

OPEN EYES ECONOMY

# ON TOUR



**open '18**  
**eyes**  
economy  
summit

The International Congress  
of the Economy of Values  
**ICE Krakow 20-21 XI 2018**

**CITY-IDEA:**  
**Polish-Dutch Partnership**  
**Building, on innovative**  
**water solutions**

**June 13, 2018, 9.00 AM**  
Zoetermeer, The Netherlands

MAIN PARTNERS OF OEE ON TOUR 2018



ORGANIZERS



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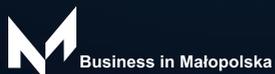


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POWERED BY



prof. Jerzy Hausner

UNIVERSITY OF ECONOMICS IN KRAKÓW

## Foreword

### DEAR PARTICIPANTS,

Since 2016 we meet in November in Kraków at the Open Eyes Economy Summit discussing the matters of common values and the ability to create them in order to change the world for better. We focus on many issues concerning Firm-Idea, University-Idea or City-Idea. But we do not want this to be only a once a year event, that is why we organize a series of seminars and conferences called “OEEs on Tour”.

This year in May for the first time we managed to be present outside Poland, in Amsterdam. Only a few weeks later we are with our project in The Netherlands again. It is an immense pleasure to be here in Zoetermeer and focus on Polish-Dutch Partnership Building on innovative water solutions. Together we will discuss specific cases outlining challenges and common problems, workshop participants will have a chance to reflect on their own solutions to these problems and mirror them with others looking for most innovative and efficient approaches.

The “OEEs on Tour” cycle is a part of a joint intellectual journey and we are happy to share this journey together with you.

I would like to thank our partners from the Netherland Water Partnership, Envaqua and The Embassy of the Kingdom of the Netherlands

in Poland for all their support, commitment and willingness to cooperate on this event.

I hope the debates will be fruitful and we shall meet again. The first occasion will occur on 24–25 of September in Wrocław where another conference within the “OEEs on Tour” cycle will be held. It will undertake the “Economy of a Water City” issues. But most of all I hope to see you again in Kraków on 20–21 of November at the Open Eyes Economy Summit 3.

*Professor Jerzy Hausner*

The Chairman of the  
Open Eyes Economy Summit  
Program Council

**Paweł Chudziński**

AQUANET SA

## **Management of sludge from wastewater treatment plants as a social problem**

Waste is a global problem therefore proper waste segregation should begin with households. We strive to re-use all wastes in order to create a closed-loop system. The situation is similar as regards waste from wastewater plants, including sludge. Sludge management is a serious problem for every wastewater treatment plant. Significant outlays are required to solve that problem.

Sludge has a great energy and fertilizer potential. Which direction should be followed? Using its energy or fertilizer potential? What about thermal hydrolysis? Or co-digestion and, consequently, organic recycling? Should the problem be considered locally or on a larger scale? Many questions and considerations regarding that issue have always been and will continue to be posed.

The best solution would be to follow a direction that enables the use of all sludge in a closed-loop system. If we rely on combustion, then the ashes should also be used; in case of drying, the dried matter should be further processed; while composting, the quality of the com-

post should be stable. However, all solutions and relating investments outlays are very costly, both at the investment and operational stage.

Aquanet S.A. generates approximately 78,000 tons of sludge yearly, and the current cost of its management (drying and composting) amounts to approximately PLN 19 million.

Data for 2017: composting – PLN 136 /ton of dehydrated sludge (price in 2018 – PLN 176 / ton); 67,000 tons were composted, which resulted in the total cost of sludge management amounting to PLN 9.1 million. Compared with the company's total revenues of approximately PLN 450 million, the cost of wastewater collection and disposal amounts to approximately PLN 200 million.

Aquanet S.A. has also analysed the average cost of sludge combustion, using the standard technology. It would amount to approximately PLN 290 per ton of dehydrated sludge. As regards our Company, if we combusted all sludge we generate, the total annual cost of sludge management would amount to approximately PLN 22.6 million. Adoption of such a solution would result in a 5% increase of the tariffs exclusively due to that factor. In view of the low-price availability of sewerage services, tariff increase is limited due to social conditions.

When comparing the unit cost of different types of sludge management, composting is the cheapest option, followed by mono-combustion of wet sludge.

The agricultural use (composting), however, involves additional risks due to:

1. provisions regulating sludge management (sludge collection not possible, transport of wet sludge exclusively within the province where it was generated etc.)
2. environmental risk – the generator is responsible for sludge until its final processing; and if it is not processed, for its disposal – this results in the need to control subcontractors at further stages of the process
3. significant odour nuisance

Putting the business aspects aside, thermal processing of sludge (both drying and combustion) has a negative impact on the natural environment (dusts, combustion products, including production of CO<sub>2</sub> and gases which need to be further neutralized etc.).

The key challenge of sludge management, that has a significant impact on the unit price of the process, is the obtained degree of dehydration of digested sludge. The higher the dehydration degree, the lower the unit cost (at the moment, Aquanet obtains up to 23.5% of dry mass).

Bearing in mind the aforementioned disadvantages of both presented processes, it is necessary to search for new technologies, free of such drawbacks.

**Zbigniew Kundzewicz**

POLISH ACADEMY OF SCIENCE.

## **Social value of water in the blue-green city of Wrocław (Poland)**

The blue-green city of Wrocław can serve as a case study of relevance to the topical area of social value of water. Many activities towards awareness raising have been undertaken in the city. While initiated and enhanced by municipal authorities, utilities, and groups of citizens, such activities have been supported by many inhabitants. General awareness of water problems (too much, too little, too dirty) has been improved and so has been the understanding of possible solutions.

Wrocław is located in the valley of the River Odra and its numerous tributaries and this determines the rich biodiversity and the presence of ecological corridors. The green-blue skeleton of the city consists of green areas forming a system of bands based on river valleys (blue areas).

In the city, many activities have been undertaken aimed at raising awareness of the necessity of rational water use. Water consumption is metered (over 99% of users have water meters). In 2005–2017, water consumption in Wrocław decreased by 35%. In the last seven years, water losses have decreased by around 30%, in result of the modernization of the network and advances in monitoring.

Since December 2015, the Environmental Education Center „Hydropolis“ has been operating in Wrocław, addressed to the general audience in all age groups. The Center plays a major role in education and raising of awareness about water. As a center of knowledge about water, Hydropolis is the only such facility in Poland and one of a few worldwide. As a part of the permanent exhibition, Hydropolis offers a large-scale model with an interactive visualisation of the water level during the destructive flooding of July 1997.

The city supports collecting water in private and public areas through: creation of green roofs, recovery of impervious surfaces for retention water (e.g. rain lawns recovered from excess surface of roads and pavements, planting trees), creating ponds, collecting rainwater and using it in the dry period. The city develops and reconstructs a network of canals, drainage ditches and periodically flooded areas receiving rainwater from the city's surface. Examples of existing retention of rainwater: the Park Południe Reservoir, which also has a recreation function and a dry reservoir with a volume of 3000 m<sup>3</sup> on the Grabiszynka Stream. Gray water is used at the Municipal Stadium.

A sample of issues for consideration at the session:

1. Facets of social value of water (nature, health, production, recreation, aesthetics, tradition, culture, religion)
2. Water resources for sustainable development
3. Goal of the EU Water Framework Directive – crucial for the social value of water
4. Water for quality of life – sustainable development indicators
5. Environmental, social, and economic pillars of the notion of sustainable development
6. Utilities do not only provide drinking water and treat wastewater, but also contribute to environmental awareness raising

## The new conditions for development of water supply system – case of Krakow

### The need to conduct risk assessment for the water supply system

From the beginning of 2018 as a result of launching new Minister of Health's regulation, which fully implements Council Directive 98/83/WE of 3 November 1998 on the quality of water intended for human consumption and Council Directive 1787/2015 (which changes attachments II and III in Council Directive 98/83/WE), in Poland implementing risk assessment based on WHO Water Safety Plans, is optional. However, it is necessary condition to use flexible monitoring system (increasing/decreasing range and/or frequency of the research). Regardless it, the new Water Law from 20th July 2017 since 1st January 2018 in Chapter 6 titled "Protection of water intakes and inland water reservoirs" implements obligation of establishing direct protection zones of water intakes and necessity to make an assessment risk in case designating these zones (article 133). The project of the new Drinking Water Directive concerning quality of water intended for human

consumption assumes obligation of the risk assessment for the whole system of water supply (from the protection zones to recipient's tap).

### Questions/issues

1. What are the legal regulations regarding the risk assessment in the water supply system in other EU countries (mandatory/ optional)?
2. Are there solutions in other EU countries of risk assessment (risk management) obligatory only for water intakes, not for the whole water supply chain (water treatment, distribution, customer service)?
3. What is the main motivation of particular water companies in EU countries when introducing risk management (water safety plan) if it is optional? What is the main goal – money saving as a result of launching flexible monitoring system and decreasing frequency of research or the real threats rating (especially the new ones) even if it is connected with additional costs?

### Increased quality requirements for the water intended for consumption

The change in EU regulations – project of the new EU Directive concerning quality of water intended for human consumption assumes increasing the scope (new chemical and microbiological parameters for monitoring, exacerbating some acceptable standards) and substantial increasing frequency of the research in laboratory – yet basic analysis have been made twice weekly and extended once a month or once per quarter (it depends on the type of parameter analyzed).

The preliminary estimates show that analysis of the results of implementing the new EU Directive contains underestimated costs. The load connected with danger and risk assessment and measurement of new parameters will be considerable. Many notations of the Directive

show that the whole costs connected with supplying water to marginalized groups and creating information systems for consumers will be incurred by the suppliers. It must increase the tariff.

Taking it into consideration the increase of the frequency of sampling and expanding its research to all the parameters mentioned in the attachment I we get about tenfold increase of costs, comparing it to the present control and review monitoring. It is data based on the general estimates, because actual laboratories are not able to estimate costs connected with new parameters research.

The new approach to ensuring water safety connected with risk assessment and flexible monitoring is appropriate, but it should be taken into consideration, that water safety should be understood in two dimensions: health (water safety) and technical (water security) and EU legislation must be consistent in this area. It is considered especially as a necessity to taking into account the new regulations of Directive of European Union Parliament and Council 2016/1148 from 6th July 2016 about funds for common high level safety of the network and IT systems in EU area. It should be taken into consideration that The European Council plans to extend the rules included in Directive 2008/114/WE from 8th December 2008 about recognizing and designating critical infrastructure and its needs assessment (ECI), and also Water Supply Plans, regarding to project European Reference Network for Critical Infrastructure Protection (ERNICIP). This wide evaluation system is connected not only with water quality, but also with the state of infrastructure, climate threats, terrorist attacks and extraordinary events serviced by Waterworks.

### Questions/issues

1. How is the problem of water supply system's safety solved in other EU countries? Is the main responsibility taken by the water supplier (water company) or by governmental institutions (environmental protection agencies, sanitary supervision, scientific research facilities)?

2. Are the competences in the other EU countries divided into responsibility for water safety (health safety) and water security (technical aspect)?
3. Is the water supplier responsible only for water supply system's safety in the meaning of threats identification, risk assessment (probability events and its results e.g. environment contamination, failures) that influence on water quality? Or is the water supplier involved in water safety assessment as its influence on human health?

### Protection of critical infrastructure and crisis management

In The Municipal Water and Sewerage Company PLC, for several years attention has been paid to critical infrastructure and its safety. The act on crisis management is the basic tool which is used in case its safety. Increasing requirements in the area of critical infrastructure and preparing procedures in efficient crisis management cause the necessity to include results of new assessment risk and necessity to realize the new project in investment, renovation and organizational areas.

### Questions/issues

1. How is the problem of responsibility for the safety water supply system solved in other EU countries in the context of critical infrastructure?
2. Are there issues of critical infrastrucutre protection and crisis man-  
agement regulated consistently by law or separately?

### City development and resulting from this necessity to uphold existing critical infrastructure.

For several years we have been observing stopping the downward trend in the water production (sale), which is for sure connected with the area development in Cracow and realizing the housing investments.

Following this there are realized investments in the area of developing water distribution system (development of main and neighboring networks and construction of new tanks).

Now the water supply system consists of:

1. 4 surface shots and 1 deep water intake
2. 4 water treatment plants – Bielany, Rudawa, Dłubnia, Raba – total production capacity 314 400 m<sup>3</sup>/d
3. 47 drinking water tanks
4. 23 hydrophores and 3 water pumping stations
5. 2 223 km water supply network

Our biggest water producer for Cracow is Water Treatment Plant Raba in Dobczyce which covers about 60% water demand in the city, using Dobczyce reservoir resources.

Treated water goes to the Cracow network through the tank network in Gorzków and Siercza Part of the water produced in Dobczyce goes to neighboring communes: Dobczyce, Siepraw, Świątniki Górne, Mogilany and Wieliczka.

Because of the dynamic development of Cracow, it is necessary to maintain production capacity based on 4 water treatment plants with particular emphasis on strategic water supply which is Raba. In the future the investment and renovation projects should be continued in case maintaining security and reliability the whole system of water supply (production, distribution, monitoring, protection), with consideration of new threats and security measures.

### Questions/issues

1. How are the issues of reserves of production potential in the field of water supply solved in other EU cuntries?
2. Does the redundant infrastructure exist to maintain a high level of security and reliability of the entire water supply system?
3. Is the redundant infrastructure explored constantly or is it used when need?



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## CITY-IDEA:

# Polish-Dutch Partnership Building, on innovative water solutions

**June 13, 2018, 9.00 AM**  
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### Programme

08.30	<b>Coffee / tea.</b> Registration of Polish and Dutch participants
09.00	<b>Opening by moderator of the day – Edyta Wiśniewska.</b> Welcome, goals of the day, program
09.10	Introduction Round. Presentation of Polish and Dutch participants by Polish and Dutch Group Representatives. Presentation of the OEEs initiative – Prof. Jerzy Hausner
09.30 – 10.15	<b>Case presentations:</b> Explanation of the challenges of the case
	<b>Case 1. Waste water treatment</b>
	Paweł Chudziński, PhD, President and CEO of Aquanet, Ltd. Poznań
	<b>Case 2. Water as a Social Value</b>
	Prof. Zbigniew Kundzewicz, Polish Academy of Science or Prof. Janusz Zaleski, Wrocław Regional Development Agency
	<b>Case 3: Water pricing</b>
	Piotr Ziętała, President and CEO of Kraków Waterworks, Ltd.
10.15	<b>Coffee Break</b>
10.45 – 12.15	<b>Round Tables discussion</b>
12.15 – 12.45	<b>Wrap-up of the cases by the moderators: Krzysztof Głuc, PhD; Mark Niesten; Edyta Wiśniewska</b> Moderators reflect on outcome of discussions, and possibilities for cooperation
12.45 – 13.00	<b>Reflection on the Cases and potential for Cooperation</b> Prof. Jerzy Hausner; Dorota Jopek, PhD
13.00 – 14.00	<b>Polish-Dutch networking lunch</b>