



HUNGARIAN  
INVESTMENT AND  
TRADE AGENCY

# The Hungarian Water and Sanitation Industry in the 21st century





Published by HITA

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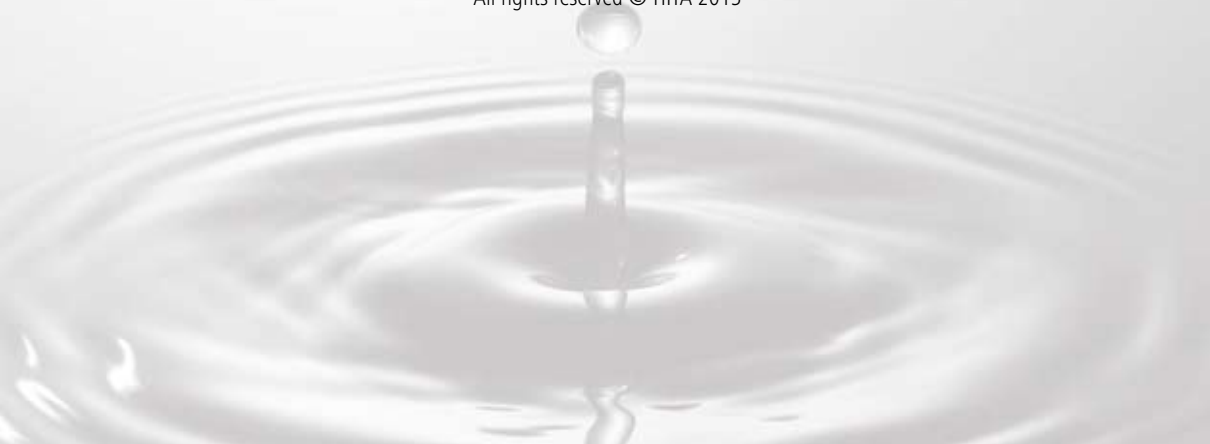
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Water is one of the most precious natural resources of our Planet. Only 2% of the world's water resources are made up by freshwater. However, this scarce resource plays a crucial role in all segments of nature, society and the economy. In view of the projected growth in the demand for water and accelerating climate change, it is expected that by 2030, some 40% of the world population will suffer from water shortages. Europe and Hungary will also be affected; access to water is likely to become a fundamental issue of prosperity and peace at individual and national level alike.

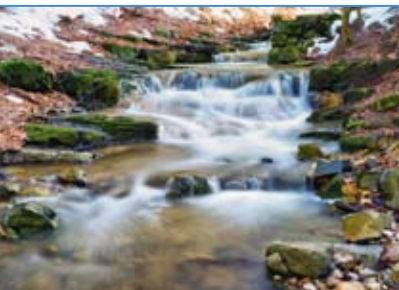
Hungary is well-known for its long tradition, extensive knowledge in water-related issues and for its highly developed water infrastructure. Water has always been an outstanding priority in Hungarian bilateral and multilateral foreign relations. In view of its traditional interests and expertise in the field, Hungary wishes to continue its strong engagement in shaping international water policy.

Building on Hungary's achievements during its Presidency of the EU in 2011, the Hungarian Government selected the issue of water as its top priority in the run up to and at the Rio+20 Conference on Sustainable Development in June 2012. The next step is the Budapest Water Summit, which will be held in October 2013 in Budapest. The objective of the Summit is to contribute to the elaboration of the water-related Sustainable Development Goals, providing concrete guidance on the most pressing water issues. These include drinking water, sanitation, waste water treatment, integrated water resources management, international water cooperation, innovative water technologies, green economy and financing, with a view to defining the priorities of global development policy post 2015.

As a result of its outstanding exposure to diverse hydrological challenges, Hungary has historically developed significant expertise in water management. To safeguard its water resources, the country has established a stringent legal regime and a solid institutional framework in water and sanitation management. Centuries of tradition in this area have been supported by a solid academic, educational and training background. Design and implementation of complex water engineering solutions for developing countries has always been and is a distinguished area of Hungary's international co-operation.

The Ministry of Foreign Affairs and the Hungarian Investment and Trade Agency, the body entrusted with stimulating Hungary's exports and fostering foreign direct investment, are glad to present this publication that provides a brief introduction into the Hungarian water management sector. We believe that Hungary can offer cutting edge technologies, competitive know-how and solutions in the field of water, a rich source of business opportunities and international co-operation.

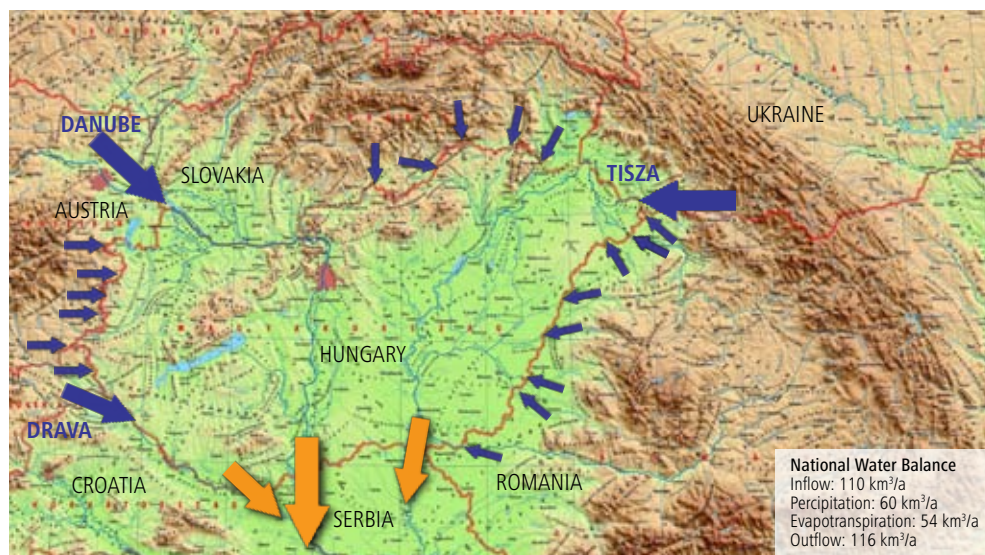
*Dr Gábor Baranyai  
Deputy State Secretary of the Ministry of Foreign Affairs  
Chair of the Organising Committee of the Budapest Water Summit*



## Hydro-geography of Hungary

Hungary is located in the Carpathian Basin, which forms a topographically discrete unit set in the European landscape surrounded by the semi-circular Carpathian Mountains.

Two thirds of the country is lowland (84% of the Hungarian territory is below the altitude of 200 m) with strong continental influence.



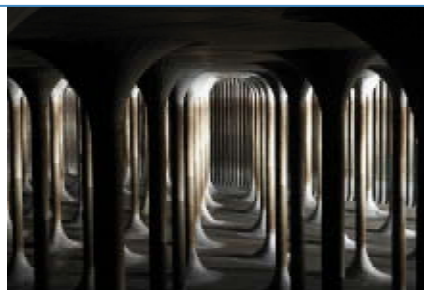
Source: *The Carpathian basin and Hungary's main hydrological features* (Somlyódy, 2002)

Hungary's entire territory is part of the river basin of the River Danube. Almost all rivers arrive from neighbouring countries, with 96% of the surface water resources being of foreign origin. Accumulating waters reach Hungary through 24 water courses and leave the country via three rivers, the Danube, the Tisza and the Drava. This is fundamental in determining Hungary's exposure to floods.

The ensuing scarcity and abundance of waters can equally cause problems. Under such specific water management circumstances close cooperation with

the neighbouring countries, as well as in the broader catchment area, is a fundamental political imperative for Hungary.

As a member of the European Union, Hungary is dedicated to implement the Water Framework Directive, the Flood Directive, the Natura 2000 Programme and all other water related legislation and policies. The active role in the implementation of the EU's Danube Region Strategy and the cooperation of the five Tisza Valley countries for finding solutions for flood problems, are outstanding examples of effective international water cooperation.



The length and watershed of rivers

River	Length		Watershed area	
	Total (km)	in Hungary (km)	Total (km <sup>2</sup> )	in Hungary (%)
Danube	2 860	417	817 000	5,7
Tisza	977	597	157 183	29,7
Dráva	695	143	40 076	10,4
Maros	754	50	30 332	6,2

Source: The Hungarian Central Statistical Office (HCSO)

#### United Nations - Friends of Water Group

The Steering Committee of the Friends of Water Group is composed of the Permanent Missions of Finland, Hungary, Tajikistan and Thailand at the United Nations in New York. The Group has been established as an informal platform to discuss water-related issues in support of the formal deliberations of the UN. The group has organized thematic discussions prior to the Rio+20 Conference, with the goal of bringing added value to the sustainable development discussions, through pragmatic and result-oriented approaches. Hungary, also as co-chair of the UNGA Open Working Group on Sustainable Development Goals (SDGs) remains a driver of the elaboration of a water-related SDG.

## Hungary: a power in water

### 🌊 A STRONG TRADITION

The region's abundant thermal water resources were already known to the Celts who inhabited today's Hungary over two thousand years ago. The Romans who settled in the area in the 1st century BC started to exploit the thermal springs naturally rising to the surface in the city of Aquincum, the provincial capital. During the 150 years of Ottoman rule in the 16th and 17th centuries, a large number of baths were built, some of which, in today's Budapest are still in use this day.

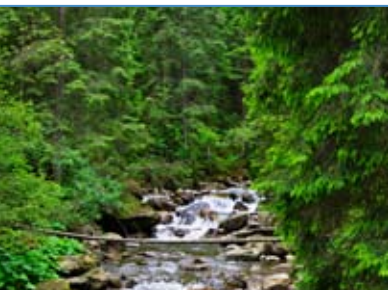
The first panel of the Royal Laws of Hungary with regard to water management had already appeared in the 12-13th century. The various state institutions and regulations designed to enforce common water-related goals have gradually evolved and expanded into an integrated system of water management over the past 200 years.

Regularisation of the two large rivers, the Danube and Tisza, as well as their tributaries, started more than 150 years ago. Similarly, a considerable wealth of experience has gathered in irrigation, inland navigation and water supply. The first water board, the Sárvíz Regulating Board, was created in 1810, with the Tisza Valley Water Board following in 1846.

#### Pál Vásárhelyi (1795-1846)



Pál Vásárhelyi elaborated, among others, the plans of the Iron Gate (Vaskapu) on the River Danube regulation and the River Tisza regulation. By 1846 he had prepared comprehensive regulation concept currently known as Vásárhelyi's Tisza Regulation Plan.



## EXTREME FLOODS: SUSTAINABLE CONTROL AND ADVANCED TOOLS

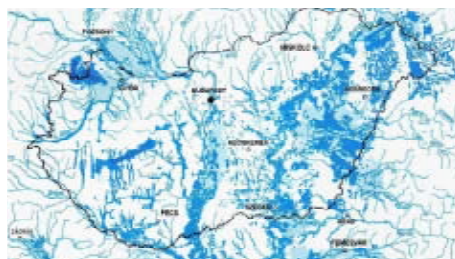
One quarter of the country is exposed to floods, which is exceptional in Europe. Flood dykes of 4200 km length protect 700 settlements, 2.5 million people, 2000 industrial plants and indirectly about 30% of the GDP.

## WATER RESOURCES

Hungary has a highly significant freshwater resource in international comparison. Groundwater is available throughout the country in sufficient quantity; it is the major source of drinking water supply.

The total water abstraction at present is about 6,000 million m<sup>3</sup>/year, 75% of which is for cooling water use. Within the remaining segment, the public is the major user with 40%, industry takes one quarter and agriculture uses the rest (irrigation 15%, an extremely low value, fishponds 5% and animal breeding 15%).

Alone in Budapest, over 68 million litres of water per day bubble into 118 springs and boreholes. The city of spas offers an astounding array of baths, from the sparkling Gellért Baths to the vast 1913 neo-baroque Széchenyi Spa to the Rudas Spa, a dramatic 16th-century Turkish pool with original Ottoman architecture.



The specific surface water resources amount to about 11,000 m<sup>3</sup>/cap/year, while the average surface water inflow amounts to yearly 112 km<sup>3</sup>. In contrast, Hungary's contribution to the outflow (600 m<sup>3</sup>/cap/year) is by far the smallest on the continent.

The available groundwater resources are estimated at about 2,410 million m<sup>3</sup>/year, from which porous aquifers makes up 1,910 million m<sup>3</sup>/year, while karst water is 500 million m<sup>3</sup>/year. In addition to these resources, rivers flowing in their gravel terraces can provide "bank filtered" water.

The geothermal water potential of the country also stands out: approximately 90 million m<sup>3</sup> of thermal water can be used annually, from which 44% is utilised for energy production or recreation. There are around 1,400 thermal water wells in the country.

## MAJOR FIGURES OF THE WATER MANAGEMENT

- Water consumption decreased by about 50% compared to the late 1980s. Today consumption remains stable with an average daily use per person of about 100-110 litres of water on a national level. While in Budapest the average daily consumption is 150-160 litres/person, in large cities it is 120-130 litres, in small villages it is as low as 50-70 litres.
- 75% of the homes are connected to sewage systems.
- According to expert opinion, no significant long term changes in the demand for drinking water can be expected compared to the current household consumption level of 400 million m<sup>3</sup>/year. Consumption for public and industrial purposes will also remain in the region of 170 million m<sup>3</sup>/year.
- Over 90% of the national water supply relies decisively on groundwater or riverbank filtered wells.



Water and sewerage figures (2011)	
Drinking water pipes length	62 000 km
Produced water	600 million m <sup>3</sup>
Drinking water sold in	500 million m <sup>3</sup>
Wastewater	450 million m <sup>3</sup>
Settlements with drinking water	3132
Homes with drinking water	3,8 million
Settlements with sewerage	1200
Homes with sewerage	2,4 million
Number of Wastewater Treatment Plants	500
Water and sewer services net sales	707 million EUR
Nr of employees of water management	20 000

Source: The Hungarian Water Utility Association

Sewerage and households (2000/2015)		
	2000	2015
Length of sewerage	20 000 km	35 000 km
Ratio of households connected	45%	85%

Source: The Hungarian Water Utility Association

#### József Gruber (1925-1972)



József Gruber is known as hydrodynamic researcher who achieved outstanding results in the hydrodynamic flow processes and machinery research. He was the rector of the Budapest University of Technology from 1961 to 1964. One of the largest reservoir in Budapest inside Gellért Hill is named after him.

## Water = drink, energy, recreation

### DRINKING WATER: A HUNGARIAN ASSET FOR THOUSANDS OF YEARS

Groundwater (water porous aquifers, karst water) in Hungary is available throughout the country in sufficient quantity; it constitutes the major source of drinking water supply. Every settlement in Hungary has public water works; some 98% of the population have access to drinking water supply, with approximately 94% of homes connected to the water pipeline network. The remaining part of the population is able to obtain water from utility services within a maximum of 150 metres from their home. The quality of the water supply in Hungary is adequate from public health view point;

even general opinion says that Hungarian tap water is "truly tasty". Long term demand for drinking water can be safely satisfied from available resources.

The quality of the water supplied by the waterworks in the major part of the country complies, in the chemical as well as in the physical aspects, with the strict EU regulations and standards. Until 2015 over 3.2 billion EUR will be invested to improve the quality of drinking water, mainly in the areas where the specific natural mineral content requires treatment.



Due to the prevailing hydrogeological conditions vast stocks of water in geologically and physically protected underground water sources contain dissolved mineral salts, elements, or gases (= mineral water) in Hungary. Currently there are 120 wells and springs that provide recognized natural mineral water, from which 45-50 are bottled and marketed. Mineral water bottling has now become one of the most dynamically developing sectors of the Hungarian food industry. Consumption of mineral water in the last 20 years has sharply increased, reaching at the end of

the last decade, 100 litres per person annually; this is growing by 5-10 litres per year. Export of mineral water has been steadily growing in the past years.

Leading Hungarian brands are



#### GREEN AND SUSTAINABLE ECONOMY: GEOTHERMAL WATER

Hungary's geothermal features are rather favourable. Drilling into relatively smaller depths is sufficient to reach temperatures that are higher by 1 degree than generally in the world. On about 80% of Hungary's territory, thermal water with temperatures over 30 degrees Celsius can be exploited.

It is estimated that there is over 455.000 PJ capacity of geothermal energy available. The geothermal installations in Hungary are estimated to have a total capacity of 694.2 MW. Installations are used in a variety of applications such as crop drying, green house heating and district heating.

#### WATER FOR RECREATION: HUNGARY IS A HEALING GARDEN

International tourist guides listed Hungary and its capital city Budapest as the number one destination for thermal water and wellness recreation. Thermal water is now recommended for a wide variety of health problems, from stress to joint pain, from gynaecological conditions to skin complaints. Throughout the country, the many thermal baths and high-quality spa facilities can accommodate 300,000 people at the same time.

Major and popular ecotourism destinations for holiday activities and water sports are: Lake Balaton, Lake Velencei, Lake Tisza, River Danube, River Tisza and Szigetköz, to name but a few.

Perhaps the jewel in the country's sparkling crown is Hévíz, a thermal lake of almost five hectares adorned with water lilies. The lake at the south-western corner of Lake Balaton is brimming with warm, alkaline and slightly radioactive water, rich in potassium salts, sulphur and hydrogen carbonate. The spring's powerful curative properties include relief for rheumatism, treatment for gynaecological complaints and stimulation of metabolism.





## Hungarians in the global water industry

### MASTER PLANS FOR WATER MANAGEMENT

- Between 1975 and 1990 experts of the former Water Resources Management Center (VIKÖZ, later VGI) together with Mongolian partners prepared the Water Management Master Plan of Mongolia and the regional master plans for the following basins: Mongolian Great Lakes, River Khovd, River Dzabhan, River Kherlen (Kerulen), Ongijn, Taats and Baidrag rivers. The Mongolian Parliament appraised this activity as "Project of the Century" even many years after the Hungarian experts finished

their projects. In connection with this excellent evaluation the Hungarian-Mongolian Water Management Cooperation Agreement was renewed in 2008.

- Hungarian experts executed master plans in Tanzania, Nigeria and Morocco, where they also managed reservoir construction. Experts have similarly served as high level advisors in Algeria and Kuwait.
- Hungarian specialists worked in African and Asian countries as FAO, WMO and WHO experts.

### WELL DRILLING

- Hungarian hydrologists and engineers had by 1980, assisted Mongolia in solving water problems on the steppe. Hungarian engineers and hydrologists trained and worked closely with Mongolian young professionals. By 1970, 225 new wells had been drilled to a depth of 100-200 metres. In connection with water prospecting, they executed geophysical exploration on 21,000 km<sup>2</sup>.
- Hungarian competitive technology and know-how in well drilling helped VIKUV to achieve business

success in the last decades in the African (Ethiopia) and the Central-Eastern European market.

#### Vilmos Zsigmondy (1821-1888)



In the second half of the 19th century, Vilmos Zsigmondy drilled a well in Budapest (City Park) that was the second largest well in Europe that time. The well, which was 970 metres deep and had a capacity of 2,200 litres per hour at 74 C°, was considered something of a sensation.

### IRRIGATION

#### Emil Mosonyi (1910-2009)



His name, as an engineer of hydraulics, is connected to dams and hydro power plants around the world. He was honorary professor at a number of universities and a member of various science academies. The University of Auckland in New Zealand established the Mosonyi prize to honour his work in the field of sustainable hydro power development.

- In the 1970s Hungarian experts provided help in Vietnam and in Mongolia, installing MA-200 type

irrigation equipment (in Mongolia all over the country about 150 pumping plants, in Vietnam in the Ba Vi irrigation system). They provided training for the local population and service for maintaining the installed irrigation capacities.

- In Morocco in the frame of international, technical and scientific cooperation, Hungarian experts were involved in the construction of the irrigation systems (River Moulouya and Rabat Region).
- From the 1980s Hungarian consultants (VIZITERV and MÉLYÉPTERV) took part in different irrigation projects in Algeria and Tunisia (irrigation of palm groves), in Yemen (Tihama and Taiz projects), in Sudan (Djebel Marra Project), in Iran (Gorgan Valley).



## Global challenges – Hungarian answers and excellence

### 🌊 CLIMATE CHANGE

According to recent studies the climate of Hungary will likely shift to a more Mediterranean one, with more frequent extreme events. From a long term perspective, the likely impact of climate change will be primarily in the Tisza Valley, which already faces water shortage problems.

#### New Vásárhelyi Plan

Planning of necessary interventions of flood protection development and operations of flood reservoirs has to be made in harmony with the conservation and development of ecological systems. The development of Tisza Valley flood protection system serves as protection of people and assets against flood; it is integrated into the ecological system of Tisza, its tributaries and their flood plains. Besides this, the New Vásárhelyi Plan will ensure new opportunities for rural development in the Tisza Plain.

### 🌊 EXTREME FLOODS

Flood protection has been successful in the past, but recently both the Danube and the Tisza Basin have exhibited new signs of increasing risks: flood peak levels show a clearly increasing trend.

#### Flood fighting in 2006

In spring 2006, extreme flooding occurred on Hungary's largest rivers, the Danube and the Tisza. For the Danube, this extended from the border to Budapest, while along the entire length of the Tisza, the water level exceeded the highest levels observed previously.

Organizations responsible for flood protection were on standby from the beginning of March to the end of May, covering dykes of 3,100 km, from which 1,800 km were categorized at the 3rd highest level of protection. In order to prevent flooding and the breaching of dams, nearly 12 million sandbags were needed for protection. During peak hours more than 14 thousand people worked on the dams and embankments. On 21st of April, on the right bank of the River Körös a 90 meter long crack appeared threatening the dam with collapse. Due to the threat, three villages were evacuated as a precaution; the rescue service took charge of relocation and care. Thanks to heroic work and flood protection expertise, the dam was reinforced and a major catastrophe was avoided.

#### Flood fighting in 2013

Flooding on the River Danube in all relevant countries, including Hungary beginning of June 2013 has surpassed water levels never measured in the last century. Level of Danube's water exceeded by 300 mm the record levels but the river remained shy of the 9.3 meter height of flood walls protecting downtown of Budapest. Flood protection professionals were able to hold water in beds of the 418 km length in Hungary. However flood caused significant harms in wealth of people and public in large territory of the country, thanks to joint efforts of rescue service and operation of the warning system together with thousands of volunteers, human life was not in direct danger and all settlements avoided enormous damages.



## EXTREME DROUGHTS

It is not yet clear whether we are facing a trend influenced by climate change, or recent extreme events still remain within the range of natural climate variability. Whatever the cause, water management will need to deal with the problem. In Hungary, droughts present a major challenge and climate change is expected to make the situation worse. In recent decades the financial loss due to droughts has dramatically increased; in 2012 it reached HUF 400 billion (EUR 1.4 billion). As a response a comprehensive water management strategy has been under development since spring 2013, including a drought management policy and irrigation development.

### VIKUV



Due to the geographical conditions of the country, an intensive 'deep water mining' industry developed in the early 19th century. This tradition carries on today with high standards, unique technologies and capabilities. VIKUV spent USD 100 thousand on drilling two wells in the villages of Abuware and Hابلomender (Ethiopia). They built two waterworks and one sub irrigation system on a 3 hectare site nearby. The irrigation system allows the local community to harvest three times a year and to have farm products throughout the year. The waterworks provides 6000 inhabitants of the Kobo valley with fresh water every day. The project started in September 2007 with the training of Ethiopian engineers. Involving paid local labour in the drilling, the wells were installed by the end of September 2008 and the waterworks by June 2009.

## STORM WATER MANAGEMENT

Storm water is rainwater and melted snow that runs off the catchment, be it rural or urban. Due to the geographical characteristics of the Carpathian Basin, Hungary has always been affected by extensive flooding and excess water inundation. Runoff control in hilly areas is especially important in the upstream part of rural catchments. This was the reason of launching a reservoir programme for hilly regions, in the framework of which surface runoff, generated by heavy rainfall and characterized by short duration, is stored in reservoirs created with due regard to environmental considerations.

### Pureco



The company was contracted at the Arad A1 motorway expansion in 2012 and also the Satu Mare bypass in Romania. The company has proposed their own patented proven solution for the treatment of the rainwater collected from whole length of the approximately 213 km motorway; the volume totals 35,500 l/s. The ENVIA TRP® drift and light liquid separator is installable in open-surface storm water drainage channels, the sizes vary between 60 and 225 l/s nominal flow. These installations are known for their low cost and short installation time, as well as simple and economical operation.



## URBAN ENVIRONMENT

To meet requirements of the Urban Wastewater Directive of the European Union, a National Sewerage and Wastewater Treatment Programme was established, which incorporated a detailed implementation timetable till 2015. The plan is to solve wastewater management with tertiary treatment in settlements greater than 10,000 population equivalent (PE) situated in so-called sensitive areas and to have at least biological treatment in all existing treatment plants.

General Electric (former Zenon)  
(Oroszlány, Hungary)



GE Water operates a manufacturing centre of excellence in Oroszlány, which is the World's largest ultrafiltration membrane module manufacturing site. In the last decade, the facility has increased its production capacity tenfold, with its growth underscoring the urgent need for municipalities and industrial users to treat and reuse water, both to conserve freshwater supplies and to lessen the impact of wastewater discharges. GE's Oroszlány facility covers 80,000 m<sup>2</sup>, has 870 employees and can produce 250 "ZeeWeed" MBR systems annually. GE's industry-leading water treatment technology MBR, a fast-growing alternative to conventional water-treatment methods, uses hollow-fibre UF membranes to separate particles, bacteria and viruses from wastewater, along with beneficial bacteria to further treat the water, providing a more consistent and better quality.

## WATER QUALITY AND ACCIDENTAL POLLUTIONS

A new Hungarian groundwater and soil protection regime was adopted in 2000 to ensure compliance with the relevant EU-directive on groundwater protection. In view of the fact over 90% of drinking water is abstracted from groundwater, the Hungarian legislation is considered as one of the most stringent in the World.

Organica



In Shenzhen, China, the lack of wastewater infrastructure was an obstacle for further development of a major industrial zone where land was a premium, thus a traditional waste water treatment plan was out of the question. Due to its small footprint Organica could offer a solution to locally treat the wastewater close to the source. The unique aesthetics and completely odourless operation enabled the seamless integration of the waste water treatment plan directly adjacent to the buildings it serves. The plant in Shenzhen is Organica's excellent reference of a four-train FBR system combining the advantages of conventional Sequence Batch Reactors (SBR) and continuous flow wastewater treatment technologies. The FBR process uses a combination of continuous flow and sequencing batch reactor systems, which combined with the natural biofilm carrier of plant roots, provides outstanding efficiency.

*"Not only is Organica's plant flexible enough to fit into a highly dense urban environment, it also provides cutting-edge technologies for quality water treatment. Their approach to Nitrogen removal is superior to any existing technological solution."*

*Mr Wen, Shenzhen Environmental Engineering and Science Center*



## International cooperation

### 🌊 DANUBE REGIONAL STRATEGY

The EU Strategy for the Danube Region was prepared by the EU Commission and endorsed by the Council under the Hungarian Presidency in 2011. The main objectives of the complex strategy include socio-economic development, the improvement of competitiveness, environmental management and resource efficiency, enhancement of security and the modernisation of transport corridors. The strategy has four pillars:

- Connecting the Danube Region
- Protecting the Environment in the Danube Region
- Building Prosperity in the Danube Region
- Strengthening the Danube Region

Hungary is the lead partner for two important, water related topics of the Danube Strategy: Restore and maintain the quality of waters, Manage environmental risks.

### 🌊 TRANSBOUNDARY COOPERATION

Efficient international collaboration in the Danube and Carpathian Basins is a key element of water resource management. Hungary has bilateral water cooperation agreements with all its neighbouring countries: Austria, Slovakia, Ukraine, Romania, Serbia, Croatia and Slovenia. The main issues of these agreements are

- Prevention, mitigation and monitoring of the effects of drought
- Prevent, limit and control the harmful transboundary effects (of floods, drought, accidental pollution)
- Development of systems monitoring and analysing the dissemination of pollutants across borders
- Sustainable utilisation of water resources
- Encouraging common research and technology development activities

### 🌊 BILATERAL GOVERNMENTAL AGREEMENTS AND COLLABORATION

- Hungarian-Dutch Water Committee
- Hungarian-Bavarian water cooperation
- Hungarian-Chinese water cooperation
- Hungarian-Czech water cooperation
- Hungarian-French water cooperation
- Hungarian-Spanish water cooperation
- Hungarian-Mongolian water cooperation

### 🌊 MULTILATERAL AGREEMENTS

Hungary is also an active member of the International Commission for the Protection of the River Danube (ICPDR), a party to and dedicated promoter of a number of international agreements such as the 1992 Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes and its various protocols.



## Capacity building + R&D

### INTERNATIONAL COOPERATION IN HIGHER EDUCATION AND CAPACITY BUILDING PROGRAMMES

- The Budapest University of Technology and Economics managed in 2004-2011, a training programme called “Hydroinformatics and Water Management” in cooperation with four European university partners. Altogether 200 foreign students from 30 countries graduated in this unique international education project.
- The former research institute VITUKI ran between 1966 and 2004 an outstanding postgraduate training programme, partly financed and supported by UNESCO, in hydrology engineering. During the course of the programme, annually 20 engineers from 80 developing and transitional countries studied in Budapest. Thanks to the long term influence of the programme, Hungarian know-how in water management is greatly recognised around the world.
- Eötvös József College in Baja has commenced educational and research collaboration in hydrology engineering education with Subotica and Osijek (Serbia).
- Highly recognised Hungarian scientists active in the global water management research field include András Bárdossy, János Bogárdi, Sándor Csallán, László Hayde, László Iritz, Gábor Karády, Péter Litheráthy, László Somlyódy, Gábor Várady.

### WATER MANAGEMENT AND HYDROLOGY RELATED RESEARCH INSTITUTES

- Institute of the Hungarian Academy of Sciences (MTA, [www.mta.hu](http://www.mta.hu)) Centre for Ecological Research ([www.okologia.mta.hu](http://www.okologia.mta.hu)) / sub organisations: Balaton Limnological Institute ([www.blki.hu](http://www.blki.hu)) and the Danube Research Institute ([www.mta-dki.hu](http://www.mta-dki.hu)); Research Centre of Astronomy and Earth Sciences ([www.csfk.mta.hu](http://www.csfk.mta.hu)) / sub organisation: Institute for Geological and Geochemical Research ([www.geochem.hu](http://www.geochem.hu))
- Bay Zoltán Nonprofit Ltd for Applied Research ([www.bayzoltan.hu](http://www.bayzoltan.hu)) Biotechnology Institute of Szeged ([www.bayzoltan.hu/bay-bio](http://www.bayzoltan.hu/bay-bio))
- Geological and Geophysical Institute of Hungary (MFGI, [www.mfgi.hu](http://www.mfgi.hu))
- Budapest University of Technology and Economics (BME, [www.bme.hu](http://www.bme.hu)) Faculty of Civil Engineering ([www.epito.bme.hu](http://www.epito.bme.hu)), Faculty of Mechanical Engineering ([www.gpk.bme.hu](http://www.gpk.bme.hu))
- Research Institute for Fisheries, Aquaculture and Irrigation (Szarvas) ([www.haki.hu](http://www.haki.hu))

#### András Szöllösi-Nagy (1949-)



His principle research field is hydrological forecasting. In 1976, he worked with IBM Italy on the Arno River Forecasting System. He joined UNESCO in Paris in 1989 as Director of the Division of Water Sciences and Secretary of the International Hydrological Programme. Since 2009 he is Rector of the UNESCO-IHE Institute for Water Education in Delft (the Netherlands).



#### Education institutes

Institute	Courses
Budapest University of Technology and Economics ( <a href="http://www.bme.hu">www.bme.hu</a> )	civil engineering, hydraulic engineering, water management (BSc + MSc + PhD)
Eötvös Lóránd University (ELTE) ( <a href="http://www.elte.hu">www.elte.hu</a> )	Meteorology, hydrology, hydrogeology (BSc + MSc + PhD)
Szent István University ( <a href="http://www.szie.hu">www.szie.hu</a> )	civil engineering, infrastructure management, environmental management, agricultural engineering (BSc + MSc + PhD)
University of Miskolc ( <a href="http://www.uni-miskolc.hu">www.uni-miskolc.hu</a> )	geology engineering, environmental engineering, hydrogeology engineering (BSc + MSc)
University of Debrecen ( <a href="http://www.unideb.hu">www.unideb.hu</a> )	civil engineering, environmental engineering, agricultural engineering (BSc + MSc + PhD)
University of Pécs ( <a href="http://www.pte.hu">www.pte.hu</a> )	hydraulic engineering (BSc)
Széchenyi István University ( <a href="http://uni.sze.hu">http://uni.sze.hu</a> )	civil engineering (BSc + MSc)
Eötvös József College ( <a href="http://www.ejf.hu">www.ejf.hu</a> )	civil engineering, water management (BSc)

## Major Partners and Supporters

### Hungarian Water Cluster



The founding objective of the Hungarian Water ([www.watercluster.hu](http://www.watercluster.hu) established in 2008) is to bring together Hungarian companies operating in the different areas of the water industry, to harmonize specific development and innovation activities, production development and to create consortiums for investment projects and tenders. There is a strong cooperation among the member companies in foreign markets to jointly help their potential partners in water management issues by using their expertise, knowledge, know-how and capacity.

The Cluster possesses a broad knowledge base that includes

- public utility (water and drainage systems), drinking water purification / services / water packaging / water treatment,
- communal and industrial wastewater treatment / purification,
- planning / construction relating to flood prevention.



### Hungarian Water Utility Association

The members of the Hungarian Water Utility Association ([www.maviz.org](http://www.maviz.org), "MaVíz" established in 1990) comprise water and sewage companies acting in Hungary. Educational institutes, commercial and technology oriented water industry companies have also joined as associated members. As an independent interlocutor MaVíz harmonizes and represents the interests of the sector as well as offers trade development and engineering services. MaVíz maintains relations with national and foreign organizations, central and local governments,

scientific and public stakeholders. MaVíz also advances the spread of a new technologies and new methods of water management and supports innovation of the industry.



The Hungarian Water Utility Association is a member of EUREAU (European Federation of National Associations of Water and Wastewater Services) and IWA (International Water Association).

### National Union of Water Management Associations ([www.tir.hu](http://www.tir.hu))

The Hungarian union of water boards (National Union of Water Management Associations) was established in 1992. Since 1998 the Hungarian water boards act under the umbrella of the Ministry of Rural Development. The number of members is 82; the average size is close to 100,000 hectares.

### Hungarian Wastewater Association ([www.maszesz.hu](http://www.maszesz.hu))

The Hungarian Wastewater Association provides a forum for planners, engineers, experts and government officials, who together enable the development of the Hungarian sewerage and waste water treatment infrastructure and systems.



### Hungarian Chamber of Engineers ([www.mmk.hu](http://www.mmk.hu))



The Hungarian Chamber of Engineers is the self-governing body of engineers in the field of planning and technical expertise, conducting and certifying the qualifications of professional engineers. The Chamber has 20 professional sections covering all fields of engineering activities, inclusive geology, water management and civil engineering.

### Association of Environmental Enterprises ([www.kszgysz.hu](http://www.kszgysz.hu))

The Association of Environmental Enterprises, established in 1992, covers the whole spectrum of the environmental sector including water management.



### Hungarian Hydrological Society ([www.hidrologia.hu](http://www.hidrologia.hu))

The Hungarian Hydrological Society is a non-profit organisation with 2,200 individual members and 250 members organisations from water administration, public services, water industry, research institutes, consulting companies and universities.



### GWP Hungary Foundation ([www.gwpmo.hu](http://www.gwpmo.hu))

The GWP Hungary Foundation (the Hungarian partner of the Global Water Partnership) supports the sustainable development and management of water resources. GWP Hungary believes that an integrated approach managing water resources is the most effective way to contribute to GWP's vision - a water secure world. The Foundation cooperates with the key water stakeholders of the country and supports: public involvement, training, public awareness raising, implementing EU regulation related to water and transboundary cooperation in the Danube Basin.







## Major companies of the Hungarian water sector

Hungarian companies		
Company	Sub sector	Website
Agriapipe	Construction	<a href="http://www.agriapipe.hu">www.agriapipe.hu</a>
Agroinvest	Engineering	<a href="http://www.agroinvest.hu">www.agroinvest.hu</a>
Alföldvíz	Utility service	<a href="http://www.bekesvizmu.hu">www.bekesvizmu.hu</a>
Aquaprofit	Consulting	<a href="http://www.aquaprofit.hu">www.aquaprofit.hu</a>
BDL	Consulting	<a href="http://www.bdl.hu">www.bdl.hu</a>
Bonex	Construction	<a href="http://www.bonex.hu">www.bonex.hu</a>
Clarity Consulting	Consulting	<a href="http://www.clarity.hu">www.clarity.hu</a>
Cordi K+F Nonprofit	Research	<a href="http://www.cordi.hu">www.cordi.hu</a>
Duna Menti Regionális Vízmű	Utility service	<a href="http://www.dmrvt.hu">www.dmrvt.hu</a>
Dunántúli Regionális Vízmű	Utility service	<a href="http://www.drvt.hu">www.drvt.hu</a>
Elcom	Engineering	<a href="http://www.elcom.hu">www.elcom.hu</a>
Északdunántúli Vízmű	Utility service	<a href="http://www.edvrt.hu">www.edvrt.hu</a>
Fejérvíz	Utility service	<a href="http://www.fejeviz.hu">www.fejeviz.hu</a>
Fővárosi Csatornázási Művek	Utility service	<a href="http://www.fcsm.hu">www.fcsm.hu</a>
Fővárosi Vízművek	Utility service	<a href="http://www.vizmuvek.hu">www.vizmuvek.hu</a>
Gradex	Engineering	<a href="http://www.gradex.hu">www.gradex.hu</a>
Hidrofilt	Engineering	<a href="http://www.hidrofilt.hu">www.hidrofilt.hu</a>
Hidrokomplex	Consulting	<a href="http://www.hidrokomplex.hu">www.hidrokomplex.hu</a>
Keviep Hungary	Construction	<a href="http://www.keviep.hu">www.keviep.hu</a>



### Hungarian companies

Company	Sub sector	Website
Nyírségvíz	Utility service	<a href="http://www.nyirsegviz.hu">www.nyirsegviz.hu</a>
Organica	Engineering	<a href="http://www.organicawater.com">www.organicawater.com</a>
Pannon-Víz	Utility service	<a href="http://www.pannon-viz.hu">www.pannon-viz.hu</a>
Pureco	Engineering	<a href="http://www.pureco.hu">www.pureco.hu</a>
Tradeland	Consulting	<a href="http://www.tradeland.hu">www.tradeland.hu</a>
Vasivíz	Utility service	<a href="http://www.vasiviz">www.vasiviz</a>
VIKUV	Construction	<a href="http://www.vikuv.hu">www.vikuv.hu</a>
VTK Innosystem	Consulting	<a href="http://www.innosystem.hu">www.innosystem.hu</a>

### Foreign companies

Company	Sub sector	Website
Atlas Copco	Engineering	<a href="http://www.atlascopco.hu">www.atlascopco.hu</a>
Danfoss	Supplying	<a href="http://www.danfoss.com/hungary">www.danfoss.com/hungary</a>
DHI	Consulting	<a href="http://www.dhi.hu">www.dhi.hu</a>
Ganz Engineering	Engineering	<a href="http://www.ganz-eem.com">www.ganz-eem.com</a>
General Electric	Supplying	<a href="http://www.ge.hu">www.ge.hu</a>
Grundfos	Supplying	<a href="http://www.grundfos.hu">www.grundfos.hu</a>
Hobas	Supplying	<a href="http://www.hobas.com">www.hobas.com</a>
Siemens	Engineering	<a href="http://www.siemens.com">www.siemens.com</a>
SUEZ Environnement	Utility service	<a href="http://www.suez-env.hu">www.suez-env.hu</a>
Veolia	Utility service	<a href="http://www.vws.hu">www.vws.hu</a>
Wilo	Engineering	<a href="http://www.wilo.hu">www.wilo.hu</a>



## HUNGARIAN INVESTMENT AND TRADE AGENCY



### Hungarian Investment and Trade Agency



#### HUNGARIAN INVESTMENT AND TRADE AGENCY

The Hungarian Investment and Trade Agency (HITA) was established by the Hungarian Government to promote the international business activities of Hungarian small and medium-sized enterprises and to encourage foreign businesses to invest in Hungary. The Agency is supervised by the Prime Minister's Office.

One of the key priorities of the government programme is strengthening the presence of small and medium-sized enterprises on international markets. The Agency organises company surveys and company visits aimed at assessing exportable goods, innovative technologies and services, as well as establishing personal relationships and providing business development advice.

The Agency aims to enhance investor confidence and promote investments primarily in economically disadvantaged areas. Through its extensive network of contacts in both the public and private sectors, HITA provides foreign investors with high-quality support for key decision-making processes and a wealth of supplementary services: project preparation, implementation, aftercare.

The Agency, in addition to its central office in Budapest, maintains a network of six regional branch offices and an international foreign trade professional diplomatic service, which - with their local knowledge and network of contacts - support HITA's investment and export promotion activities.

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