grid house can be built

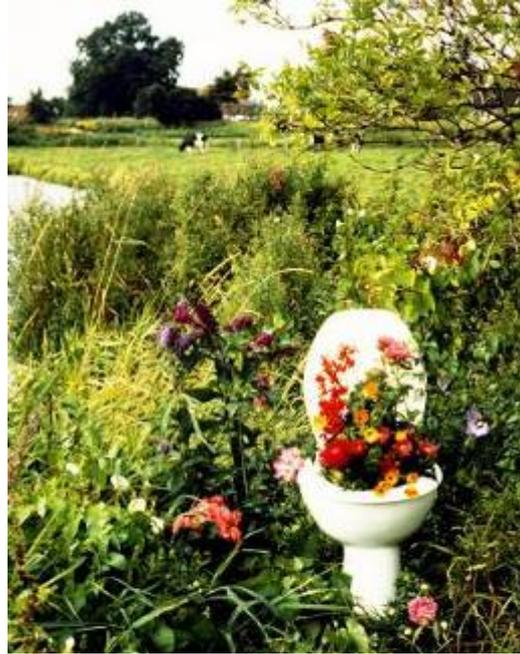
The investment can be returned within 10 years from the low running costs.

By reaching grid parity the time of returning investment can sink under 5 years!

If the housing is made in groups or blocks, costs can be reduced with 10 %

If the housing is made with refurbishing of former industry zones, an extra cost of 10% can be calculated

# 1 liter WC Mini Flush



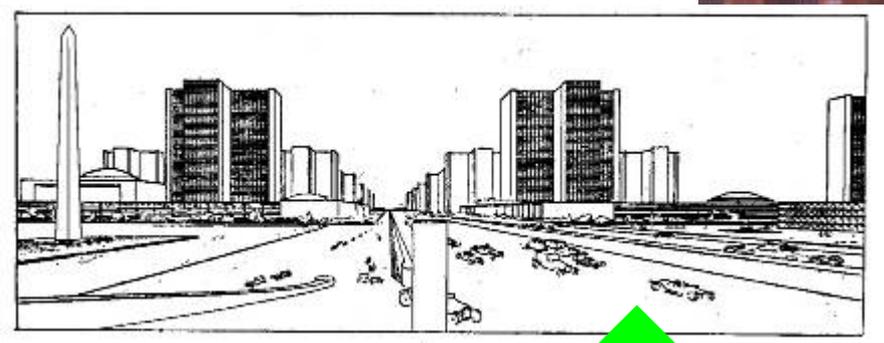
# Dry pisseoire



Flushing with used handwash water:  
1 handwash = 2 l water  
2 l water with low flush toilets and dry  
pissoires = 2 flushes  
Water saving rate: 60-90%  
(Toto – Japan)  
With composting toilets: 100 %





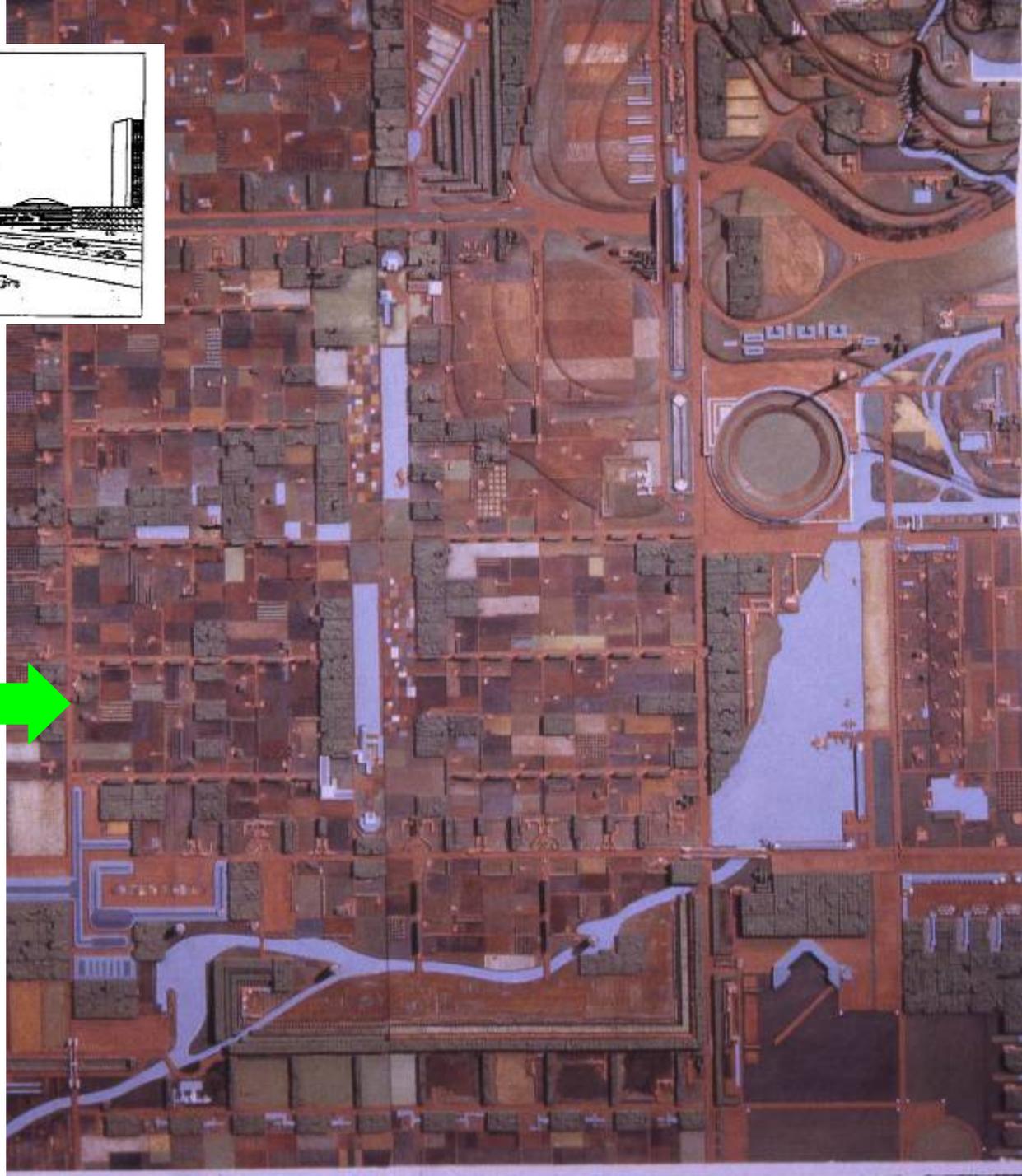


Le Corbusier's vision of a mega-city from 1922:

- 5 million inhabitants
- zone planning: industry, dwelling, commercial zones
- mass traffic
- 40 m<sup>2</sup> flat sizes
- 20 storey blocks

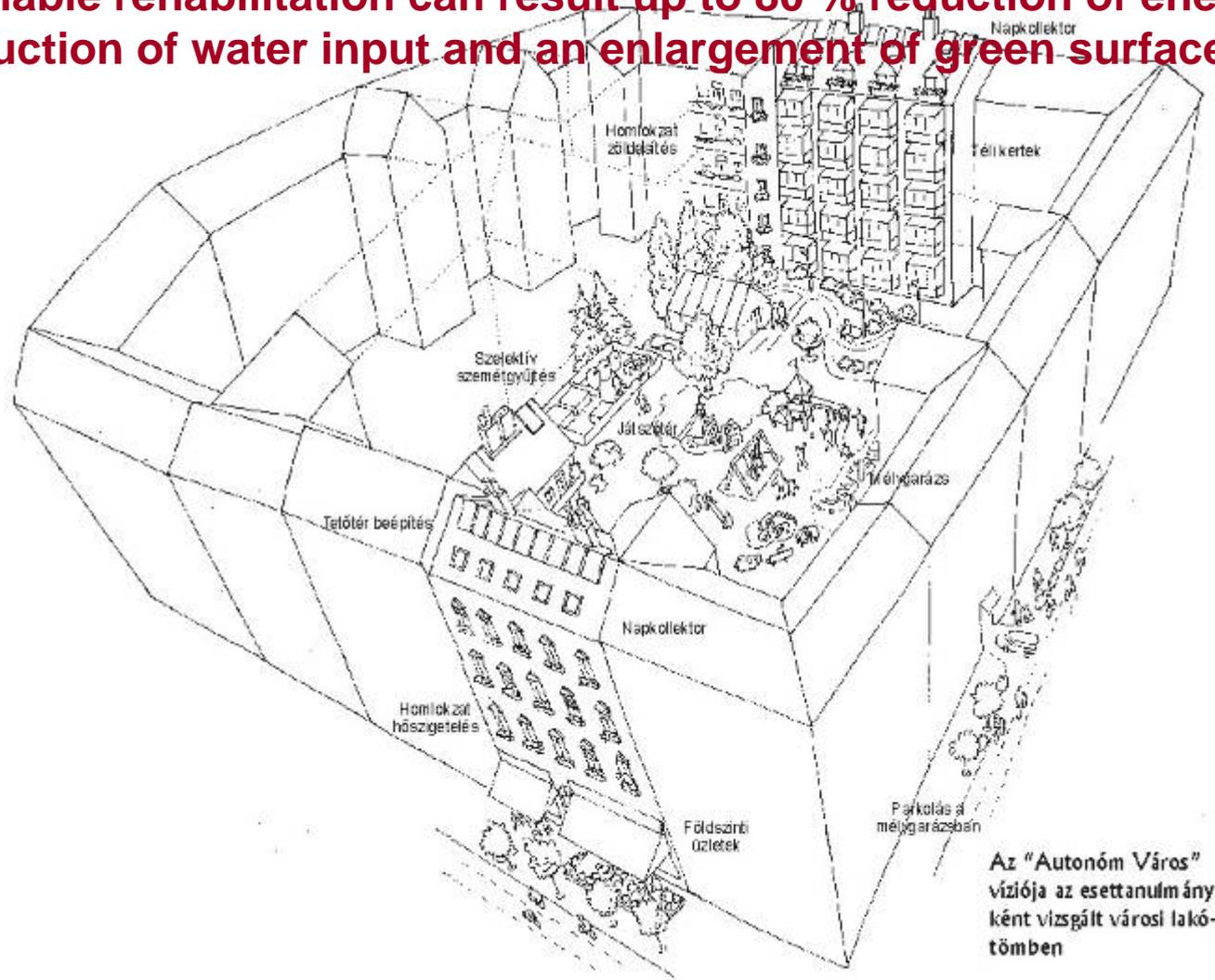
F. L. Wright's vision of a **Decentralised** garden city from 1930:

- 5000 inhabitants
- inside of the city only pedestrians
- 4000 m<sup>2</sup> individual sites
- work and living at the same place



# Autonomous City

settlements eco-efficiency and rehabilitation study in two districts of Budapest  
a sustainable rehabilitation can result up to 80 % reduction of energy input,  
50% reduction of water input and an enlargement of green surfaces up to 70%

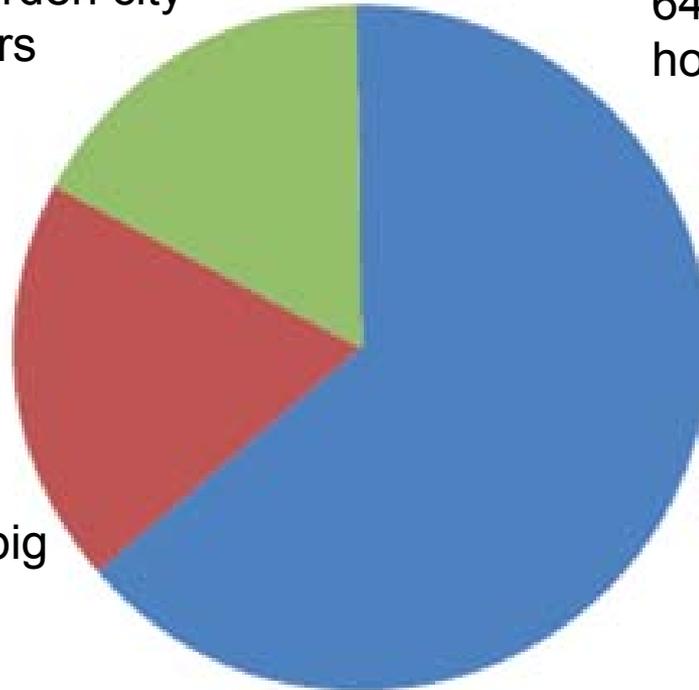


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Research of the Independent Ecological Centre 2004

17% city, garden city  
blocks, others

64% single family  
houses



19% block of flats in big  
housing estates

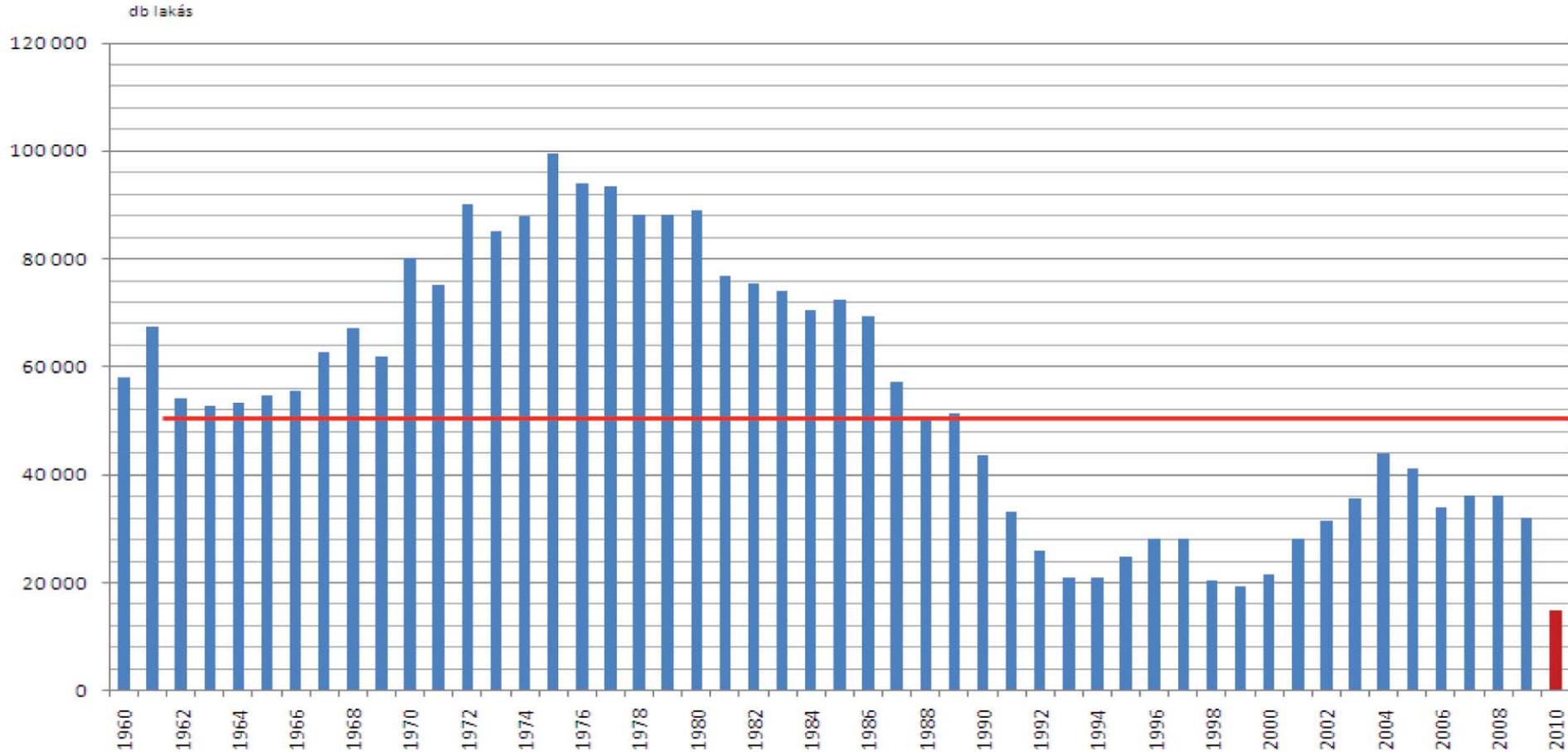
4 million flats

Consuming the 17% of the country's total energy production of 189 petajoule

Average energy cost per flat is 1000 EUR per year

# Newly built houses per year 1960–2010

red line represents the optimal amount that is enough for reproduction in a life cycle of 100 yrs

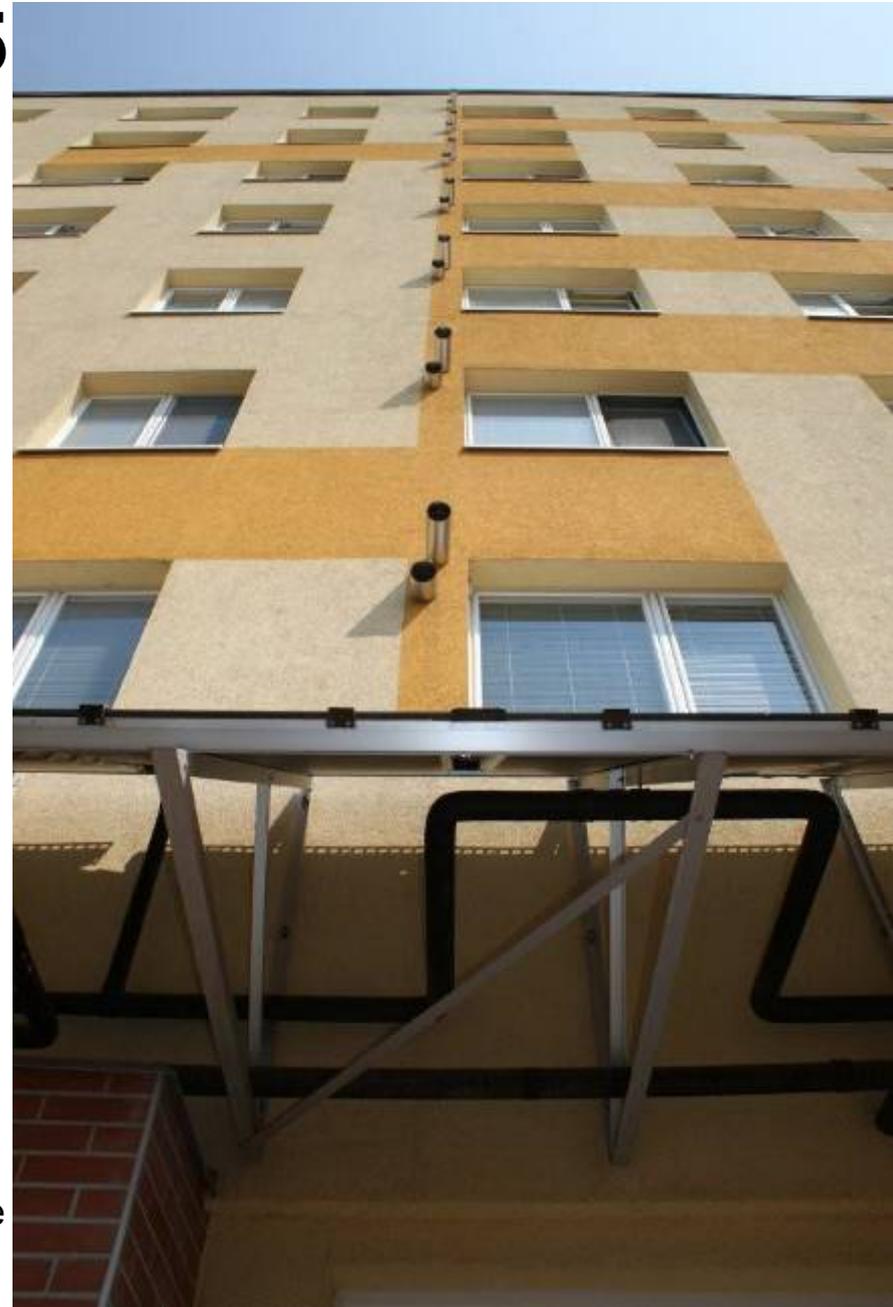


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# Best practices: Solanova – Dunaújváros 2005



nce





energy-efficiency project in social housing  
80 % reduction of heating energy  
50% reduction of energy used  
for warm water by solar panels  
16 cm insulation, triple glazing,  
ventilation with heat regain,  
green roof  
quasi-passive house  
~3,0 million HUF, 12000 EUR/flat

Ágnes Novák  
Miklós Osztrólczyk

## Further possibilities

- Water saving and recycling systems reducing water consumption with 50 %
- energy efficiency of electric equipments of users, a reduction potential of 50 %
- local small scale reed bed waste water systems reduce costs by 50 %
- green roofs and facades cool microclimate and improve green surfaces up to 90 % of total area





- Water saving toilets
- Dry pissoires
- Composting toilets



Cistern and composting box



# Passive houses

- first PHPP certificated family house, with a construction cost of ~ 1000 EUR/m<sup>2</sup>
- growing number of passive houses
- subsidies for energy efficiency and renewables up to 10% of total construction costs

# Biosolar-houses



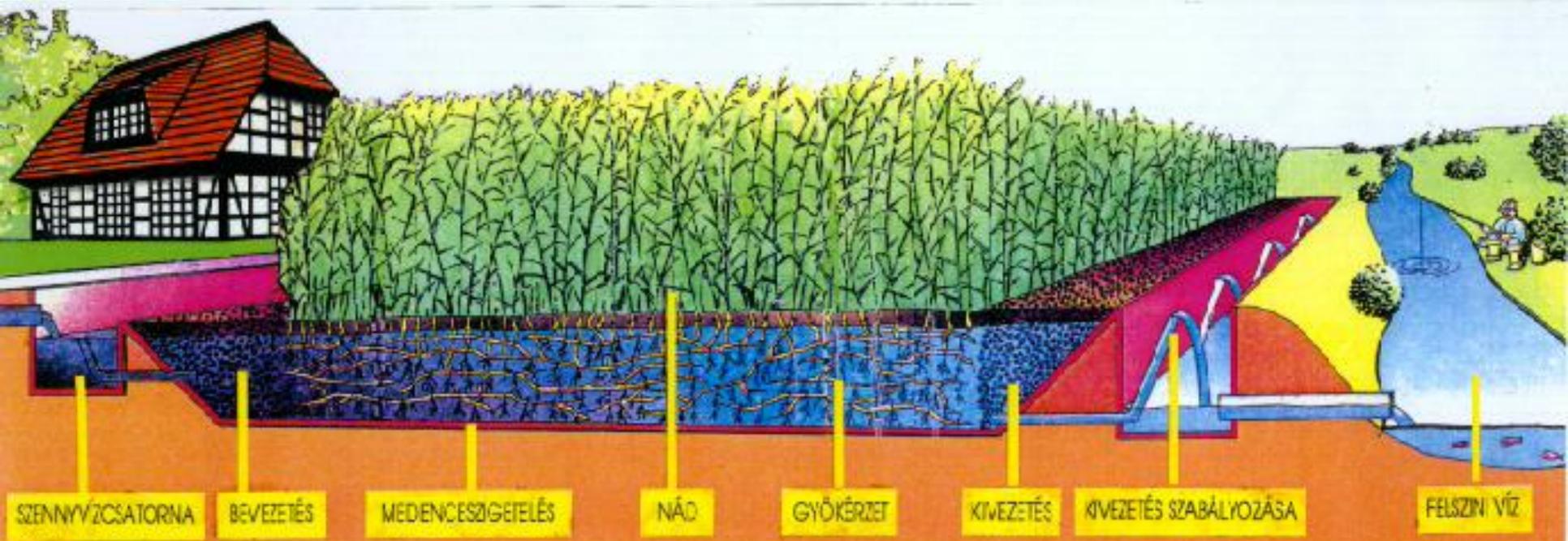
Biosolar house at Vácrátót,  
Built from recycled materials  
Greenroof  
Reed bed waste water system



Solar House of the Year 2007  
Sunspaces,  
solar heating support



**Small scale reed bed waste water systems with low investments and running costs – still, great centralised systems are favoured**



# A construction of a straw-bale house with earth brick inside walls, 2009



Laws like '3/2003 (I.25.) BM-GKM-KvVM joint decree',  
which practically “prohibit” the use of natural building materials  
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natural, non qualified building materials:  
straw, earth, recycled materials

# Priorities for social housing

- Public money can be given only for sustainable housing!
  - Energy efficient buildings: 90-100 % cost reduction
  - Water-efficient buildings: 50-100 % cost reduction
  - Pilot projects
  - Life Cycle Cost Analyses for economical sustainability
- Growing number of new flats for rent – social housing: 5000/year→15.000/year
- Accessable system: between private flats and social housing
- Constitution: the fundamental right for dwelling
- Community properties: housing cooperatives

# The importance of community property

- Public utilities in the ownership of the local community
  - Windparks, biosolar district heating systems, biofuel production from recycled vegetable oil
  - No profit is pulled out, income is returned to improve effectiveness
  - Private utilities favour big consumption – the community favours cost effectiveness, energy-efficiency
  - For a community owned utility development credits can be received easily
- Local energy community – Stadtwerk
  - the right to use locally produced energy: today in Hungary the maximum is a 50 kW system. Above that electricity must be sold to the grid for low price, and can be bought back for high price.
  - Self sufficient villages and cities

# Sustainable strategies for villages and towns

- Protection of land ownership in favour of local owners, restoration of community properties
- Sustainable land-use, agriculture and forestry
- Public utilities, water bases taken (back) into community ownership
- Steps towards autonomy of energy:
  - Energy-efficiency programmes
  - Local energy systems on renewables (heat, electricity, traffic)
- Water management:
  - Water-saving systems, rainwater-use, greywater-recycling
  - Local small scale waste water systems, reed beds, water re-use
  - Improving forest areas, wetlands, green architecture
- Food independence
  - Local markets for local products, Community Supported Agriculture

# Sustainable urban planning

- reducing traffic by mixed functions:
  - working and dwelling at the same place
  - refurbishing of big housing estates and sleeping quarters
- restoration of green belt around cities, producing food and fresh air
- sustainable buildings and districts
- social housing

# Sustainable architecture – a narrow path...



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